

Accident Frequency and Supportive Perceptions: A Study in Ghana's Work Environment

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Abstract: Relevant research in the accident and safety literature has demonstrated the impact of organizational climate on industrial accidents and safety related behaviours. There is paucity regarding the examination of the relationship between accident frequency and supportive perceptions (POS). The current study thus empirically investigated this relationship. Additionally, it examined the relationship with job satisfaction and compliance with safe work practices. To arrive at the intended examination, participants were divided into two categories: low and high accident frequency groups. Differences of statistical significance regarding their assessments on POS, job satisfaction and safe work practices were identified by a one-tailed t-test analysis. Workers in the low accident category indicated higher supportive perceptions than their counterparts in the high accident category. Correspondingly, they expressed more job satisfaction and were more committed to safe work practices. The findings thus have implications for safety management policies and are discussed.

Key words: Safety management, industrial accidents, perceived organizational support, organizational safety climate, accident frequency

INTRODUCTION

Industrial accidents and injuries are a source of substantial human and economic cost. Available data reveals the alarming and extremely high rate of work-related deaths and injuries in both the developed and developing nations (National Safety Council, 2004; Institute of Medicine, 2000). According to the latest data from the NSC (2004), industrial accidents cost the United States' economy a staggering sum of \$156.2 billion and an estimated number of 3,400,000 disabling injuries. Each week work day a fatal injury occurs every 2 h and a disabling injury, every 8 h. However, the period between 1912 and 2003 has seen a substantial reduction in accidental deaths and workplace injuries. This in turn has reduced the high rate of human and economic cost per 100,000 population. With a workforce nearly quadrupled in size, estimated deaths have fallen from 21,000 to 4,500. This great stride has been achieved by the application of ergonomic methodology, the implementation of risk assessment programs and effective safety management policies.

Unfortunately, in Africa and other developing nations, industrial and occupational injury-related deaths and disabilities are among the leading causes of death mortality (Murry and Lopez, 1997). It has been estimated that over 120 million industrial accidents with over 200,000 fatalities occur each year in these nations. Inappropriately, this is the area which has 80% of the

world's labour force, but with only 5-10% of them having access to professional ergonomics and effective safety management programmes (ILO, 2002; WHO, 1995). This report seems to be the small tip of a much larger iceberg, considering the high rate of under-reporting that goes on in these workplaces (Takala, 1999).

Despite this burgeoning problem, little attention has been paid to industrial and occupational accidents and injuries in terms of research efforts and or organized preventive intervention programs. Efforts to combat this problem of industrial and occupational accidents in Ghana, Africa and the developing world as a whole have been hampered by limited financial resources and lack of adequate data. In light of such limitations, prevention emerges as the most cost effective strategy to decrease disability and the high death toll in the workplace. It is therefore critical that the conventional antecedents of industrial mishaps, as well as the organizational factors that may affect worker safety at the workplace are carefully examined. One such organizational factor is referred to as perceived organizational support.

Perceived organizational support, organizational safety climate and accident frequency: According to the literature on organizational behaviour, Perceived Organizational Support (POS) refers to workers general perception regarding their managements'/organizations contributions and concern for their well-being (Aselage and Eisenberger, 2003; Eisenberge *et al.*, 2001).

Organizational support theory thus supposes that workers infer the extent to which organizations care about their well-being from meaningful organizational and social organizational values, norms, beliefs, practices and structures operational at the workplace. The notion of organizational support has attracted a growing body of research interest. Among these are research reports that have indicated a positive association between POS and workers level of job satisfaction (Gyekye, 2006; Michael *et al.*, 2005) organizational involvement, affective commitment (Michael *et al.*, 2005), performance expectations and innovative behaviours (Aselage and Eisenberger, 2003; Eisenberger *et al.*, 1990) compliance with organizational safety management policies (Gyekye, 2006) and involvement in extra-role and pro-social organizational behaviours (Aselage and Eisenberger, 2003; Eisenberger *et al.*, 2001). It has also been negatively associated with turnover, absenteeism (Shore and Wayne, 1993) and withdrawals (Michael *et al.*, 2005). A recent meta-analysis of the literature on POS by Rhoades and Eisenberger (2002) found strong support for all these findings.

Despite the substantial and growing interest in the organizational literature on POS, an examination of POS in the context of safety-related behaviours is still in the embryonic stages. No attempts have been made to examine the relationship between supportive perceptions and accident frequency. A notable exception is that of Hofmann and Morgesons (1999) investigation on POS as it relates to safety communication, safety commitment and accidents. Accordingly, the main purpose of this study was to empirically examine supportive perceptions in the context of safety-related behaviours, as they have critical implications for safety management policies. Special attention was thus paid to investigating the relationship between POS and workers accident involvement rate. Supplementary analyses involved examining the relationship between accident frequency and job satisfaction and workers compliance with safety management polices. The paucity of research on industrial accidents and safety interventions in developing nations, particularly Africa, constitutes another reason for these analyses.

Existing theory and research suggest POS to be context-related phenomenon that is influenced by the organizational climate: the shared perceptions about organizational values, norms, beliefs, practices and procedures (Cooper and Phillips, 2003; Eisenberger *et al.*, 2001; Silva *et al.*, 2004). Workers supportive perceptions therefore do not happen in a vacuum, but are drawn from the social and organizational circumstances in which they perform their assignments. In effect, it is their appraisals, assessments and evaluations of workplace conditions

that promote, advance or discourage supportive perceptions. An important subset of organizational climate has been recognised to be safety climate, which is the coherent set of perceptions and expectations that workers have regarding safety in their organizations (Cooper and Phillips, 2003; Silva *et al.*, 2004). As documented by these researchers, the organizational climate in a work environment imparts significant influence on safety climate, which in turn impacts on workers' safety behaviour and subsequently on their accident involvement rate.

This link between safety climate and accident frequency is well documented. For example, research reports along this line have indicated that workers with negative perceptions on safety climate (high workload, work pressure) tend to engage in unsafe acts, thereby increasing their susceptibility to accidents (Hofmann *et al.*, 2003; Salminen, 1995). Similarly, workers who perceive job insecurity, anxiety and stress, have exhibited a drop in safety motivation (Probst, 2002; Probst and Brubaker, 2001) and recorded a relatively higher accident rate (Siu *et al.*, 2004). On the contrary, workers with positive perceptions regarding safety climate have expressed greater job satisfaction (Gyekye, 2005, 2006; Williams and Anderson, 1991) registered fewer accidents (Gyekye, 2006; Harrell, 1990).

Additionally, when workers have perceived that their organizations management are supportive and concerned about their general well-being, they have displayed greater emotional attachment, involvement and have internalised their organizational values and norms with stronger feelings of allegiance and faithfulness (Aselage and Eisenberger, 2003; Eisenberger *et al.*, 2001) greater motivation to engage in extra-role commitments (Gyekye and Salminen, 2005b; Eisenberger *et al.*, 2001; Simons and Robertson, 2003) displayed loyalty (Aselage and Eisenberger, 2003) and abided by safety regulations (Gyekye and Salminen, 2005b; Gyekye, 2006; Hofmann and Morgeson, 1999). Based on the above discussion, it sounds logical to expect that differences in workers accident involvement rates will be influenced by the extent of job satisfaction, motivation to comply with safe work practices and perception in regards to their organizations as being supportive or apathetic to their concerns and well-being.

Hypotheses: Consistent with the literature review and argumentations, the following hypotheses were proposed:

H1: Accident frequency and POS: A negative relationship is anticipated; workers with supportive perceptions will register fewer accident involvement rates and vice versa.

H2: Accident frequency and job satisfaction: A positive relationship is anticipated; workers who express more job satisfaction will register lower accident rate and vice versa.

H3: Accident frequency and commitment to safe work behaviours: It is anticipated that workers in the low accident category will be more committed to safety management policies and vice versa.

MATERIALS AND METHODS

Participants: The participants were 320 Ghanaian industrial workers with 75% as subordinate workers and 25% as supervisors. Due to the interest on accident frequency, the participants were divided into two categories (low and high) based on their accident frequencies. The low accident group consisted of: n = 173; age (18-29 years = 11%, 30-39 years = 41%, 40-49 years = 83%, 50+ years = 85%); sex (male = 49%, female = 71%); work experience (1-12 months = 8%, 1-4 years = 14%, 5-10 years = 66%, 11-14 years = 86%, 15 years = 91%). The high accident category was made up of: n = 129; age (18-29 years = 86%, 30-39 years = 59%, 40-49 years = 17%, 50+ years = 15%); sex (male = 51%, female = 29%), work experience (1-12 mths = 92%, 1-4 years = 86%, 5-10 years = 34%, 11-14 years = 34%, 15 years = 9%).

The presentation of the interview was done during the lunch breaks. The duration varied from 15-20 min, depending on the context in which they were conducted and on respondents level of education. The questionnaire interview was presented in English language. Where respondents were illiterates or semi-illiterates and had problems understanding English language, the services of an interpreter was sought and the local dialect was used. The supervisors were educationally sound and filled in the questionnaire on their own. To ensure accuracy of responses, particular on issues that related to noncompliant job behaviours and worker counterproductive behaviours, it was emphasized that the study was part of an academic work and that no person affiliated with their organization was involved in any way. Participants were thus assured of complete confidentiality.

Measures, questionnaire scoring and reliability:

Perceived organizational Support was measured with the short version of Eisenberger *et al.* (1990) survey of perceived organizational support. The scale consisted of eight items and assesses workers evaluations of organizational issues that affect their well-being. Sample items were The organization values my contribution to its well-being The organization takes pride in my accomplishments and Help is available from the

organization when I have a problem. Responses to this scale in the current study produced satisfactory reliability of .97. Participants responded on a five-point scale ranging from 1 (not at all) to 5 (very much).

Job satisfaction was measured with Porter and Lawler's (1968) one-item global measure of job satisfaction. This was chosen because single-item measures of overall job satisfaction have been considered to be more robust than scale measures (Wanous *et al.*, 1997). Besides, it has been used extensively in the organizational behaviour literature (Gyekye, 2005, 2006; Harter *et al.*, 2002). The measure has five response categories ranging from extremely dissatisfied to extremely satisfied corresponding to the five-point response format 1 = (not at all) to 5 = (very much).

Items for compliance with safety behaviour were pooled from the extant literature. They comprised of 4 questions that assessed workers compliance to safety behaviour. Sample items were Keep my workplace clean Follow safety procedures regardless of the situation. Participants responded on a five-point scale ranging from 1 (not at all) to 5 (very much).

Accident involvement was measured by participants responses to the question that asked them to indicate the number of times they have been involved in accidents in the past 12 months. All cases studied were accidents classified as serious by the safety inspection authorities.

Data analysis: Statistical analysis of the data was done with SASv8-2001. Participants responses to accident involvement rate were split into two to reflect workers with high (2+accidents per year) and low (0-1 accident per year) accident frequencies. Using accident frequency as an independent variable, differences with workers supportive perceptions were identified by a one-tailed t-test analysis. This provided an item-by-item score for the 8 items on the POS scale. Participants responses to job satisfaction and safe work practices were subjected to a similar procedure. Items that were not completed by the respondents were coded as missing values and excluded from the analyses.

RESULTS

As noted earlier, it was hypothesized accident frequency would relate positively with POS, job satisfaction and with compliance with safe work behaviours. The findings supported the hypotheses. With regard to

H1: As indicated by the t-tests, the difference regarding perceptions of organizational support between the two categories of workers was of highly statistical

Table 1: Workers ratings on job satisfaction, safe work behaviour, POS and POS items

| Variables | Low Accd. group | | | High Accd. group | | | T-test |
|--|-----------------|-------|------|------------------|-------|------|---------|
| | N | M | Std | N | M | Std | |
| Job satisfaction | 171 | 4.11 | 0.92 | 125 | 2.23 | 1.23 | p<0.05 |
| Safe work behaviour | 166 | 20.23 | 3.15 | 122 | 12.11 | 4.41 | p<0.001 |
| Perceived Organizational Support (POS) | 169 | 33.15 | 4.38 | 128 | 15.53 | 5.32 | p<0.001 |
| Organization values my contribution | 169 | 4.12 | 0.77 | 128 | 2.19 | 0.84 | p<0.001 |
| Organization considers my goals | 172 | 4.13 | 0.84 | 129 | 2.13 | 0.84 | p<0.001 |
| Organization will understand a long absence | 173 | 4.05 | 0.52 | 129 | 1.86 | 0.83 | p<0.001 |
| Help is available from organization | 173 | 4.06 | 0.78 | 129 | 2.89 | 0.96 | p<0.05 |
| Organization cares about my well-being | 173 | 4.24 | 0.82 | 129 | 1.81 | 0.93 | p<0.001 |
| Organization will forgive an honest mistake | 173 | 2.14 | 0.82 | 129 | 2.92 | 0.86 | ns |
| Organization tries to make my job interesting | 173 | 4.18 | 0.79 | 129 | 1.59 | 0.94 | p<0.001 |
| Organization takes pride in my accomplishments | 173 | 4.14 | 0.82 | 129 | 1.63 | 0.89 | p<0.001 |

ns = Not of statistical significance

significance ($t = 3.43$, $df = 169$, $p < 0.001$). As reflected on Table 1 workers in the low accident category expressed better perception of organizational support than their counterparts in the high accident category. An item-by-item analysis reveal that, in contrast to their work colleagues in the high accident category, the workers in the low accident category registered how their organizations appreciate and value their contributions ($t = 2.58$, $df = 169$, $p < 0.001$), provide help in time of need: Help is available from the organization ($t = 2.67$, $df = 169$, $p < 0.001$). Additionally, they noted that their organizations care about their well-being ($t = 2.14$, $df = 172$, $p < 0.001$), make their jobs interesting ($t = 2.56$, $df = 169$, $p < 0.001$), consider their goals ($t = 1.88$, $df = 168$, $p < 0.001$) will understand a long absence ($t = 1.63$, $df = 165$, $p < 0.05$) and takes pride in their accomplishments ($t = 3.43$, $df = 169$, $p < 0.001$). A non statistically-significant result was obtained on organization will forgive an honest mistake.

H2: A positive relationship was recorded between accident frequency and job satisfaction. Workers in the low accident category expressed more job satisfaction than their counterparts in the higher accident category ($t = 1.34$, $df = 170$, $p < 0.05$).

H3: A positive association was recorded between accident frequency and commitment to safe work behaviours. Workers in the low accident category were more committed to safe work practices than their counterparts in the high accident category ($t = 2.56$, $df = 168$, $p < 0.001$).

DISCUSSION

The major focus of the study was to examine the relationship between accident frequency and perception of organizational support. Supplementary analyses were done on the relations between accident frequency and safe work behaviours and job satisfaction. The major finding was an association between POS and accident

frequency. Workers in the lower accident category reported positive and beneficial perceptions regarding organizational support than their colleagues in the high accident category. This finding apparently reemphasises the role of social support in the accident process (Sherry, 1991). Where supervisors and co-workers have been important sources of task and informational support, the rate of accidents and injuries have been reduced (Sherry, 1991; Iverson and Erwin, 1997). Plausibly, the workers perceptions regarding organizational support impacted on their perceptions on organizational safety climate, with subsequent implications for their job satisfaction, work behaviours and accident involvement. As recorded in the results, workers in the lower accident category reported more job satisfaction and were more committed to safe work practices than their counterparts in the high accident category. Ostensibly, these workers had perceived that their organizations are supportive, concerned and interested in their general well-being and hence value their safety as well. This perception of management's sensitivity to their safety and concerns was the main catalyst that incited job satisfaction and motivation for compliance with the organization's safety management policies with the subsequent decrease in their susceptibility to accidents.

The central theories used in explaining the motivational basis behind these positive organizational behaviours in the organizational literature have been the Social Exchange Theory (Blau, 1964) and Reciprocity Theory (Gouldner, 1960). Basically, what these theories espouse is that the expression of positive affect and concern to others create a feeling of indebtedness and a corresponding sense of obligation to respond positively in return. When workers perceive a high level of organizational concern and support, they feel obligated to reciprocate in terms that benefit their organizations/management. Such reciprocals include personal sacrifices which usually have translated into active engagement in pro-social organizational behaviours, such as compliance

with safety management policies, which in turn reduces their accident involvement rate. Apparently, workers in the lower accident category were committed to the organizations safety management policies as an avenue to reciprocate the implied obligation resulting from their supportive perceptions concerning management's concern and support. The current finding thus corroborates suggestions regarding the social exchange theory and the norms of reciprocity as basis for workers safety-related behaviours (Hofmann and Morgeson, 1999; Hofmann *et al.*, 2003). This argument plausibly underlies why researchers have always found a strong and positive relationship between POS and job satisfaction (Williams and Anderson, 1991) active engagement in pro-social organizational behaviours (Aryee *et al.*, 2002) and extra-role commitments.

As reflected from the results data, it is plausible that increase in accident frequency results from worker sensitivity to a variety of workplace conditions that are perceived to reflect management's concern or apathy towards workers safety and well-being. This observation thus reinforces previous findings on industrial accidents and safety-related behaviours as context-related phenomenon influenced by a variety of contextual factors (DeJoy *et al.*, 2004), such as the prevailing organizational safety climate (Probst 2002; Probst and Brubaker, 2001). Additionally, it replicated most of the findings in Western studies: Examples of these are, the positive association between organizational safety climate and job satisfaction (Williams and Anderson, 1991), with a decrease in accident involvement rate (Harrell, 1990; Frone, 1998); the inverse relationship between safety perception and compliance with safe work practices (Probst, 2002; Probst and Brubaker, 2001) and subsequent susceptibility to accidents (Salminen, 1995; Siu *et al.*, 2004). This observation thus points to the generalizability about the impact of organizational climate on organizational behaviours, specifically, in safety-related behaviours. In summary, the findings in the current study indicate that a strong commitment to improving work place conditions and concrete display by management of their concern and commitment to workers well-being would likely produce an increase in worker job satisfaction, motivation to comply with safety management policies and consequently, a reduction in workers accident involvement rate.

Implications: A significant practical implication of the current findings in the work environment would be that interventions aimed at increasing organizational support and concern for workers' well-being should be intensified in work environments. Management's commitment has

been known to predict safety culture in numerous studies (Hayes *et al.*, 1998; Michael, 2005). Accordingly, workers perceptions regarding management's commitment and attitude to safety are therefore regarded as the cornerstone of safety programmes. Unfortunately, perceptions regarding management's commitment and attitude in Ghana's work environment have been documented as unconstructive and disapproving. In a recent safety perception survey (Gyekye, 2006) and a study that examined causality and responsibility attributions for industrial accidents (Gyekye, 2001; Gyekye and Salminen, 2004) management was perceived as being nonchalant to workers' concern and well-being. Factors cited by the accident victims and subordinate workers for the accident causality were: poor housekeeping, unsafe and defective equipments, non-existence of recreational and dining facilities, lack of basic essentials such as protective gear and the low wages, all of which reflected supervisors ineptitude and management's apathy towards the workers. Not surprisingly, management was held responsible and accountable for the high rate of industrial accidents in Ghana's workplaces (Gyekye and Salminen, 2004).

Appropriately, industrial accidents could be reduced when management openly, convincingly and proactively demonstrates its commitment and concern for workers well-being and safety. The literature on POS is satiated with such organizational structures: increasing worker's level of job satisfaction (Williams and Anderson, 1991; Yoon and Suh, 2003) implementing fairness perception measures (Simons and Robertson, 2003) and providing support and showing commitment to workers beyond what is formally stated in the contractual agreement (Aryee *et al.*, 2002). Additionally, they could provide the right job equipment, job enrichment programmes, skill-training opportunities, visiting workplaces to alert workers of dangerous work practices and explicitly expressing concern for their safety. Bonus and incentive schemes could be instituted as interventions to motivate work safety.

Another observation was the low mean scores recorded on organizations will to forgive an honest mistake. This depicts a poor safety climate in which management is committed to punitive sanctions for breaches of safety policies. The fear of being at the receiving end of punitive sanctions only breeds misattribution and distortion of accident causality and subsequently, the implementation of ineffective and inappropriate safety management policies (DeJoy, 1994; Gyekye and Salminen, 2004). To ensure sound and accurate accident analyses, it will be crucial that workers are not routinely subjected to culpability and punishment.

A safety climate in which management and supervisors adopt a committed and non-punitive approach to safety, would result in norms of behaviour that will encourage workers to be more open about their job-skill deficiencies and to accept responsibility rather than resort to defensiveness. It is worthwhile to note from this study and others that efforts to reduce industrial accidents, influence organizational behaviour and motivate workers to engage in safer work practices would fail if the environment is not supportive (DeJoy *et al.*, 2004; Michael, 2005). It might interest organizational management to note that tangible investment to create supportive environment in workplaces will not only reduce the substantial human and economic cost inflicted by accidents, but reaps in corporate dividends in terms of worker efficiency and productivity.

Limitations: The major limitation of this research was the use of self-reported measures. The possibility thus exist for the findings to be distorted by participants' desire to respond in a consistent manner. However, recent meta-analytic research by Crampton and Wagner (1994) indicates that while this problem continues to be cited regularly, the magnitude of distortions may be overestimated. Self-reported measures have been effectively used in accident and safety analyses (Gyekye, 2005, 2006; Siu *et al.*, 2003). Besides, while epidemiologic reports have been found to be faulty, biased and deficient because of poor documentation (Parker *et al.*, 1994; Veazie *et al.*, 1994) research reports have found self-reported accident rates to be closely related to documented accident rates (Smith *et al.*, 2001). Notwithstanding, the current study reveals the influential bearing that organizational support has on job satisfaction, determinants of safety performance in work environments and workers accident involvement rate. It thus adds to our understanding of the influence of perceived organizational support and safe work behaviours. Although the study drew on responses from Ghanaian participants, a large number of other African and developing nations have workplace characteristics similar to those of Ghana. Consequently, the current findings and recommendations may apply to substantial numbers of African, Latin American and South East Asian countries with work environmental characteristics similar to that of Ghana.

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