

DOT/FAA/AM-99/19

Office of Aviation Medicine
Washington, D.C. 20591

Follow-up Assessment of The Federal Aviation Administration's Logistics Center Safety Climate

Lydia D. Behn
Richard C. Thompson
Thomas F. Hilton
Federal Aviation Administration
Civil Aeromedical Institute
Oklahoma City, Oklahoma 73125

June 1999

Final Report

This document is available to the public
through the National Technical Information
Service, Springfield, Virginia 22161.



U.S. Department
of Transportation
Federal Aviation
Administration

TIC QUALITY INSPECTED 4

19990714 022

NOTICE

This document is disseminated under the sponsorship of the U.S. Department of Transportation in the interest of information exchange. The United States Government assumes no liability for the contents or use thereof.

Technical Report Documentation Page

1. Report No. DOT/FAA/AM-99/19		2. Government Accession No.		3. Recipient's Catalog No.	
4. Title and Subtitle Follow-Up Assessment of the Federal Aviation Administration's Logistics Center Safety Climate				5. Report Date June, 1999	
				6. Performing Organization Code	
7. Author(s) Behn, L.D., Thompson, R.C., and Hilton, T.F.				8. Performing Organization Report No.	
9. Performing Organization Name and Address FAA Civil Aeromedical Institute P.O. Box 25082 Oklahoma City, OK 73125				10. Work Unit No. (TRIS)	
				11. Contract or Grant No.	
12. Sponsoring Agency name and Address Office of Aviation Medicine Federal Aviation Administration 800 Independence Avenue, S. W. Washington, DC 20591				13. Type of Report and Period Covered	
				14. Sponsoring Agency Code	
15. Supplemental Notes					
16. Abstract <p>This report details FAA Logistics Center employee safety perceptions following the implementation of a safety awareness program. Safety perceptions were baselined in 1992 and a follow-up assessment was conducted in 1995. The purpose of the follow-up survey was to (1) assess differences in perceptions of safety that may have resulted from changes made in the safety program since the 1992 assessment; and (2) determine the managerial and organizational factors that may have impacted those safety perceptions. The present survey was administered to 329 employees (supervisors and non-supervisors) during a mandatory monthly safety meeting. The results show that specific actions intended to demonstrate the importance of safety can lead to higher levels of perceived management and supervisory support for safety. Such practices can also lead to higher levels of perceived safety in the workplace. These practices, however, do not appear to influence perceptions of organizational politics, supervisory fairness, or coworker support for safety.</p>					
17. Key Words Organizational Safety Climate, Employee Perceptions, Logistics Center				18. Distribution Statement Document is available to the public through the National Technical Information Service, Springfield, VA 22161	
19. Security Classif. (of this report) UNCLASSIFIED		20. Security Classif. (of this page) UNCLASSIFIED		21. No. of Pages 25	22. Price

FOLLOW-UP ASSESSMENT OF THE FEDERAL AVIATION ADMINISTRATION'S LOGISTICS CENTER SAFETY CLIMATE

Employee safety is an issue for every organization. Safety regulations influence many aspects of organizational operations. For example, all federal agencies must provide safety training to employees, post information regarding the storage and handling of hazardous materials, and provide equipment to minimize the effects of accidents (i.e., eye wash stations, goggles, etc.). Federal regulations also require the dissemination of information to employees concerning possible workplace hazards. While regulations require organizations to meet certain minimum safety standards, ensuring workforce safety beyond the minimum federal requirements is an organizational decision.

Organizations may choose to exceed federal minimums because investing resources in enhanced safety can reduce potential future costs associated with the results of a hazardous work environment. In 1992 for example, approximately 3.3 million disabling injury accidents attributed to workplace hazards or unsafe conditions were reported (National Safety Council, 1993). Moreover, workplace accidents cost employers approximately 65 million days in lost work time and can drive up the costs of mandated workers' compensation insurance.

Workplace safety hazards derive from characteristics of people, hardware (including all aspects of the physical environment, workplace substances, machinery, and other equipment), and the interaction of the two (DeJoy, 1994). Three main strategies have been utilized to reduce accidents: remove the source of the hazard; protect employees against the consequences of an accidental injury; or reengineer processes and procedures to reduce the probability of an accident. Many organizations have introduced various environmental changes to improve safety, such as posting warning signs, adding or replacing safety equipment, and expanding instruction about safe work behaviors. Organizational programs that are intended to improve safety generally focus on changing individuals' behaviors and modifying equipment (such as installing protective shields and providing

donnable protective devices). Neither of these types of interventions, implemented separately, will produce the desired effect.

Organizations that focus on equipment modifications without regard to other facets of safety may never reach the goal of being as "safe" an organization as possible. For environmental changes to have a lasting effect upon safety, employees must use the equipment correctly and follow procedures consistently. Likewise, only emphasizing employee safety behavior may leave safety goals unattained. To achieve a safe workplace, an organization must have an understanding of the relationship between behavior and safety and the effects the organization may have on that relationship. Without this understanding, the lack of safe behaviors exhibited by employees may leave an organization unable to determine what additions to safety programs are necessary for behavior improvement. Therefore, to more fully understand employee behavior, an organization should take a more comprehensive approach to evaluating safety.

The goal of an effective safety program is to produce a safety-oriented culture in which commonly held values, beliefs, and business practices emphasize and reinforce safety. Before that can happen, a climate of support for safety must be established (Zohar, 1980). However, little research has focused on organizational changes that target an organization's safety climate. Previous safety climate research has generally focused on the number and type of organizational climate dimensions that distinguish "safe" and "unsafe" organizations (Brown & Holmes, 1986; Coyle, Sleeman, & Adams, 1995; Dedobbeleer & Béland, 1991; Zohar, 1980). Hence, prior research has not looked at interventions that may enhance the safety climate of an organization.

An organization's climate is reflected in the employee's perceptions of the workplace (James & Jones, 1974). Climate reflects organizational priorities to employees (Schneider & Rentsch, 1988). Safety climate, then, involves the perceived importance of

safety within an organization. The present study examines the utility of efforts to affect workforce behavior by assessing changes in the organization's climate for safety.

Zohar (1980) was one of the first researchers to focus on safety climate research. He identified eight organizational dimensions believed to encompass safety climate. Zohar's dimensions included: 1) perceived importance of safety training programs; 2) perceived management attitudes toward safety; 3) perceived effects of safe conduct on promotion; 4) perceived level of risk at the work place; 5) perceived effects of required work pace on safety; 6) perceived status of the designated safety officer; 7) perceived effects of safe conduct on social status; and 8) perceived status of the safety committee. The use of four of the eight dimensions (perceived importance of safety training programs, perceived effects of required work pace on safety, perceived status of safety committee, and perceived status of the designated safety officer) was found to be sufficient in discriminating between "safe" and "unsafe" organizations as defined by the number of accidents. In addition to those dimensions, Zohar (1980) found that the degree to which employees perceived that safety was relevant to job behavior, and that management held a positive attitude toward safety discriminated between safe and unsafe organizations. Zohar concluded that perceived management attitudes toward safety were the foundation of an organization's positive safety climate due to its relationship to, and influences upon, the workers' set of ideas about safety.

The importance of management support for safety has been found in several other assessments of safety climate (Brown & Holmes, 1986; Dedobbeleer & Béland, 1991; Coyle, Sleeman, & Adams, 1995). This research suggests that actions taken by management and supervisors to increase perceived support for safety should, in turn, enhance the safety climate of an organization. Such changes should be reflected in increased perceptions of manager and supervisor support for safety, and increased perceptions of safety conditions within the organization. Thus, it is hypothesized that management actions specifically taken to elevate the importance of safety and increase the consistency between stated safety importance and the behaviors of management and supervisors should lead the workforce to perceive greater support for safety in the workplace.

Peers provide another means of judging the importance of safe behavior at work (Bradley, 1995; Cox & Cox, 1991; Zohar, 1980). Most workgroups develop norms for those behaviors that are expected from members of the work group. As such, safety-related behavior may also be influenced by coworkers (Hofmann, Jacobs, & Landy, 1995). Therefore, if a safety program is effective at changing workforce attitudes about safety at work, it is expected that perceptions of coworker support for safety would also increase. The degree to which coworkers support safety in the workplace should also be positively related to an individual's support for safety. Stronger workplace safety norms are likely to be indicated by larger correlations among reported personal support for safety and perceived coworker support for safety.

Given the influence of work group members on safety perceptions, it is possible that any effect of safety change effort is not the same for all groups of employees. Within any organization, there are varying levels of risk for employees in different parts of a facility or facilities (Goldberg, Dar-El, & Rubin, 1991). Employees who work in the office area of a facility may be at less risk for serious injury, compared with those actively working on a factory floor. Given these differences in perceived and actual risk and the differential effectiveness of change programs in general, it is reasonable to predict that management efforts to improve safety will have greater influence on employees in areas where there are greater risks, compared with employees in areas of less risk such as an office environment.

Any organizational change relies on communication from management and supervisors to explain the intended goals and consequences of the effort. In addition, both parties must behave in a manner consistent with the change message if the change is to be effective. One potential problem for any organizational change effort, however, is that management communication is not always taken at face value. Perceived inconsistency between safety communication and safety actions can lead to employees focusing more on actions than on words. Specific safety messages are interpreted by employees in light of the larger organizational context and employees' cognitive dispositions (i.e., attitudes, beliefs, and values). Just because management repeatedly states that safety is important, employees do not necessarily believe that management is highly concerned about safety.

This is especially true in cases where employees are materially rewarded for production, and safety is assumed to be its own reward (Kerr, 1975; Janssens, Brett, & Smith, 1995). Therefore, behaviors that may taint the interpretation of management actions in general, such as political behavior and unfair treatment of employees, may adversely affect the interpretations of some actions directed at improving an organization's safety climate. Thus, it is hypothesized that if employees perceive an increase in management and supervisory support for safety due to actions to increase the status of the organization's safety efforts, there will be a corresponding decrease in perceptions of organizational politics and an increase in perceptions of supervisory fairness.

Perceptual measures of safety conditions are commonly assessed in safety research and correlated with the rates and/or severity of injuries, accidents, and/or incidents. While it is scientifically sound to link attitudes and perceptions to behavioral events, it is seldom practical from the standpoint of improving the safety climate. Such impracticality arises partly because accident/incident data are often unreliably reported and/or recorded; and therefore, correlations between employee perceptions/attitudes and recorded safety incident data may be attenuated. Correlations between safety perceptions and behavioral events can also be minimized because accidents are rare events (Hulin & Rousseau, 1980). When examining rare events, it takes longer to accumulate sufficient samples, thereby delaying the provision of useful feedback.

Given the problems associated with correlations between organizational climate measures and infrequently occurring accident data, the present study examined the relationship between organization climate perceptions and self-report safety perceptions. First, regardless of changes in climate perceptions following the implementation of a safety program, it is hypothesized that there will be a positive relationship between perceptions of manager, supervisor, coworker, and personal support for safety and how positively employees perceive the safety of their environment. Finally, it is expected that there is a negative relationship between perceptions of organizational politics and safety climate, and a positive relationship between supervisor fairness and safety climate.

METHOD

Study Overview

The study was conducted at the FAA Logistics Center located in Oklahoma City. The FAA Logistics Center provides new and replacement parts and equipment for the entire United States air traffic control infrastructure. Logistics Center services include a large warehouse and freight transfer facility; a large repair and fabrication facility with shops that upgrade, repair, or fabricate site-unique mechanical, electrical, and electronic equipment no longer in production; and a large office complex that writes contracts, executes purchase orders, and oversees receiving and shipping in the shops and warehouse.

An earlier baseline climate assessment focused on the factors mentioned previously and included surveys from four organizational levels: employee, supervisory, branch management, and division management. Feedback from the baseline survey was provided to employees and management, and changes in the safety program were initiated. A follow-up survey was conducted three years after the baseline survey to assess changes in climate and safety perceptions.

Safety Program History

The 1992 baseline assessment revealed both strengths and weaknesses in the safety program. Management support for safety was found to be the dimension most related to perceived safety climate. In 1992, less than half (46%) of the respondents indicated that safety was a top organizational priority or that management put safety first, revealing a need for improvement in perceived importance of safety. Less than 40% of respondents indicated that management supported the maintenance of Occupational Safety and Health Administration (OSHA) standards. Perceived supervisor support for safety indicated communication weaknesses between employees and upper management. On the other hand, most employees (68%) perceived their supervisors to be fair in dealing with them. Organizational politics was problematic with 61% of respondents reporting that most employees knew not to "rock the boat," and 43% indicating that it may be "safer to say you agree with management." The results also indicated

moderately strong safety norms, with over half (61%) of the respondents reporting that their coworkers were safety conscious and supportive of safety practices.

To enhance the safety climate, feedback from the baseline survey was provided to Logistics Center employees and management. Action plans were developed based on that feedback. The action plans included: a) activities to improve management and supervisor support for safety, b) new emphasis on making safety training more relevant, and c) effective appointment of a safety officer with the responsibility of promoting safety throughout the Logistics Center. In addition, the existing safety committee was restructured to ensure representation for all three work environments (offices, shops, and warehouse). Safety representatives, who now reported directly to the safety officer, coordinated safety training and other safety activities in the various areas of the center.

Respondents

The baseline survey was administered in 1992 and was completed by 351 of the 507 (69%) FAA Logistics Center employees. The follow-up survey was administered in 1995 during a mandatory monthly safety meeting. Three hundred and twenty-nine (49%) of the 662 employees voluntarily completed the follow-up survey. Table 1 summarizes the sample demographics for the baseline and follow-up surveys. The table presents the respondent's gender and age, as well as tenure and work area in the Logistics Center. For both surveys, those who worked in an office environment were located either within the warehouse or in a separate building comprised entirely of office space.

The demographics of the samples reported in Table 1 did not significantly differ between the baseline and the follow-up survey, with the exception of years of service in the Logistics Center, $\chi^2(5) = 30.84, p < .0001$. The significant difference was due to an increase in the number of 1995 respondents working less than one year on the job. The lifting of a hiring freeze that resulted in the addition of approximately 100 new employees after the baseline survey caused a significant difference in the "less than one year of service" category.

Measures

The organizational and safety climate dimensions and safety issues assessed in the 1995 follow-up survey were taken from the 1992 baseline survey, with some modification in content and format as requested by Logistics Center management. The baseline survey independently assessed the safety perceptions of managers, supervisors, and employees using different surveys. The follow-up survey was shortened to focus on climate changes and to reduce the time and complexity of survey administration. As a result, for the follow-up assessment all personnel were administered the same survey. The follow-up survey assessed nine dimensions: management support for safety, supervisor support for safety, coworker support for safety, personal support for safety, organizational politics, supervisor fairness, safety conditions, safety knowledge confidence, and safety training adequacy. Of the nine dimensions assessed on the follow-up survey, six are directly comparable to the baseline, due to minimal changes in format and content. The remaining three can only be assessed for the follow-up survey, due to significant changes in format or content. The items that make up each dimension can be found in Appendix A, along with item level results.

Management Support for Safety. This measure was comprised of four items developed for the baseline assessment. Management support measured perceptions of managerial support for safety using items concerning management's openness to suggestions from employees (e.g., "Management is open to new ideas on safety issues"), taking an active personal role in safety, and making safety a priority.

Supervisor Support for Safety. This measure was comprised of four items developed for the baseline assessment. Much like management support, supervisor support measured the employees' perceptions of his/her immediate supervisor taking an active role in ensuring safety in the workplace (e.g., "My section supervisor tries to make my job as safe as possible").

Coworker Support for Safety. The three items measuring this dimension were developed for the baseline assessment. Coworker support for safety contained three items measuring the extent to which coworkers were perceived to take safety seriously and coworkers' reactions to the safety precautions taken by others.

Table 1. Sample Demographics for Baseline and Follow-up Surveys

	1992	1995
Gender		
Male	66%	68%
Female	34%	32%
Age in Years		
20 to 29	10%	11%
30 to 39	26%	29%
40 to 49	40%	40%
50 or more	24%	20%
Logistics Center Tenure in Years		
Less than 1	<1%	9%
1 to 3	27%	20%
4 to 10	37%	43%
11 to 15	13%	11%
16 to 20	10%	7%
More than 20	13%	10%
Work Area		
Warehouse	24%	25%
Shops	36%	36%
Office	40%	39%

Personal Support for Safety. Seven items were developed for the baseline assessment of this dimension: items measuring the extent to which an individual took the initiative to acquire safety knowledge, the extent to which the employee informed others on safety matters, and the extent to which an active role was undertaken to ensure a safer work environment were included.

Organizational Politics. Perceptions of organizational politics were measured with four items adapted from the "going along to get ahead" subscale of Kacmar and Ferris (1991). Organizational politics is generally reported to be a negative organizational attribute; therefore, this scale was scored with higher perceptions of organizational politics resulting in lower scale scores (Gandz & Murray, 1980). The dimension included questions about employees' communications with managers, how open the lines of communication were with regard to negative feedback from employees, and management's response to such views.

Supervisor Fairness. Supervisor fairness was measured using four items adapted from Moorman (1991). This dimension addressed issues concerning

perceptions of overall organizational fairness including: fairness in work assignments; employee involvement in the decision-making process; and the level of perceived objectivity of supervisors when dealing with employees.

Safety Conditions. The safety conditions dimension assessed perceptions of the physical conditions of the work environment using eleven items developed for the baseline survey. Topics addressed the perceived presence of safety hazards or unsafe conditions (e.g., "Aisles/passageways and working areas are free of tripping hazards"), and the proper dissemination and posting of safety-related information.

Safety Knowledge Confidence. The safety knowledge confidence section differed in format from the previous survey. The baseline survey format included open-ended questions that required the respondents to give an essay-type answer to determine if, for instance, they actually knew where to find an eye wash station in their immediate work area. The current survey assessed respondent confidence in his/her knowledge regarding five health and safety issues. Most of the questions concerned knowledge usually required for a more industrial environment. However,

knowledge of industrial safety is needed by all Logistic Center employees due to the close proximity of office employees' work spaces to the more industrial environment of the Logistics Center and the presence of office employees in the warehouse and shops.

Safety Training Adequacy. This dimension was assessed with a single item that asked respondents to rate the adequacy of safety training they had received in the previous 12 months.

RESULTS

The means and standard deviations for all of the study measures are summarized in Table 2. Descriptive statistics for both survey administrations, as well as internal consistency reliability estimates for each of the study measures, are included in the table.

To examine the set of hypotheses regarding changes in climate perceptions following the implementation of changes to the Logistics Center Safety Program, a Multivariate Analyses of Variance (MANOVA) was conducted. Due to confidentiality concerns pairwise or matched case comparisons were not possible. Samples were, therefore, treated as independent. Six dimensions that were measured on both surveys were compared. The results of the MANOVA indicated significant differences between survey administrations for at least one of the six climate dimensions, $F(6,617) = 23.26, p < .001$. Therefore, follow-up one way Analyses of Variance (ANOVA) were conducted for each of the six climate dimensions.

The results of these analyses are summarized in Table 2. As can be seen in the table, the predicted improvement in perceptions of manager and supervisor support for safety was found, $F(1, 622) = 82.91 p < .001$, and $F(1, 622) = 11.02 p < .001$, respectively. As such, it appears that the actions taken to improve the safety program of the Logistics Center led to respondents perceiving greater support for safety. The next hypothesis, the expected change in perceptions of coworker support for safety, was not supported. The means for the two surveys, shown in Table 2, indicate there was no change in perceptions for this dimension.

Given the finding of improvement in perceptions of manager and supervisor support for safety, the next analyses focused on changes in perceptions of organizational politics and supervisory fairness perceptions. The results for these analyses, also summarized in Table 2, show there were no changes in perceptions of these dimensions. Thus, it is concluded that improvements in safety behavior do not seem to influence these broader organizational climate dimensions.

The final overall baseline/follow-up comparison, and perhaps the most important for the present study, is the change in perceptions of safety conditions following the change program. Table 2 shows that there was a significant increase in the level of perceived safety conditions in the Logistics Center, $F(1, 622) = 8.22 p < .001$. However, this improvement was small ($n^2 = .01$).

Table 2. Dimension Descriptive Statistics

	1992 (n = 351)			1995 (n = 325)			F- values
	Mean	SD	Reliability Estimate	Mean	SD	Reliability Estimate	
Management Support for Safety	3.18	0.75	.81	3.67	0.66	.74	82.909*
Supervisor Support for Safety	3.62	0.82	.79	3.81	0.70	.85	11.022*
Coworker Support for Safety	3.67	0.77	.56	3.60	0.77	.76	1.386
Personal Support for Safety	NA	NA	NA	3.33	0.62	NA	NA
Organizational Politics	3.13	0.96	.87	3.04	0.94	.90	2.554
Supervisory Fairness	3.58	1.07	.72	3.71	0.96	.82	2.560
Safety Conditions	3.35	0.68	.83	3.47	0.53	.82	8.219*
Safety Knowledge Confidence	NA	NA	NA	3.60	1.16	NA	NA
Safety Training Adequacy	NA	NA	NA	3.68	0.89	NA	NA

* $p < .001$

To test the relational hypotheses, Pearson Product Moment correlations were computed separately for the measures from both surveys. These correlations are summarized in Table 3. The first correlational hypothesis tested the assumption that there would be a significant correlation among coworker and personal support for safety. This hypothesis was not supported, $r(319) = .17, p < .001$. Although there was a significant relationship between these dimensions, it is a small to medium correlation (Cohen, 1992). This result suggests that, while the relationship is statistically significant, there is only a weak relationship between coworker and personal support for safety.

The next set of correlational hypotheses proposed relationships between organizational climate perceptions and self-report indicators of workplace safety. Correlations for all available measures are summarized in Table 3. The table shows that on the baseline survey there were sizable correlations between perceptions of safety conditions and management, supervisor, and coworker support for safety. Similarly, for the follow-up survey, there were similar correlations, although slightly smaller. These results support the contention that there is a relationship between perceptions of safety conditions and organizational climate perceptions. The correlations of climate dimensions with safety knowledge confidence are either nonsignificant (management, supervisor, and coworker support for safety) or small. The largest correlation for safety knowledge confidence occurs with personal support for safety, suggesting that

those respondents who are more safety oriented likewise have more confidence in their safety knowledge. On the other hand, adequacy of safety training is unrelated to personal support for safety, but is moderately correlated with the other support measures and safety conditions. On the whole, these results suggest that personal support for safety is independent of many organizational influences.

Another set of correlational hypotheses dealt with relationships between safety conditions and organizational politics and supervisory fairness. Table 3 shows that organizational politics is negatively related to safety conditions for both survey administrations. Further, the results indicate that supervisory fairness perceptions are positively related to safety conditions for both administrations.

In addition, Table 3 shows that on the follow-up survey there was a moderate correlation among ratings of safety conditions and safety knowledge confidence ($r = .43$). This result suggests that respondents who perceive greater safety in the workplace are more confident in their safety knowledge. There was no relationship, however, among safety conditions and safety training adequacy. Likewise, there was no relationship between confidence in safety knowledge and safety training adequacy.

The final set of analyses (Table 4) examined the differential effect of the safety program changes on the various work areas of the logistics center. There were no a priori hypotheses for these analyses, and therefore, they should be treated as exploratory. Here,

Table 3. Dimension Intercorrelations

Dimensions	Correlations								
	1	2	3	4	5	6	7	8	9
1. Management Support for Safety	--	.65**	.40**	.11	-.53**	.51**	.52**	.09	.28**
2. Supervisor Support for Safety	.68**	--	.42**	.11	-.44**	.64**	.46**	.09	.21**
3. Coworker Support for Safety	.43**	.46**	--	.17**	-.24**	.35**	.57**	.08	.27**
4. Personal Support for Safety	NA	NA	NA	--	-.13*	.13*	.02	.28**	.01
5. Organizational Politics	-.65**	-.54**	-.33**	NA	--	-.48**	-.34**	-.14*	-.19**
6. Supervisory Fairness	.54**	.69**	.39**	NA	-.52**	--	.40**	.17**	.28**
7. Safety Conditions	.68**	.68**	.53**	NA	-.51**	.54**	--	.04	.43**
8. Safety Knowledge Confidence	NA	NA	NA	NA	NA	NA	NA	--	.07
9. Safety Training Adequacy	NA	NA	NA	NA	NA	NA	NA	NA	--

1995 correlations above diagonal, 1992 correlations below diagonal.

*Correlation is significant at the 0.05 level (2-tailed).

** Correlation is significant at the 0.01 level (2-tailed).

Table 4. Dimension Descriptive Statistics by Survey Administration and Work Environment.

	1992			1995									F-Values		
	Warehouse (N = 73)		Shops (N = 113)		Office (N = 124)		Warehouse (N = 79)		Shops (N = 115)		Office (N = 125)		Year	Work Area	Year X Work Area
	Mean	SD	Mean	SD	Mean	SD	Mean	SD	Mean	SD	Mean	SD			
Management Support for Safety	2.88	0.77	3.28	0.73	3.23	0.77	3.31	0.43	3.37	0.50	3.37	0.38	87.540*	4.754*	3.284*
Supervisor Support for Safety	3.39	0.58	3.48	0.51	3.51	0.57	3.75	0.67	3.81	0.77	3.84	0.66	9.494*	1.010	.790
Coworker Support for Safety	3.50	0.85	3.82	0.77	3.68	0.73	3.55	0.76	3.59	0.83	3.65	0.68	1.024	2.553	1.753
Organizational Politics	3.49	0.90	2.87	0.94	3.09	0.96	2.64	1.05	3.06	1.10	2.51	1.04	3.819	9.561*	3.686*
Supervisory Fairness	3.37	1.07	3.63	0.94	3.61	1.19	3.74	0.98	3.79	0.92	3.60	1.03	3.715	.713	2.041
Safety Conditions	3.14	0.72	3.39	0.69	3.45	0.63	3.38	0.55	3.41	0.53	3.61	0.47	8.065*	11.315*	.908

* p < .05

a 2 (year: first and second survey administration) by 3 (work area: Office, Shops, Warehouse) MANOVA was calculated. This test showed there were significant main effects of survey administration, $F(6,569) = 23.84, p < .001$; work area, $F(12,1140) = 5.05, p < .001$; and the interaction, $F(12,1140) = 1.94, p < .03$. These omnibus tests indicate that follow-up analyses for each dependent variable were appropriate. These follow-up analyses are summarized in Table 4.

An examination of Table 4 shows that the only dependent variable with a significant main effect that was not tempered by a significant interaction was for supervisor support for safety, $F(1,575) = 9.94, p < .002$. An examination of the means shows that, for each of the three work areas, perceptions of supervisor support for safety increased.

Perceptions of organizational politics decreased, as expected, in the warehouse and the office, but increased in the shops, which led to a significant interaction for this dimension, $F(2,574) = 3.69, p < .03$. It is likely that the nature of these changes, with decreases in two areas and an increase in another, contributed to the lack of a main effect for survey administration. Post hoc analyses, collapsing across survey administrations, show that the level of politics was lower overall in the shops area, compared with the warehouse and the office. This initial low score for politics makes it more difficult to reduce, due to a "floor" effect.

Perceptions of management support for safety improved over the initial survey results, as indicated by the significant main effect. In addition, there was a main effect for work area, with the shops being significantly higher, compared with the warehouse, and no difference for the offices. These main effects, however, are tempered by a significant time by work area interaction. An examination of the means indicates that the improvement in the warehouse area outpaces the other two, which yields the interaction.

Finally, there was a safety condition main effect for both survey administration and for work area. The means in Table 3 indicate that perceptions of safety conditions improved over that of the initial survey and that the shops and office were significantly different in terms of the reported level of safety conditions.

DISCUSSION

Before discussing the implications of the present research, it is necessary to discuss several caveats. First, although the data were collected on two separate occasions, all the data were collected using paper and pencil surveys. This reliance on surveys can lead to relationships among variables that are influenced by mono-method bias. In addition, the statistical comparisons based on survey administrations were conducted as analyses of independent groups instead of some form of repeated measures. Such analyses can underestimate the degree of difference between the groups because, instead of controlling some variance due to individual variability this variance is in the error term, which makes it less likely a statistically significant difference will be found.

Nonetheless, the results from this study suggest that, when an organization's managers and supervisors take actions (based on research evidence) that are intended to improve the safety climate of the organization, there are positive results. Specifically, by improving the coordination of the safety program and elevating the status of the safety officer, as suggested by Zohar (1980) and others, the FAA's Logistics Center was able to improve employee perceptions of management and supervisor support for safety, as well as perceptions of safety conditions within the Center. These results provide evidence that a concentrated effort for improvement can be effective.

These actions did not, however, improve the Logistics Center employees' perceptions of organizational politics, supervisory fairness, or coworker support for safety. It is possible that improvements in safety related perceptions were unable to improve the broader organizational climate perceptions for the Center as a whole. Past research has demonstrated that the broader organizational perceptions indirectly influence safety climate perceptions (Thompson, Hilton, & Witt, 1998).

The results also suggest that personal support for safety is largely independent of management, supervisor, and coworker support for safety. Similarly, these perceptions are independent of perceived safety conditions of the workplace and the adequacy of

safety training. On the other hand, there is a sizeable correlation between personal support for safety and confidence in training knowledge. This finding suggests that persons who are more interested in safety take the effort to know safety precautions, and hence are more confident about the safety-related components of their job. Of course, the correlational nature of these results preclude a causal assessment of this hypothesis, so it should be addressed in future research. Related to this finding, individual ratings of their confidence in safety knowledge also appear to be independent of perceptions of safety conditions and adequacy of safety training. Future research should examine this relationship, as well as methods of increasing an individual's concern and support for his/her personal safety.

REFERENCES

- Bradley, G. L. (1995). Group influences upon preferences for personal protection: A simulation study. *Journal of Safety Research*, *26*, 99-105.
- Brown, R. L., and Holmes, H. (1986). The use of a factor analytic procedure for assessing the validity of an employee safety climate model. *Accident Analysis & Prevention*, *18*, 445-70.
- Cohen, J. (1992). A power primer. *Psychological Bulletin*, *112*, 155-9.
- Cox, S., and Cox, T. (1991). The structure of employee attitudes towards safety: A European example. *Work & Stress*, *5*, 93-106.
- Coyle, I. R., Sleeman, S. D., and Adams, N. (1995). Safety climate. *Journal of Safety Research*, *26*, 247-54.
- Dedobbeleer, N., and Béland, F. (1991). A safety climate measure for construction sites. *Journal of Safety Research*, *22*, 97-103.
- DeJoy, D. M. (1994). Managing safety in the workplace: An attribution theory analysis and model. *Journal of Safety Research*, *25*, 3-17.
- Gandz, J., and Murray, V. V. (1980). The experience of workplace politics. *Academy of Management Review*, *23*, 237-51.
- Goldberg, A. I., Dar-El, E., and Rubin, R. E. (1991). Threat perception and the readiness to participate in safety programs. *Journal of Organizational Behavior*, *12*, 109-22.
- Hofmann, D. A., Jacobs, R., and Landy, F. (1995). High reliability process industries: Individual, micro, and macro organizational influences on safety performance. *Journal of Safety Research*, *26*, 131-49.
- Hulin, C. L., and Rousseau, D. M. (1980). Analyzing infrequent events: Once you find them, your troubles begin. In K. Roberts and L. Burstein (Eds.), *Issues in aggregation* (pp. 65-75). San Francisco, CA: Jossey-Bass.
- James, L. R., and Jones, A. P. (1974). Organizational climate: A review of theory and research. *Psychological Bulletin*, *81*, 1096-1112.
- Janssens, M., Brett, J. M., and Smith, F. (1995). Confirmatory cross-cultural research: Testing the viability of a corporation-wide safety policy. *Academy of Management Journal*, *38*, 364-82.
- Kacmar, K. M., and Ferris, G. R. (1991). Perceptions of organizational politics scale (POPS): Development and construct validation. *Educational and Psychological Measurement*, *51*, 193-205.
- Kerr, S. (1975). On the folly of rewarding A, while hoping for B. *Academy of Management Review*, *18*, 769-83.
- Moorman, R. H. (1991). Relationship between organizational justice and organizational citizenship behaviors: Do fairness perceptions influence employee citizenship? *Journal of Applied Psychology*, *76*, 845-55.
- National Safety Council (1993). *Accident facts*. Itasca, IL: Author.
- Schneider, B., and Rentsch, J. (1988). Managing climates and cultures: A futures perspective. In J. Hage (Ed.), *Futures of organizations: Innovating to adapt strategy and human resources to rapid technological change* (pp. 181-200). Lexington, MA: Lexington Books.
- Thompson, R. C., Hilton, T. F., and Witt, L. A. (1998). Where the safety rubber meets the shop floor: A confirmatory model of management influence on safety. *Journal of Safety Research*, *29*, 15-24.
- Zohar, D. (1980). Safety climate in industrial organizations: Theoretical and applied implications. *Journal of Applied Psychology*, *65*, 96-102.

**Appendix A:
Item Analysis for the 1995 Safety Survey**

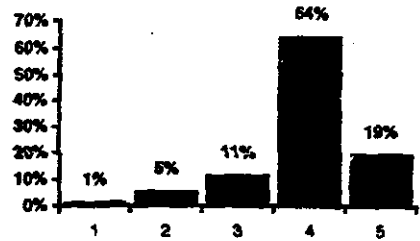
Management Support for Safety¹

Item	Mean	StdDev	Response Distribution												
Management is open to new ideas on safety issues.	3.79	.79	<table border="1"> <tr><th>Response</th><td>1</td><td>2</td><td>3</td><td>4</td><td>5</td></tr> <tr><th>Percentage</th><td>1%</td><td>5%</td><td>24%</td><td>55%</td><td>15%</td></tr> </table>	Response	1	2	3	4	5	Percentage	1%	5%	24%	55%	15%
Response	1	2	3	4	5										
Percentage	1%	5%	24%	55%	15%										
Management only pays "lip service" to OSHA regulations.	3.46	.95	<table border="1"> <tr><th>Response</th><td>1</td><td>2</td><td>3</td><td>4</td><td>5</td></tr> <tr><th>Percentage</th><td>12%</td><td>41%</td><td>33%</td><td>12%</td><td>18%</td></tr> </table>	Response	1	2	3	4	5	Percentage	12%	41%	33%	12%	18%
Response	1	2	3	4	5										
Percentage	12%	41%	33%	12%	18%										
Management takes action to correct safety problems when brought to their attention.	3.80	.83	<table border="1"> <tr><th>Response</th><td>1</td><td>2</td><td>3</td><td>4</td><td>5</td></tr> <tr><th>Percentage</th><td>1%</td><td>8%</td><td>18%</td><td>61%</td><td>18%</td></tr> </table>	Response	1	2	3	4	5	Percentage	1%	8%	18%	61%	18%
Response	1	2	3	4	5										
Percentage	1%	8%	18%	61%	18%										
Management puts the job before the safety of its employees.	3.65	.95	<table border="1"> <tr><th>Response</th><td>1</td><td>2</td><td>3</td><td>4</td><td>5</td></tr> <tr><th>Percentage</th><td>15%</td><td>51%</td><td>20%</td><td>12%</td><td>2%</td></tr> </table>	Response	1	2	3	4	5	Percentage	15%	51%	20%	12%	2%
Response	1	2	3	4	5										
Percentage	15%	51%	20%	12%	2%										

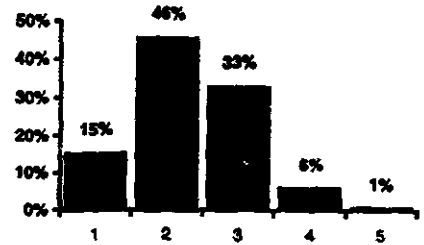
¹ Percentages may not sum to 100% due to rounding; response options are: 1 = Strongly Disagree, 2 = Disagree, 3 = Unsure, 4 = Agree, and 5 = Strongly Agree.

Supervisor Support for Safety²

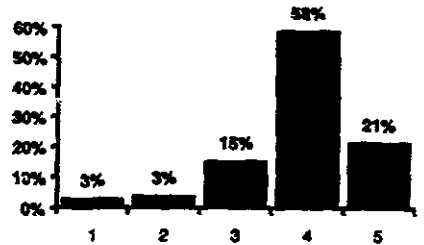
My section supervisor tries to make my job as safe as possible. 3.95 .76



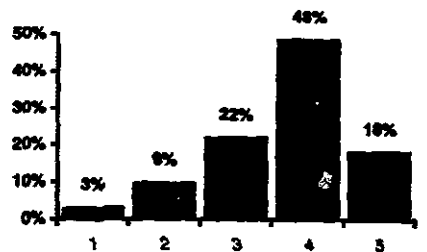
My supervisor seldom tells management about unsafe situations. 3.69 .82



My supervisor shows personal concern about employee safety. 3.91 .85



My supervisor places worker safety as a top priority. 3.69 .96



² Percentages may not sum to 100% due to rounding; response options are: 1 = Strongly Disagree, 2 = Disagree, 3 = Unsure, 4 = Agree, and 5 = Strongly Agree.

Coworker Support of Safety³

Item	Mean	StdDev	Response Distribution												
Most of my coworkers take safety very seriously.	3.58	.95	<table border="1" style="display: none;"> <caption>Response Distribution Data</caption> <thead> <tr><th>Response</th><th>Percentage</th></tr> </thead> <tbody> <tr><td>1</td><td>3%</td></tr> <tr><td>2</td><td>15%</td></tr> <tr><td>3</td><td>17%</td></tr> <tr><td>4</td><td>55%</td></tr> <tr><td>5</td><td>11%</td></tr> </tbody> </table>	Response	Percentage	1	3%	2	15%	3	17%	4	55%	5	11%
Response	Percentage														
1	3%														
2	15%														
3	17%														
4	55%														
5	11%														
Most of my coworkers are quick to point out unsafe conditions.	3.51	.93	<table border="1" style="display: none;"> <caption>Response Distribution Data</caption> <thead> <tr><th>Response</th><th>Percentage</th></tr> </thead> <tbody> <tr><td>1</td><td>3%</td></tr> <tr><td>2</td><td>16%</td></tr> <tr><td>3</td><td>21%</td></tr> <tr><td>4</td><td>53%</td></tr> <tr><td>5</td><td>9%</td></tr> </tbody> </table>	Response	Percentage	1	3%	2	16%	3	21%	4	53%	5	9%
Response	Percentage														
1	3%														
2	16%														
3	21%														
4	53%														
5	9%														
Some of my coworkers will make fun of me if I use safety protection.	3.69	.94	<table border="1" style="display: none;"> <caption>Response Distribution Data</caption> <thead> <tr><th>Response</th><th>Percentage</th></tr> </thead> <tbody> <tr><td>1</td><td>16%</td></tr> <tr><td>2</td><td>58%</td></tr> <tr><td>3</td><td>16%</td></tr> <tr><td>4</td><td>12%</td></tr> <tr><td>5</td><td>2%</td></tr> </tbody> </table>	Response	Percentage	1	16%	2	58%	3	16%	4	12%	5	2%
Response	Percentage														
1	16%														
2	58%														
3	16%														
4	12%														
5	2%														

³ Percentages may not sum to 100% due to rounding; response options are: 1 = Strongly Disagree, 2 = Disagree, 3 = Unsure, 4 = Agree, and 5 = Strongly Agree.

Personal Support of Safety⁴

Item	Mean	StdDev	Response Distribution												
<p>Within the last six months, I have notified a member of management, a member of the safety committee, or a union representative that OSHA regulations have been violated.</p>	2.17	.95	<table border="1" style="margin: 0 auto; font-size: small;"> <caption>Response Distribution Data (Item 1)</caption> <tr><th>Response</th><th>Percentage</th></tr> <tr><td>1</td><td>21%</td></tr> <tr><td>2</td><td>58%</td></tr> <tr><td>3</td><td>12%</td></tr> <tr><td>4</td><td>8%</td></tr> <tr><td>5</td><td>3%</td></tr> </table>	Response	Percentage	1	21%	2	58%	3	12%	4	8%	5	3%
Response	Percentage														
1	21%														
2	58%														
3	12%														
4	8%														
5	3%														
<p>Within the last six months, I have cleared away tripping hazards.</p>	3.53	1.01	<table border="1" style="margin: 0 auto; font-size: small;"> <caption>Response Distribution Data (Item 2)</caption> <tr><th>Response</th><th>Percentage</th></tr> <tr><td>1</td><td>4%</td></tr> <tr><td>2</td><td>19%</td></tr> <tr><td>3</td><td>8%</td></tr> <tr><td>4</td><td>62%</td></tr> <tr><td>5</td><td>8%</td></tr> </table>	Response	Percentage	1	4%	2	19%	3	8%	4	62%	5	8%
Response	Percentage														
1	4%														
2	19%														
3	8%														
4	62%														
5	8%														
<p>Within the last six month I have informed a member of management, a member of the safety committee, or a union representative about an unsafe condition.</p>	2.71	1.20	<table border="1" style="margin: 0 auto; font-size: small;"> <caption>Response Distribution Data (Item 3)</caption> <tr><th>Response</th><th>Percentage</th></tr> <tr><td>1</td><td>16%</td></tr> <tr><td>2</td><td>38%</td></tr> <tr><td>3</td><td>13%</td></tr> <tr><td>4</td><td>28%</td></tr> <tr><td>5</td><td>8%</td></tr> </table>	Response	Percentage	1	16%	2	38%	3	13%	4	28%	5	8%
Response	Percentage														
1	16%														
2	38%														
3	13%														
4	28%														
5	8%														
<p>Within the last six months, I have talked about safety issues with coworkers.</p>	3.59	1.04	<table border="1" style="margin: 0 auto; font-size: small;"> <caption>Response Distribution Data (Item 4)</caption> <tr><th>Response</th><th>Percentage</th></tr> <tr><td>1</td><td>4%</td></tr> <tr><td>2</td><td>17%</td></tr> <tr><td>3</td><td>7%</td></tr> <tr><td>4</td><td>68%</td></tr> <tr><td>5</td><td>13%</td></tr> </table>	Response	Percentage	1	4%	2	17%	3	7%	4	68%	5	13%
Response	Percentage														
1	4%														
2	17%														
3	7%														
4	68%														
5	13%														

⁴ Percentages may not sum to 100% due to rounding; response options are: 1 = Strongly Disagree, 2 = Disagree, 3 = Unsure, 4 = Agree, and 5 = Strongly Agree.

Personal Support of Safety⁵ (continued)

Item	Mean	StdDev	Response Distribution												
<p>Within the last six months, I have helped others to maintain safe work practices.</p>	3.56	1.01	<table border="1" style="display: none;"> <caption>Response Distribution for Item 1</caption> <thead> <tr><th>Response</th><th>Percentage</th></tr> </thead> <tbody> <tr><td>1</td><td>4%</td></tr> <tr><td>2</td><td>15%</td></tr> <tr><td>3</td><td>13%</td></tr> <tr><td>4</td><td>58%</td></tr> <tr><td>5</td><td>11%</td></tr> </tbody> </table>	Response	Percentage	1	4%	2	15%	3	13%	4	58%	5	11%
Response	Percentage														
1	4%														
2	15%														
3	13%														
4	58%														
5	11%														
<p>Within the last six months, I have made myself familiar with safety related information.</p>	3.74	.89	<table border="1" style="display: none;"> <caption>Response Distribution for Item 2</caption> <thead> <tr><th>Response</th><th>Percentage</th></tr> </thead> <tbody> <tr><td>1</td><td>3%</td></tr> <tr><td>2</td><td>9%</td></tr> <tr><td>3</td><td>11%</td></tr> <tr><td>4</td><td>68%</td></tr> <tr><td>5</td><td>12%</td></tr> </tbody> </table>	Response	Percentage	1	3%	2	9%	3	11%	4	68%	5	12%
Response	Percentage														
1	3%														
2	9%														
3	11%														
4	68%														
5	12%														
<p>Within the last six months, I have personally maintained safe work practices.</p>	4.01	.60	<table border="1" style="display: none;"> <caption>Response Distribution for Item 3</caption> <thead> <tr><th>Response</th><th>Percentage</th></tr> </thead> <tbody> <tr><td>1</td><td>1%</td></tr> <tr><td>2</td><td>2%</td></tr> <tr><td>3</td><td>6%</td></tr> <tr><td>4</td><td>78%</td></tr> <tr><td>5</td><td>14%</td></tr> </tbody> </table>	Response	Percentage	1	1%	2	2%	3	6%	4	78%	5	14%
Response	Percentage														
1	1%														
2	2%														
3	6%														
4	78%														
5	14%														

⁵ Percentages may not sum to 100% due to rounding; response options are: 1 = Strongly Disagree, 2 = Disagree, 3 = Unsure, 4 = Agree, and 5 = Strongly Agree.

Organizational Politics⁶

Item	Mean	StdDev	Response Distribution												
Some employees may hesitate to speak up for fear of retaliation.	3.37	1.18	<table border="1"> <caption>Response Distribution Data</caption> <thead> <tr> <th>Response Option</th> <th>Percentage</th> </tr> </thead> <tbody> <tr><td>1</td><td>8%</td></tr> <tr><td>2</td><td>20%</td></tr> <tr><td>3</td><td>14%</td></tr> <tr><td>4</td><td>44%</td></tr> <tr><td>5</td><td>0%</td></tr> </tbody> </table>	Response Option	Percentage	1	8%	2	20%	3	14%	4	44%	5	0%
Response Option	Percentage														
1	8%														
2	20%														
3	14%														
4	44%														
5	0%														
It is generally safer to "say you agree" with management than to say what you think is right.	3.14	1.19	<table border="1"> <caption>Response Distribution Data</caption> <thead> <tr> <th>Response Option</th> <th>Percentage</th> </tr> </thead> <tbody> <tr><td>1</td><td>7%</td></tr> <tr><td>2</td><td>33%</td></tr> <tr><td>3</td><td>14%</td></tr> <tr><td>4</td><td>35%</td></tr> <tr><td>5</td><td>16%</td></tr> </tbody> </table>	Response Option	Percentage	1	7%	2	33%	3	14%	4	35%	5	16%
Response Option	Percentage														
1	7%														
2	33%														
3	14%														
4	35%														
5	16%														
We are encouraged to express our concerns openly.	3.60	0.97	<table border="1"> <caption>Response Distribution Data</caption> <thead> <tr> <th>Response Option</th> <th>Percentage</th> </tr> </thead> <tbody> <tr><td>1</td><td>3%</td></tr> <tr><td>2</td><td>14%</td></tr> <tr><td>3</td><td>15%</td></tr> <tr><td>4</td><td>57%</td></tr> <tr><td>5</td><td>12%</td></tr> </tbody> </table>	Response Option	Percentage	1	3%	2	14%	3	15%	4	57%	5	12%
Response Option	Percentage														
1	3%														
2	14%														
3	15%														
4	57%														
5	12%														
Management officially encourages open communication, but, in reality, most people know not to "upset the apple cart: or "rock the boat."	3.25	1.26	<table border="1"> <caption>Response Distribution Data</caption> <thead> <tr> <th>Response Option</th> <th>Percentage</th> </tr> </thead> <tbody> <tr><td>1</td><td>10%</td></tr> <tr><td>2</td><td>26%</td></tr> <tr><td>3</td><td>11%</td></tr> <tr><td>4</td><td>37%</td></tr> <tr><td>5</td><td>16%</td></tr> </tbody> </table>	Response Option	Percentage	1	10%	2	26%	3	11%	4	37%	5	16%
Response Option	Percentage														
1	10%														
2	26%														
3	11%														
4	37%														
5	16%														

⁶ Percentages may not sum to 100% due to rounding; response options are: 1 = Strongly Disagree, 2 = Disagree, 3 = Unsure, 4 = Agree, and 5 = Strongly Agree.

Supervisor Fairness⁷

Item	Mean	StdDev	Response Distribution												
When dealing with me, my supervisor has been able to suppress his/her biases and has almost always treated me fairly.	3.80	1.11	<table border="1"> <caption>Response Distribution Data for Item 1</caption> <thead> <tr><th>Response</th><th>Percentage</th></tr> </thead> <tbody> <tr><td>1</td><td>4%</td></tr> <tr><td>2</td><td>11%</td></tr> <tr><td>3</td><td>10%</td></tr> <tr><td>4</td><td>53%</td></tr> <tr><td>5</td><td>22%</td></tr> </tbody> </table>	Response	Percentage	1	4%	2	11%	3	10%	4	53%	5	22%
Response	Percentage														
1	4%														
2	11%														
3	10%														
4	53%														
5	22%														
My supervisor has been fair in making my job assignments.	3.79	1.04	<table border="1"> <caption>Response Distribution Data for Item 2</caption> <thead> <tr><th>Response</th><th>Percentage</th></tr> </thead> <tbody> <tr><td>1</td><td>5%</td></tr> <tr><td>2</td><td>13%</td></tr> <tr><td>3</td><td>19%</td></tr> <tr><td>4</td><td>43%</td></tr> <tr><td>5</td><td>18%</td></tr> </tbody> </table>	Response	Percentage	1	5%	2	13%	3	19%	4	43%	5	18%
Response	Percentage														
1	5%														
2	13%														
3	19%														
4	43%														
5	18%														
My supervisor considers my viewpoint when making decisions that affect me.	3.60	1.10	<table border="1"> <caption>Response Distribution Data for Item 3</caption> <thead> <tr><th>Response</th><th>Percentage</th></tr> </thead> <tbody> <tr><td>1</td><td>8%</td></tr> <tr><td>2</td><td>11%</td></tr> <tr><td>3</td><td>18%</td></tr> <tr><td>4</td><td>43%</td></tr> <tr><td>5</td><td>18%</td></tr> </tbody> </table>	Response	Percentage	1	8%	2	11%	3	18%	4	43%	5	18%
Response	Percentage														
1	8%														
2	11%														
3	18%														
4	43%														
5	18%														
In making decisions that affect my pay and promotability, my supervisor has been fair.	3.61	1.18	<table border="1"> <caption>Response Distribution Data for Item 4</caption> <thead> <tr><th>Response</th><th>Percentage</th></tr> </thead> <tbody> <tr><td>1</td><td>8%</td></tr> <tr><td>2</td><td>11%</td></tr> <tr><td>3</td><td>18%</td></tr> <tr><td>4</td><td>43%</td></tr> <tr><td>5</td><td>23%</td></tr> </tbody> </table>	Response	Percentage	1	8%	2	11%	3	18%	4	43%	5	23%
Response	Percentage														
1	8%														
2	11%														
3	18%														
4	43%														
5	23%														

⁷ Percentages may not sum to 100% due to rounding; response options are: 1 = Strongly Disagree, 2 = Disagree, 3 = Unsure, 4 = Agree, and 5 = Strongly Agree.

Safety Conditions⁸

Item	Mean	StdDev	Response Distribution												
First aid and safety equipment are maintained in good working order.	3.68	0.84	<table border="1"> <caption>Response Distribution Data</caption> <thead> <tr> <th>Response Option</th> <th>Percentage</th> </tr> </thead> <tbody> <tr><td>1</td><td>2%</td></tr> <tr><td>2</td><td>8%</td></tr> <tr><td>3</td><td>23%</td></tr> <tr><td>4</td><td>57%</td></tr> <tr><td>5</td><td>11%</td></tr> </tbody> </table>	Response Option	Percentage	1	2%	2	8%	3	23%	4	57%	5	11%
Response Option	Percentage														
1	2%														
2	8%														
3	23%														
4	57%														
5	11%														
Most of the people in my workgroup believe it is essential that all employees use safety equipment on the job (i.e., glasses, gloves, shoes, etc.).	3.56	0.87	<table border="1"> <caption>Response Distribution Data</caption> <thead> <tr> <th>Response Option</th> <th>Percentage</th> </tr> </thead> <tbody> <tr><td>1</td><td>2%</td></tr> <tr><td>2</td><td>10%</td></tr> <tr><td>3</td><td>28%</td></tr> <tr><td>4</td><td>54%</td></tr> <tr><td>5</td><td>8%</td></tr> </tbody> </table>	Response Option	Percentage	1	2%	2	10%	3	28%	4	54%	5	8%
Response Option	Percentage														
1	2%														
2	10%														
3	28%														
4	54%														
5	8%														
Aisles/passageways and working areas are free of tripping hazards.	3.24	1.03	<table border="1"> <caption>Response Distribution Data</caption> <thead> <tr> <th>Response Option</th> <th>Percentage</th> </tr> </thead> <tbody> <tr><td>1</td><td>5%</td></tr> <tr><td>2</td><td>27%</td></tr> <tr><td>3</td><td>11%</td></tr> <tr><td>4</td><td>54%</td></tr> <tr><td>5</td><td>3%</td></tr> </tbody> </table>	Response Option	Percentage	1	5%	2	27%	3	11%	4	54%	5	3%
Response Option	Percentage														
1	5%														
2	27%														
3	11%														
4	54%														
5	3%														
Information mandated by OSHA is posted and updated regularly.	3.25	0.87	<table border="1"> <caption>Response Distribution Data</caption> <thead> <tr> <th>Response Option</th> <th>Percentage</th> </tr> </thead> <tbody> <tr><td>1</td><td>3%</td></tr> <tr><td>2</td><td>14%</td></tr> <tr><td>3</td><td>43%</td></tr> <tr><td>4</td><td>38%</td></tr> <tr><td>5</td><td>8%</td></tr> </tbody> </table>	Response Option	Percentage	1	3%	2	14%	3	43%	4	38%	5	8%
Response Option	Percentage														
1	3%														
2	14%														
3	43%														
4	38%														
5	8%														

⁸ Percentages may not sum to 100% due to rounding; response options are: 1 = Strongly Disagree, 2 = Disagree, 3 = Unsure, 4 = Agree, and 5 = Strongly Agree.

Safety Conditions⁹ (continued)

Item	Mean	StdDev	Response Distribution												
Hazardous materials and stations are clearly marked.	3.65	0.73	<table border="1"> <caption>Response Distribution Data</caption> <thead> <tr> <th>Response Option</th> <th>Percentage</th> </tr> </thead> <tbody> <tr><td>1</td><td>1%</td></tr> <tr><td>2</td><td>7%</td></tr> <tr><td>3</td><td>28%</td></tr> <tr><td>4</td><td>61%</td></tr> <tr><td>5</td><td>3%</td></tr> </tbody> </table>	Response Option	Percentage	1	1%	2	7%	3	28%	4	61%	5	3%
Response Option	Percentage														
1	1%														
2	7%														
3	28%														
4	61%														
5	3%														
Some of the workers in my section regularly behave in an unsafe manner.	2.50	0.95	<table border="1"> <caption>Response Distribution Data</caption> <thead> <tr> <th>Response Option</th> <th>Percentage</th> </tr> </thead> <tbody> <tr><td>1</td><td>9%</td></tr> <tr><td>2</td><td>58%</td></tr> <tr><td>3</td><td>18%</td></tr> <tr><td>4</td><td>13%</td></tr> <tr><td>5</td><td>2%</td></tr> </tbody> </table>	Response Option	Percentage	1	9%	2	58%	3	18%	4	13%	5	2%
Response Option	Percentage														
1	9%														
2	58%														
3	18%														
4	13%														
5	2%														
Warning signs are posted in visible and relevant locations.	3.75	0.70	<table border="1"> <caption>Response Distribution Data</caption> <thead> <tr> <th>Response Option</th> <th>Percentage</th> </tr> </thead> <tbody> <tr><td>1</td><td>1%</td></tr> <tr><td>2</td><td>8%</td></tr> <tr><td>3</td><td>18%</td></tr> <tr><td>4</td><td>68%</td></tr> <tr><td>5</td><td>7%</td></tr> </tbody> </table>	Response Option	Percentage	1	1%	2	8%	3	18%	4	68%	5	7%
Response Option	Percentage														
1	1%														
2	8%														
3	18%														
4	68%														
5	7%														
Ventilation in my section is excellent.	2.83	1.21	<table border="1"> <caption>Response Distribution Data</caption> <thead> <tr> <th>Response Option</th> <th>Percentage</th> </tr> </thead> <tbody> <tr><td>1</td><td>17%</td></tr> <tr><td>2</td><td>28%</td></tr> <tr><td>3</td><td>18%</td></tr> <tr><td>4</td><td>38%</td></tr> <tr><td>5</td><td>4%</td></tr> </tbody> </table>	Response Option	Percentage	1	17%	2	28%	3	18%	4	38%	5	4%
Response Option	Percentage														
1	17%														
2	28%														
3	18%														
4	38%														
5	4%														

⁹ Percentages may not sum to 100% due to rounding; response options are: 1 = Strongly Disagree, 2 = Disagree, 3 = Unsure, 4 = Agree, and 5 = Strongly Agree.

Safety Conditions¹⁰ (continued)

Item	Mean	StdDev	Response Distribution												
There is enough light in my section to do the job well.	3.45	1.09	<table border="1" style="display: none;"> <caption>Response Distribution Data</caption> <thead> <tr> <th>Response Option</th> <th>Percentage</th> </tr> </thead> <tbody> <tr><td>1</td><td>7%</td></tr> <tr><td>2</td><td>19%</td></tr> <tr><td>3</td><td>5%</td></tr> <tr><td>4</td><td>62%</td></tr> <tr><td>5</td><td>8%</td></tr> </tbody> </table>	Response Option	Percentage	1	7%	2	19%	3	5%	4	62%	5	8%
Response Option	Percentage														
1	7%														
2	19%														
3	5%														
4	62%														
5	8%														
Workers here are very careful to maintain safe practices.	3.57	0.82	<table border="1" style="display: none;"> <caption>Response Distribution Data</caption> <thead> <tr> <th>Response Option</th> <th>Percentage</th> </tr> </thead> <tbody> <tr><td>1</td><td>1%</td></tr> <tr><td>2</td><td>11%</td></tr> <tr><td>3</td><td>24%</td></tr> <tr><td>4</td><td>57%</td></tr> <tr><td>5</td><td>8%</td></tr> </tbody> </table>	Response Option	Percentage	1	1%	2	11%	3	24%	4	57%	5	8%
Response Option	Percentage														
1	1%														
2	11%														
3	24%														
4	57%														
5	8%														
Overall, my section is a very safe place to work.	3.75	0.80	<table border="1" style="display: none;"> <caption>Response Distribution Data</caption> <thead> <tr> <th>Response Option</th> <th>Percentage</th> </tr> </thead> <tbody> <tr><td>1</td><td>2%</td></tr> <tr><td>2</td><td>7%</td></tr> <tr><td>3</td><td>17%</td></tr> <tr><td>4</td><td>63%</td></tr> <tr><td>5</td><td>11%</td></tr> </tbody> </table>	Response Option	Percentage	1	2%	2	7%	3	17%	4	63%	5	11%
Response Option	Percentage														
1	2%														
2	7%														
3	17%														
4	63%														
5	11%														

¹⁰ Percentages may not sum to 100% due to rounding; response options are: 1 = Strongly Disagree, 2 = Disagree, 3 = Unsure, 4 = Agree, and 5 = Strongly Agree.

Confidence in Safety Knowledge¹¹

Item	Mean	StdDev	Response Distribution												
Confidence in your knowledge of the subject matter: lockout/tagout	3.31	1.47	<table border="1"> <caption>Response Distribution for Lockout/Tagout</caption> <thead> <tr> <th>Response</th> <th>Percentage</th> </tr> </thead> <tbody> <tr> <td>1</td> <td>21%</td> </tr> <tr> <td>2</td> <td>8%</td> </tr> <tr> <td>3</td> <td>21%</td> </tr> <tr> <td>4</td> <td>23%</td> </tr> <tr> <td>5</td> <td>28%</td> </tr> </tbody> </table>	Response	Percentage	1	21%	2	8%	3	21%	4	23%	5	28%
Response	Percentage														
1	21%														
2	8%														
3	21%														
4	23%														
5	28%														
Confidence in your knowledge of the subject matter: back injury avoidance	3.98	1.07	<table border="1"> <caption>Response Distribution for Back Injury Avoidance</caption> <thead> <tr> <th>Response</th> <th>Percentage</th> </tr> </thead> <tbody> <tr> <td>1</td> <td>4%</td> </tr> <tr> <td>2</td> <td>8%</td> </tr> <tr> <td>3</td> <td>20%</td> </tr> <tr> <td>4</td> <td>33%</td> </tr> <tr> <td>5</td> <td>35%</td> </tr> </tbody> </table>	Response	Percentage	1	4%	2	8%	3	20%	4	33%	5	35%
Response	Percentage														
1	4%														
2	8%														
3	20%														
4	33%														
5	35%														
Confidence in your knowledge of the subject matter: fire extinguisher training	3.28	1.37	<table border="1"> <caption>Response Distribution for Fire Extinguisher Training</caption> <thead> <tr> <th>Response</th> <th>Percentage</th> </tr> </thead> <tbody> <tr> <td>1</td> <td>15%</td> </tr> <tr> <td>2</td> <td>14%</td> </tr> <tr> <td>3</td> <td>22%</td> </tr> <tr> <td>4</td> <td>24%</td> </tr> <tr> <td>5</td> <td>19%</td> </tr> </tbody> </table>	Response	Percentage	1	15%	2	14%	3	22%	4	24%	5	19%
Response	Percentage														
1	15%														
2	14%														
3	22%														
4	24%														
5	19%														
Confidence in your knowledge of the subject matter: AIDS Awareness	4.31	0.91	<table border="1"> <caption>Response Distribution for AIDS Awareness</caption> <thead> <tr> <th>Response</th> <th>Percentage</th> </tr> </thead> <tbody> <tr> <td>1</td> <td>3%</td> </tr> <tr> <td>2</td> <td>1%</td> </tr> <tr> <td>3</td> <td>12%</td> </tr> <tr> <td>4</td> <td>32%</td> </tr> <tr> <td>5</td> <td>52%</td> </tr> </tbody> </table>	Response	Percentage	1	3%	2	1%	3	12%	4	32%	5	52%
Response	Percentage														
1	3%														
2	1%														
3	12%														
4	32%														
5	52%														

¹¹ Percentages may not sum to 100% due to rounding; response options are: 1 = Low, and 5 = Hi.

Confidence in Safety Knowledge¹² (continued)

Item	Mean	StdDev	Response Distribution												
Confidence in your knowledge of the subject matter: job hazard training	3.59	1.16	<table border="1" style="display: none;"> <caption>Response Distribution Data</caption> <thead> <tr> <th>Response Option</th> <th>Percentage</th> </tr> </thead> <tbody> <tr> <td>1</td> <td>7%</td> </tr> <tr> <td>2</td> <td>10%</td> </tr> <tr> <td>3</td> <td>28%</td> </tr> <tr> <td>4</td> <td>30%</td> </tr> <tr> <td>5</td> <td>25%</td> </tr> </tbody> </table>	Response Option	Percentage	1	7%	2	10%	3	28%	4	30%	5	25%
Response Option	Percentage														
1	7%														
2	10%														
3	28%														
4	30%														
5	25%														

Perceptions of Training Adequacy¹³

Item	Mean	StdDev	Response Distribution												
Over the past 12 months, the safety training I have received has been:	3.68	.89	<table border="1" style="display: none;"> <caption>Response Distribution Data</caption> <thead> <tr> <th>Response Option</th> <th>Percentage</th> </tr> </thead> <tbody> <tr> <td>1</td> <td>5%</td> </tr> <tr> <td>2</td> <td>8%</td> </tr> <tr> <td>3</td> <td>18%</td> </tr> <tr> <td>4</td> <td>59%</td> </tr> <tr> <td>5</td> <td>11%</td> </tr> </tbody> </table>	Response Option	Percentage	1	5%	2	8%	3	18%	4	59%	5	11%
Response Option	Percentage														
1	5%														
2	8%														
3	18%														
4	59%														
5	11%														

¹² Percentages may not sum to 100% due to rounding; response options are: 1 = Low and 5 = Hi.

¹³ Percentages may not sum to 100% due to rounding; response options are: 1 = Very inadequate, 2 = Inadequate, 3 = Unsure, 4 = Adequate, and 5 = Very adequate.