

## Corporate financial decision-makers' perceptions of workplace safety

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### Abstract

This study, through a random national survey, explored how senior financial executives or managers (those who determined high-level budget, resource allocation, and corporate priorities) of medium-to-large companies perceive important workplace safety issues. The three top-rated safety priorities in resource allocation reported by the participants (overexertion, repetitive motion, and bodily reaction) were consistent with the top three perceived causes of workers' compensation losses. The greatest single safety concerns reported were overexertion, repetitive motion, highway accidents, falling on the same level and bodily reaction. A majority of participants believed that the indirect costs associated with workplace injury were higher than the direct costs. Our participants believed that money spent improving workplace safety would have significant returns. The perceived top benefits of an effective workplace safety program were increased productivity, reduced cost, retention, and increased satisfaction among employees. The perceived most important safety modification was safety training. The top reasons senior financial executives gave for believing their safety programs were better than those at other companies were that their companies paid more attention to and emphasized safety, they had better classes and training focused on safety, and they had teams/individuals focused specifically on safety.

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### 1. Introduction

Prior research has shown that management commitment to health and safety, an important aspect of safety climate, is a key requirement for improving workplace health and safety (Barling et al., 2002; Cohen, 1977; Cooper and Phillips, 2004; Cree and Kelloway, 1997; Glendon and Litherland, 2001; Huang et al., 2006; Ilgen, 1990; Marsh et al., 1998; Siu et al., 2004; Zohar, 2002; Zohar and Luria, 2005). Many of these studies, however, have focused only on lower level management. For instance, Barling et al. (2002) and Zohar (2000) documented relationships between the characteristics of front-line supervisors, safety climate, and safety outcomes. There has been limited research focusing on the safety priorities and safety concerns of senior level executives such as the corporate financial decision-makers who determine high-level budgets, resource allocation, and corporate priorities.

The literature supports the notion that upper-level managers can impact safety outcomes (e.g., occupational injuries, safety performance). For example, Griffiths (1985) reported that top management commitment to health and safety was associated with reduced lost time injuries in the industrial gas industry. Sawacha et al. (1999) found that top management's attitudes towards safety were a significant factor in safety performance, and Simonds and Shafai-Sahrai (1977) found management involvement to be a key factor affecting injury frequencies. Rundmo and Hale (2003) applied the theory of reasoned action and planned behavior (Ajzen, 1988; Ajzen and Fishbein, 1980) to the safety attitudes and behaviors of managers. They concluded that safety attitudes can be important causal factors for managers' behavioral intention as well as their behavior. In turn it would be expected that this behavior could then affect the safety attitudes and behaviors of other employees.

According to the U.S. Census Bureau, Statistics of US Business (2003), 64% of the labor force is employed by medium-to-large companies (100 employees or more). Such organizations are more likely than small companies to have an

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individual dedicated to corporate finances who is distinct from the head of the enterprise, CEO or proprietor. The purpose of this study was to better understand how the senior financial decision-makers of medium-to-large size companies perceive important workplace safety issues.

There were three specific aims of the current study. The first aim was to explore senior financial decision-makers' perceptions of the leading safety concerns and workers' compensation losses in their companies and what their future priorities would be in terms of organizational resources and efforts for addressing different occupational injury causes. It was anticipated that senior financial decision-makers would choose to dedicate their organizational resources and efforts consistent with the safety concerns and major causes of workers' compensation losses of their companies.

The second aim was to explore senior financial decision-makers' perceptions of the direct and indirect costs of workplace injuries and return on investment of improving workplace safety. The level of financial impact they perceive may be a potential indicator of their willingness to allocate/prioritize resources to improve safety.

The third aim was to explore senior financial decision-makers' perceptions of safety programs. By understanding their perceptions of the benefits of safety programs and what they think are the best interventions, we might identify the safety interventions which the senior financial executives are more likely to support and find ways to build support for other interventions that may need greater justification. This study asked these senior financial executives to compare their companies' safety programs to those of other companies in the same industry. Those who reported their companies' safety programs were better than average were asked why they felt that way. The reasons were content-analyzed to provide additional insight.

## 2. Methodology

### 2.1. Participants and procedure

This study focused on medium-to-large size companies (100 employees or more) as such organizations were more likely than small companies to have an individual dedicated to corporate finances. Four thousand randomly selected telephone numbers from the 48 continental United States were obtained from a vendor's database commonly used by researchers to obtain representative samples of American businesses (Chen and Huang, 2005). Survey questions were developed by the project team with additional contributions from other researchers, safety and health professionals, and market research professionals. Eight core questions were formulated to assess corporate financial decision-makers' workplace safety perceptions. A pilot study was conducted with 11 participants to test the questionnaire and identify potential methods for increasing the response rate.

An established telephone interview organization with experience in data quality and confidentiality conducted the survey using their Computer Assisted Telephone Interviewing (CATI) lab. From late 2004 to early 2005, experienced interviewers contacted the most senior executives or managers responsible

for making decisions about property and casualty risk management or insurance-related services for their organizations (e.g., CFO, Director of Finance). The sampled telephone numbers were divided into a series of replicates (i.e., groups) of 200 companies per replicate. Each telephone number in the first replicate was called a minimum of seven times before the second replicate was accessed.

In order to ensure the highest possible response rate, several procedures were used which included: sending a pre-notification letter to potential respondents indicating the survey sponsor and purpose of the survey; using a team of experienced telephone interviewers; making call-backs on different days and at different times of the day; calling back "refusals" to enlist their cooperation; offering a final report to participants for completing the survey; and assuring our participants that all the individual information would be kept confidential and that only aggregate information would be reported. The project was approved by the Liberty Mutual Institutional Review Board for the Protection of Human Participants.

### 2.2. Survey topics

Demographic questions were asked regarding each participant's gender and job title, the industry type to which his/her company belongs, the number of people employed by the company, and their organization's approximate annual revenue. The specific survey topics were as follows.

#### 2.2.1. Topic 1: perceived leading safety priorities, losses and concerns

Three questions were developed to explore the leading safety priorities, losses, and concerns of corporate decision-makers. Participants were asked about the safety priorities for organizational resources and efforts for their company in the coming year (2005), as well as their perceptions of the leading causes of workers' compensation losses and the single greatest workplace safety concern for their company. Survey questions are provided in Appendix 1.

Major causes of occupational injuries were defined based on information on the most costly event types as identified annually by the Liberty Mutual Workplace Safety Index (2004). The top 12 causes (event types) were included for Question 1. Participants were asked to rate their priorities on 5-point Likert scales for addressing each cause in the next 12 months. A relative rating scale with skewed rating anchors (i.e., 1 as "Below Average" priority, 2 as "Average" priority, 3 as "Above Average" priority, 4 as "Well above Average" priority, and 5 as "One of the Highest" priorities) was used to increase variability in responses, discriminability, and quality (e.g., Bernardin and Beatty, 1984). These 12 causes appeared in the telephone script in a random order for each participant.

#### 2.2.2. Topic 2: perceived financial impact of safety

Two questions assessed participants' perceptions of the impact of safety on corporate finance. The first question included two related items: One item asked participants to estimate the ratio of direct cost to indirect cost associated with workplace

injuries and the other item asked participants what they think is the biggest cause of indirect costs. The second question focused on an estimate of the dollars returned versus dollars spent improving workplace safety.

### 2.2.3. Topic 3: issues regarding safety programs

Three core questions were developed to explore participants' perceptions on selected issues regarding safety programs. The first question asked participants what they perceived to be the top benefit of safety programs. The second question asked participants if they could make one modification to significantly improve the workplace safety of their company, what that would be. The third question asked participants to compare their companies' safety programs to those of other companies in their industry. Those who believed that their companies had better than average safety programs were asked to provide reasons why they thought they were better.

### 2.3. Data analysis

Descriptive statistics were calculated for the questions answered on the Likert scales. A Chi-square test was used to examine whether there were significant differences between the characteristics of respondents and non-respondents. Paired-sample *t*-tests were used to test the differences in mean levels of priority placed by participants on the different causes of occupational injuries. Participants' comments in reaction to the open-ended questions were content analyzed by three members of the project team. Categories were first created by a survey expert from the vendor and two other project members sorted participants' responses into each category independently. Any discrepancy was discussed among the project team, and consensus was made.

## 3. Results

Telephone surveys were conducted with 231 corporate financial decision-makers. This represents a response rate of 20%. A total of 10,819 calls (including no answer, call back, refusal, completed interview, etc.) were made in the process. The average survey length was 12 min. Table 1 shows the number and percentages of each job title, gender, industry type, number of employees and approximate annual revenue for the participants.

To assess the representativeness of our sample, industry types and company size were compared to the 2003 data from the U.S. Census Bureau. The top four industries in our database with the highest percentages of participants were also the top four largest industries in the national data for firms of employment size of 100+. Companies with 100–999 employees represented 82.6% of our participants and 91.6% of the national data. A Chi-square test was used to examine whether there were significant differences in job title ( $\chi^2 = 4.38$ ;  $p = .50$ ), company industry type using the 2-digit SIC codes ( $\chi^2 = 89.75$ ;  $p = .06$ ), and company size ( $\chi^2 = 53.92$ ;  $p = .84$ ) between respondents and non-respondents. No significant differences were observed in these factors.

Table 1  
Descriptive information of respondents and their companies

	Number	Percentage
<b>Job title</b>		
Chief Financial Officer	113	49.1
Controller	35	15.2
Vice President	22	9.5
Director of Finance	19	8.3
Chief Operating Officer	8	3.5
Risk Manager	7	3.0
Other (e.g., Treasurer, Finance Manager)	26	11.4
Total participants	230	
<b>Gender</b>		
Male	188	81.4
Female	43	18.6
Total participants	231	
<b>Industry type</b>		
Manufacturing	54	23.4
Health care and social assistance	29	12.6
Finance and insurance	22	9.5
Construction	18	7.8
Wholesale trade	18	7.8
Educational services	17	7.4
Retail trade	16	6.9
Other	57	24.6
Total participants	231	
<b>Number of employees</b>		
100–249 employees	101	43.7
250–499 employees	59	25.5
500–999 employees	31	13.4
1000–1999 employees	11	4.8
2000 or more employees	29	12.6
Total participants	231	
<b>Approximate annual revenue</b>		
Under 10 million	20	10.4
10–24.9 million	38	19.7
25–74.9 million	72	37.3
75–199.9 million	30	15.5
200–499.9 million	21	10.9
500–999.9 million	6	3.1
1 billion or more	6	3.1
Total participants	193	

### 3.1. Topic 1: perceived leading safety priorities, losses and concerns

In the first question, the corporate financial decision-makers were asked to rate their top safety priorities for resource allocation and efforts for the upcoming year from a list of the 12 major causes of occupational injuries. The results are shown in Table 2. As can be seen, the top three safety priorities reported were: (1) overexertion from lifting, pushing, pulling, holding, carrying, or throwing of an object; (2) repetitive motion such as injuries due to repeated stress or strain; (3) bodily reaction such as injuries due to bending, climbing, slipping or tripping without falling. A paired-samples *t*-test was used to examine whether there were

Table 2  
Number of respondents answering out of 231 participants (*N*), means (*M*), and standard deviation (S.D.) of 5-point Likert scale responses, paired-samples *t*-test score and the grouping results for responses to Question 1 regarding the top safety priorities for resource allocation

Causes of occupational injuries	<i>N</i>	<i>M</i> (S.D.)	Paired-samples <i>t</i> -test	Group	
Q1. Overexertion from lifting, pushing, pulling, holding, carrying, or throwing of an object	227	3.31 (1.29)		a	
Q2. Repetitive motion (such as injuries due to repeated stress or strain)	228	3.18 (1.16)	Q1 vs. Q2	1.58	a
Q3. Bodily reaction (such as injuries due to bending, climbing, slipping or tripping without falling)	229	3.16 (1.23)	Q2 vs. Q3	.05	a
Q4. Exposure to harmful substances or environment	223	2.63 (1.46)	Q3 vs. Q4	5.79**	b
Q5. Falling on the same level	228	2.62 (1.31)	Q4 vs. Q5	.38	b
Q6. Highway accidents	218	2.37 (1.44)	Q5 vs. Q6	1.92	b
Q7. Being caught in or compressed by equipment or objects	217	2.34 (1.42)	Q6 vs. Q7	.34	b
Q8. Being struck by an object (such as a tool falling on a worker from above)	224	2.27 (1.38)	Q7 vs. Q8	1.35	b
Q9. Workplace violence	227	2.26 (1.30)	Q8 vs. Q9	.37	b
Q10. Falling from heights	223	2.22 (1.26)	Q9 vs. Q10	.17	b
Q11. Striking against an object (such as an employee walking into a door frame)	229	2.20 (1.19)	Q10 vs. Q11	.76	b
Q12. Contact with high/low temperature	214	1.94 (1.17)	Q11 vs. Q12	2.88**	c

\*\*  $p < .01$ . Different letters for the paired-samples *t*-test groups indicate significant differences in means between groups.

significant differences among the means. Results showed that the mean scores of these top three safety priorities (3.31, 3.18, 3.16, respectively) were statistically tied and all were significantly higher than the rest of the categories which were equal to or less than 2.63.

When our participants were asked to name the number one cause of their company's workers' compensation losses (Question 2), as can be seen in Table 3, the most frequently reported causes were: overexertion (34.4%), followed by repetitive

motion (13.5%), and bodily reaction (11.6%). A few participants (2.3%) reported that they had not had any losses/claims for a while.

An open-ended question (Question 3) was asked regarding the single greatest workplace safety concern for our participants' companies. The results are shown in Table 4. The most

Table 3  
Frequency, percent, and valid percent for responses to Question 2 regarding number one cause of workers' compensation losses

	Frequency	Percent	Valid percent
Overexertion	74	32.0	34.4
Repetitive motion	29	12.6	13.5
Bodily reaction	25	10.8	11.6
Falling on the same level	19	8.2	8.8
Highway accidents	11	4.8	5.1
Falling from heights	6	2.6	2.8
Being struck by an object	5	2.2	2.3
Being caught in or compressed by equipment or objects	5	2.2	2.3
Carelessness, not paying attention	5	2.2	2.3
Cuts, abrasions, lacerations	5	2.2	2.3
Back injuries	4	1.7	1.9
Exposure to harmful substances or environment	2	.9	.9
Employees not adhering to safety regulations/policies	2	.9	.9
Bites, scratches	2	.9	.9
Contact with high/low temperature	1	.4	.5
We have not had any losses/claims for a while	5	2.2	2.3
Fraudulent claims	4	1.7	1.9
Other (e.g., knee injury, cumulative trauma disorder)	11	4.8	5.1
# Responses to item	215	93.1	100.0
# No response	16	6.9	
Total participants	231	100.0	

Valid percent equals response frequency divided by # of responses to item.

Table 4  
Frequency, percent, and valid percent for responses to Question 3 regarding the single greatest workplace safety concern

	Frequency	Percent	Valid Percent
Overexertion	43	18.6	20.3
Repetitive motion	31	13.4	14.6
Highway accidents	27	11.7	12.7
Falling on the same level	21	9.1	9.9
Bodily reaction	12	5.2	5.7
Being caught in or compressed by equipment or objects	11	4.8	5.2
Exposure to harmful substances or environment	9	3.9	4.2
Falling from heights	8	3.5	3.8
Employee carelessness or lack of focus	7	3.0	3.3
Flu, disease, viruses, bacteria, infection	5	2.2	2.4
Creating a safe work environment	4	1.7	1.9
Cuts, abrasions, lacerations from needles, knives, or sharp object	4	1.7	1.9
Striking against an object	3	1.3	1.4
Workplace violence	3	1.3	1.4
Safety education and training	3	1.3	1.4
Being struck by an object	2	.9	.9
Contact with high voltage/electricity	2	.9	.9
Contact with high/low temperature	1	.4	.5
All concerns are equally important	2	.9	.9
No concerns	3	1.3	1.4
Other	11	4.8	5.2
# Responses to item	212	91.8	100.0
# No response	19	8.2	
Total participants	231	100.0	

Valid percent equals response frequency divided by # of responses to item.

Table 5

Frequency, percent, valid percent and cumulative percentage for responses to Question 4a regarding the ratio of direct costs to indirect costs

Dollars of indirect cost	Frequency	Percent	Valid percent	Cumulative percentage
0–.99	32	13.9	19.9	19.9
1–1.99	44	19.0	27.3	47.2
2–2.99	34	14.7	21.1	68.3
3–3.99	25	10.8	15.5	83.8
4–4.99	8	3.5	5.0	88.8
5–5.99	13	5.6	8.1	96.9
6–6.99	0	0	0	96.9
7–7.99	1	.4	.6	97.5
8–8.99	1	.4	.6	98.1
9–9.99	0	0	0	98.1
10–10.99	2	.9	1.2	99.3
11	1	.4	.6	99.9
# Responses to item	161	69.7	100.0	
# No response	70	30.3		
Total participants	231	100.0		

Min = 0, max = 11, mean = 2.12, S.D. = 1.9, and medium = 2. Valid percent equals response frequency divided by # of responses to item. Percentage of participants reporting \$2 and above (52.8%) is equal to whole group (100%) minus the percentage of those reporting less than \$2 (47.2%).

frequently reported single greatest concerns were: (1) overexertion (20.3%); (2) repetitive motion (14.6%); (3) highway accidents (12.7%); (4) falling on the same level (9.9%); (5) bodily reaction (5.7%).

### 3.2. Topic 2: perceived financial impact of safety

The participants were asked in Question 4 to estimate the ratio of direct costs to indirect costs associated with workplace injuries and what they think is the biggest cause of indirect costs. As described in Table 5, the mean score for the ratio was \$2.12 with a standard deviation of 1.9. In other words, our participants reported that for every dollar spent on direct costs, there would be about two dollars, on average, spent on indirect costs. The median ratio was \$2:\$1: 52.8% of participants believed that at least two dollars would be spent on indirect costs, for every dollar spent on direct costs. Results from Table 6 show that the leading causes of indirect costs identified were: (1) workplace disruption, downtime, loss of productivity (41.4%); (2) worker replacement, training new employees (23.2%); (3) worker compensation, increased insurance premiums, attorney fees (16.7%).

The second question under this topic (Question 5) asked our participants to estimate how many dollars would be returned for each dollar spent improving workplace safety. Table 7 shows that 60.5% of participants believed that for every dollar spent improving workplace safety, at least two dollars would be returned. The median score was \$2. The mean score was \$4.41 with a S.D. of 12.0, showing that a few participants reported high figures which moved the average mean above the median.

### 3.3. Topic 3: issues regarding safety programs

The top benefits of an effective workplace safety program reported from Question 6, as shown in Table 8, were

Table 6

Frequency, percent, and valid percent for responses to Question 4b regarding the biggest cause of indirect costs

	Frequency	Percent	Valid percent
Workplace disruption, downtime, loss of productivity	82	35.5	41.4
Worker replacement, training for new employees	46	19.9	23.2
Worker compensation, increased insurance premiums, attorney fees	33	14.3	16.7
Unsafe acts by employees	8	3.5	4.0
Overtime/extra/high wages	7	3.0	3.5
Administrative costs	5	2.2	2.5
Poor management	3	1.3	1.5
Not an issue, not applicable, we have no costs	3	1.3	1.5
Other	11	4.8	5.6
# Responses to this item	198	85.7	100.0
# No response	33	14.3	
Total participants	231	100.0	

Valid percent equals response frequency divided by # of responses to item.

believed to be: (1) increased productivity (42.5% of respondents); (2) reduced costs (28.3%); (3) retention (7.1%); (4) employee/company morale, satisfaction among employees (5.8%).

In terms of participants' responses to Question 7, "if you could make one modification to significantly improve the workplace safety of your company, what would that be?" the intervention mentioned most frequently was to have "more/better safety-focused training and programs" (26.6%), as shown in Table 9. All other potential modifications (e.g., more safety management, better equipment and workspace, safer and cleaner environment, enforcement of policies and procedures,

Table 7

Frequency, percent, valid percent and cumulative percentage for responses to Question 5 regarding ratio of dollars spent vs. dollars returned

Dollars returned	Frequency	Percent	Valid percent	Cumulative percentage
0–.99	22	9.5	12.8	12.8
1–1.99	46	19.9	26.7	39.5
2.00	43	18.6	25.0	64.5
3.00	24	10.4	14.0	78.5
4.00	6	2.6	3.5	82.0
5.00	15	6.5	8.7	90.7
10.00	9	3.9	5.2	95.9
15.00	1	.4	.6	96.5
20.00	1	.4	.6	97.1
25.00	1	.4	.6	97.7
50.00	2	.9	1.2	98.9
100.00	2	.9	1.2	100.1
# Responses to item	172	74.5	100.0	
# No response	59	25.5		
Total participants	231	100.0		

Min = 0, max = 100, mean = 4.41, S.D. = 12, and medium = 2. Valid percent equals response frequency divided by # of responses to item. Percentage of participants reporting \$2 and above (60.5%) is equal to whole group (100%) minus the percentage of those reporting less than \$2 (39.5%).



Table 8  
Frequency, percent, and valid percent for responses to Question 6 regarding top benefit of safety program

	Frequency	Percent	Valid percent
Productivity	96	41.6	42.5
Cost	64	27.7	28.3
Retention	16	6.9	7.1
Employee/company morale, satisfaction among employees	13	5.6	5.8
Preventing injury/fewer injuries	12	5.2	5.3
Concern for employee health and well-being	10	4.3	4.4
Workplace safety	5	2.2	2.2
Reduced premiums	5	2.2	2.2
Turnover	2	.9	.9
Other	3	1.3	1.3
# Responses to item	226	97.8	100.0
# No response	5	2.2	
Total participants	231	100.0	

Valid percent equals response frequency divided by # of responses to item.

removal of hazards, and additional personnel to monitor safety) were each reported by fewer than 8% of those responding to this question.

Results from Question 8, as detailed in Table 10, showed that, among all the participants, 51.2% reported that their safety programs were better than those of other companies in their industries (44.9% reported “the same,” and 3.9% reported “not as good”). For those who thought their companies were better, the top three reasons were because they believed that: (1) their companies paid more attention to and emphasized safety (25%); (2) they had better classes and training focused on safety

Table 9  
Frequency, percent, and valid percent for responses to Question 7 regarding modification to improve safety

	Frequency	Percent	Valid percent
More/better safety-focused training	50	21.6	26.6
Safer/better/updated equipment and workspace	14	6.1	7.4
More safety management	13	5.6	6.9
More enforcement of policies and procedures	12	5.2	6.4
Improvements made to create a safer and cleaner environment	12	5.2	6.4
Remove hazards	9	3.9	4.8
Additional personnel present at all times to monitor safety	8	3.5	4.3
Screening of applicants, testing of current employees	3	1.3	1.6
More resources devoted to safety programs and prevention	2	.9	1.1
No improvements needed	44	19.0	23.4
Other	21	9.1	11.2
# Responses to item	188	81.4	100.0
# No response	43	18.6	
Total participants	231	100.0	

Valid percent equals response frequency divided by # of responses to item.

Table 10  
Frequency, percent, and valid percent for responses to Question 8 regarding why safety programs are better

	Frequency	Percent	Valid percent
We paid more attention to and emphasized safety	26	24.8	25.0
We have better classes/training focused on safety	21	20.0	20.2
We have teams/individuals focused specifically on safety	12	11.4	11.5
We have a lower accident rate	9	8.6	8.7
We have a clean/safe work environment	7	6.7	6.7
We are used as a benchmark in the industry	7	6.7	6.7
We devote a lot of resources/time to safety awareness	5	4.8	4.8
We have incentive programs geared towards improving safety	5	4.8	4.8
We have compared ourselves to others statistically	4	3.8	3.8
We have low insurance premiums	3	2.9	2.9
Other	5	4.8	4.8
# Responses to this item	104	99.0	100.0
# No response	1	1.0	

Valid percent equals response frequency divided by # of responses to item.

(20.2%); (3) they had teams/individuals focused specifically on safety (11.5%).

#### 4. Discussion

Since management commitment to health and safety is a key requirement for improving workplace health and safety, it is important to understand how managers view safety. There is limited research exploring top-level managers' views. The current study extends prior research by exploring the perceptions of a group of top-level managers who can have a significant impact on safety, the corporate financial decision-makers. Overall, the results showed that these decision-makers recognized the need for and importance of improving safety in the workplace.

As anticipated, results showed that participants' opinions of their company's safety priorities for resources for the coming year were consistent with their perceived prior workers' compensation losses across all participants. This may indicate that they tend to allocate their financial resources to areas where they perceive major losses. Interestingly, when participants were asked about their single greatest workplace safety concern, the list was somewhat different. Overexertion and repetitive motion remained first and second, but highway accidents and falls on the same level were higher on the list of concerns than bodily reaction. Without further information, we cannot draw a conclusion as to why their lists of safety priorities and concerns were not fully consistent with each other. Regarding highway accidents, participants may recognize it as a major concern but may also think that they have adequately resourced this area of loss. The greater concern could involve apprehension regarding less controllable aspects of risk in this environment (such as exposure to intoxicated or other problematic drivers) and

the exposure to liability beyond worker health and corporate property loss to injured members of the public, environmental, and emergency response impacts, etc. Many of these factors are less directly controllable; hence further allocation of resources could be felt to have diminishing returns. It is important for future studies to explore this inconsistency and further examine whether these financial executives' perceptions on losses and concerns are corroborated by data from other sources (i.e., Occupational Safety and Health Administration/OSHA recordables, Workers' Compensation data, medical records, safety records of the company).

In the present study, only half the respondents recognized that expenses associated with indirect costs of worker injuries, such as lost productivity and worker replacement, were at least double the direct costs. A prior study by the Health and Safety Executive of the United Kingdom estimated that indirect costs typically ranged between 3 and 30 times the direct costs based on the scope and severity of the event (Health and Safety Executive, 1993). In contrast, less than a third (31.7%) of the present sample believed indirect costs were three or more times higher than direct costs. Respondents also believed that the money spent improving workplace safety would have significant returns. This might suggest that corporate financial decision-makers might encourage or be receptive to safety improvement interventions. Conversely, it is possible that it could suggest that these decision-makers have an expectation of return on investment if they choose to direct resources toward a given issue. In this sense the result could be viewed as the minimum return such decision-makers will expect from a particular investment in safety. Future research could explore the basis for these estimates and whether these views actually translate to behaviors. Future studies might also explore whether there are any differences between those who give a high estimate of dollars returned and those who give a low estimate in terms of their attitudes or behavior toward safety or their company injury record. Remaining research questions may also include: What is the basis for the decision-maker's estimate? When decision-makers give an estimate for this figure, have they actually analyzed the data for their company and based their estimate on actual data?

The top benefits of an effective workplace safety program cited by participants were increased productivity, reduced costs, increased retention and better employee morale. These responses suggest that the financial decision-makers see potential benefits and the importance of improving workplace safety, and that it not only affects the bottom line but can also have positive effects on other important organizational factors (e.g., employee satisfaction and morale).

In terms of safety interventions, the modification participants mentioned most often when responding to Question 7 was to have more/better safety-focused training. Fewer participants mentioned other key elements of safety programming such as hazard assessment, correction and control. This might indicate that corporate financial decision-makers believe that the training-related changes in workers would have the greatest impact on safety or they might think that safety training is less costly than other workplace modifications and, therefore, better. Without further qualitative data, the reasons why participants

chose safety training as the number one safety intervention are unknown. Future research can explore the reasoning behind this selection.

Our findings suggest that intervention proposals related to safety training may be more readily supported by these executives. While it is good that corporate financial decision-makers recognize the importance of safety training/programs, it is also important that they understand the importance of other safety interventions. Prior research has shown the limited effectiveness of education and awareness-raising safety interventions in reducing various incidences of unsafe behavior (Connelly et al., 1998; Lobb et al., 2001, 2003). In addition, Amick et al. (2003) found that training alone did not reduce musculoskeletal symptoms for office workers but average pain levels were reduced when training was done in conjunction with supplying highly adjustable office furniture and equipment. This suggests that providing good training alone for employees is not enough if other factors are not considered. Training works better when coupled with a well-designed workplace and a high level of management commitment.

Published research indicates that, along with other factors, good housekeeping, active safety auditing, active participation of workers in safety programs and decision-making, and the application of engineering safety controls are consistently associated with lower injury rates (Shannon et al., 1996, 1997). Hunt and Habeck (1993) have also reported that safety diligence (e.g., housekeeping, active hazard and accident investigation, core value of safety throughout operations) and a pro-active return-to-work process were associated with lower workers' compensation claim rates and that participative, people-oriented workplace cultures were associated with lower overall Workers' Compensation payments—an indicator of disability severity. It is important for future studies to explore whether financial decision-makers recognize the importance of these other factors documented in the literature and identify ways to inform them about the importance of these factors.

Content analysis results of the top reasons given by senior financial executives who thought their companies' safety programs were better might suggest some possibilities for improving both occupational safety and safety professionals' ability to access resources for safety. Future studies may further explore this issue by comparing the differences in various factors (e.g., whether a company has individuals dedicated to safety, a good safety training program, or an incentive programs toward improving safety) between executives who think their companies' safety programs are better and those who do not think their safety programs are better in order to draw more specific conclusions.

It is interesting but not surprising that only a few participants (3.9%) reported that their safety programs were not as good as other companies in their industries. It is possible that executives of companies with poorer safety records tended to decline to participate in the survey. Or perhaps executives who were more pro-active about safety than those from other plants of similar type and size had more of a tendency to be willing to share their information. It is also likely that some individuals might have fallen prey to optimistic bias (Weinstein, 1987)

or in-group bias (Turner, 1978). It has been documented that individuals are often unrealistically optimistic about their own situations and the risks that they might face in the future, commonly referred to as the optimist bias. There is a similar concept in social psychology, in-group bias, that suggests that when a person groups himself/herself with others, s/he is more likely to favor those of his/her own group as compared to another group. Since no company safety records were collected in this study, we do not know whether these senior financial executives' perceptions accurately reflect objective data. However, this study gives insight into the beliefs upon which they may be determining high-level budgets, resource allocation, and corporate priorities.

The current study has several limitations. First, due to practical constraints, we were able to explore only the perceptions of senior financial executives about safety issues. The type, frequency, and severity of the injuries of their companies cannot be identified and there could be problems with the self-reported data (e.g., social desirability effects). Future research should collect data from multiple sources and try to include objective injury rate records or workers' compensation claim records to examine whether there is consistency between perception and reality, and further identify potential interventions if there is a gap between the two. Second, the study did not explore in depth information on all the reasons behind the executives' choices; for example, no questions examined what types of safety programs their companies had or how these safety programs were perceived by these executives to work (e.g., employee learns safer technique for doing a given task). Future research might further investigate these issues. Furthermore, although this study focused solely on financial representatives who are not often used in occupational safety research, this targeting of high level management and the stringent sampling procedure resulted in a somewhat low response rate. Although there was no significant respondent/non-respondent bias occurring in the demographic variables, caution should be used when generalizing the results to the whole population. Finally, in terms of the procedure for content analysis, because we focused on reaching consensus about our judgment in an iteration process, we did not use any ratings to assess inter-rater agreement or inter-rater reliability. Although this approach has been used in various qualitative research and is seen in prior studies (e.g., Huang et al., 2004), future studies may consider providing inter-rater reliability or agreement to strengthen the analysis procedure.

## 5. Conclusion

In conclusion, the top three safety priorities reported by the participants (i.e., overexertion, repetitive motion, and bodily reaction) were consistent with the top three causes of workers' compensation losses across all participants. Our participants believed there were both direct and indirect costs associated with workplace injury and that money spent improving workplace safety would have significant returns. The most important safety modification perceived by senior financial executives was safety training. Consideration should be given in future studies to raising awareness that training needs to be combined with workplace modifications to be successful. The top reasons senior

financial executives believed their safety programs were better than those at other companies were because their companies paid more attention to and emphasized safety, they had better classes and training focused on safety, and they had teams/individuals focused specifically on safety. These study results may better inform the literature on the perceptions of senior financial executives and managers of medium-to-large companies concerning important workplace safety issues and serve as a basis for further investigations.

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## Appendix A

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- Question 1 The following series of questions deal with causes of occupational injuries, and your priority of addressing them in the next 12 months. Now I'd like to ask you to use your professional judgment to rate and differentiate those work hazards on a 5-point scale, with 1 as "Below Average" priority, 2 as "Average" priority, 3 as "Above Average" priority, 4 as "Well above Average" priority, and 5 as "One of the Highest" priorities. In the next 12 months, what priority for organizational resources and efforts will you and/or your company give to the occupational injuries caused by (12 injury causes—see Table 2 for list)
- Question 2 What is the number one cause of workers' compensation losses in your company?
- Question 3 What is the single greatest workplace safety concern for your company in the coming 12 months?
- Question 4 a. There are direct costs (such as payments to medical providers and the injured employee) and indirect costs (such as lost productivity and worker replacement costs) associated with the workplace injuries. Based on your professional experience with both types of costs, for each dollar of direct cost, how many dollars are spent on indirect costs?  
b. What do you think is the biggest cause of indirect costs?
- Question 5 In your professional opinion, for each dollar spent improving workplace safety, how many dollars are returned? We are asking for the ratio of dollars spent vs. dollars returned
- Question 6 What is the top benefit of an effective workplace safety program?
- Question 7 If you could make one modification to significantly improve the workplace safety of your company, what would that be?
- Question 8 a. How do your company's workplace Safety Programs compare to other companies in your industry? (1) not as good, (2) the same, (3) better  
b. (for those who answer "better" on Q8a.) Why do you think your company's Safety Programs are better compared to other companies in your industry?
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