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Safety Attitudes in the Aviation System: Influences of a Highly Regulated Environment

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SAFETY ATTITUDES IN THE AVIATION SYSTEM: INFLUENCES OF A HIGHLY REGULATED ENVIRONMENT

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Although safety is considered paramount in the aviation industry, very few studies have explored the influence that such a highly regulated environment may have on safety attitudes. This paper explores how perceptions and attitudes may be influenced by context characteristics and analyses how a highly regulated context, such as the aviation industry, compares with other industries. Results suggest that the aviation industry seems to be centered on individual behaviors and attitudes towards safety; in contrast other industries highlight safety at the organizational level. Implications of these results and repercussions of national safety campaigns to promote safety at the workplace are considered.

Introduction

Workplace safety and, in particular, the analysis of occupational accidents have emphasized the importance and interrelationship of two main contributors: The technical component which involves physical working conditions, machinery, equipment and work instruments and the Human component comprising job incumbents, teams, supervisors and top managers (e.g., Oliver, Cheyne, Tomás & Cox, 2002; Sarkus, 2001). The development of a positive safety culture and constructive attitudes towards safety are considered as an important and effective strategy to promote and maintain a safe workplace. In many instances, attitude surveying is recommended as a quick and helpful way of conducting a safety diagnostic.

The literature on safety attitudes presents a variety of dimensions and a plethora of instruments (e.g., Cox and Cox, 1991; Díaz & Cabrera, 1997; Glendon, Staton & Harrison, 1994; Zohar, 1980). A renaming and grouping exercise on the existent measures is considered necessary (Guldenmund, 2000; Sorensen, 2002) with possible identification of core dimensions and clear explanations on the issue of dimensionality. These efforts led to the development of a measure to evaluate attitudes towards safety that can be used in various contexts (D'Oliveira, 2004). A methodology similar to the one adopted by Williamson, Feyer, Cairns and Biancotti (1997) was used and a measure considering eight scales was put together. Safety areas considered were: Organizational objectives, organizational practices and safety, information on safety issues, management and supervisors' attitudes, personal attitudes to safety, risk perceptions and relationships with co-workers.

Safety is paramount in the aviation system and efforts have considered both the technical component (e.g., by fostering safer machinery) and human interventions (e.g., through improved training like CRM). The industry investments in standards and practices led to an outstanding safety record (ICAO, 2004).

Context characteristics such as the activities performed, the hazards involved and the degree of regulation imposed by the industry may play an important role when discussing safety attitudes and safety culture. These characteristics have yet to be considered in the literature on safety culture/climate. Very few studies have considered safety attitudes in different industries (e.g., Diaz & Cabrera, 1997). This paper addresses these issues and explores how perceptions and attitudes may be influenced by context characteristics and analyses how a highly regulated context, such as the aviation industry, compares with other industries.

Method

Participants

A total of 346 participants, 60.4% men and 396 females, from various industries (aviation, health, car industry, metal industry, etc.) were invited to participate in this study. Table 1 presents sample's main characteristics.

Table 1. *Participants' main characteristics*

Age	$\underline{M}$ = 36.71, $\underline{SD}$=10.09
Qualifications	$\underline{M}$ = 9.9 years
Contract	Full time permanent = 84.3 %
Position	Supervisor = 19.1%
Industry	Aviation = 25.4%; Non Aviation = 74.6% Pilots, Cabin crew, Maintenance

Instrument

A measure was developed using a methodology similar to the one adopted by Williamson, Feyer, Cairns and Biancotti (1997) was used in this study. Specifically, a review of the literature was conducted in order to identify potential measures of attitudes towards workplace safety. All potential measures were then considered as a full set and items were assembled according to their content. This procedure led to the identification of seven dimensions: organizational objectives, organizational practices and safety, information on safety issues, management and supervisors' attitudes, you and safety issues, personal appreciation of risk and relationships with coworkers. A detailed definition of each dimension (Table 2) was then produced and eight items were selected to represent each safety attitude dimension. The final measure was composed of 56 items, each item being responded in a 5 point rating scale.

Table 2. *Safety attitude dimensions (Cronbach's values for each dimension).*

Sub-Scale Definition
A – Organizational Objectives This dimension considers how the Organization values safety issues. The potential conflict between safety and productivity, the Organization openness to discuss issues related to safety and proposals by the employees are some of the issues considered in the literature (α = .725).
B- Organizational Practices & Safety This dimension addresses how organizational practices such as training, performance evaluation, promotion, accident/incident investigation may be related with safety (α = .850).
C - Information on Safety Issues This dimension tries to evaluate how the Organization stimulates the diffusion of information related with safety by creating safety awards, safety bonus, how workers might present suggestions or report their safety concerns, etc (α = .720).
D- Management & Supervisors Attitudes In this dimension, supervisors and top managers' behavior is considered by assessing workers perceptions of their technical knowledge on safety issues, proactive or reactive safety attitude and their support to workers safety concerns (α = .806).
E – Yourself & Safety This dimension considers the knowledge and satisfaction of workers in relation to safety and their awareness of the consequences of their behavior to safety in general (α = .776).
F – Risk Perceptions In this dimension workers' perceptions of the risks involved in their activities are considered along with their estimative of how probable it is to be involved in an accident (α = .717).
G – Relationships with coworkers This dimension considers workers perceptions of their colleagues' knowledge and behaviors related to safety. It also includes the perception of being part of a group and how this characteristic influences personal behavior (α = .808).

Procedure

A general instruction was given to every participant as to how they should fill in the questionnaire: volunteers should give a description of their own company regarding safety issues. The objective of the study was to gather information that could help companies to improve their safety policies and results.

Results

A total of seven MANOVAS were conduct in order to explore potential differences between aviation and non aviation participants. Table 3 summarizes main results obtained in these analyses.

Table 3. *Differences between aviation and non-aviation participants in each subscale*

Sub-Scale	Results
Organizational Objectives	Pillai's Trace= .163, F= 7,990; p<.000 Non aviation has higher means
Organizational Practices & Safety	Pillai's Trace= .108, F= 4,958; p<.000
Information on Safety Issues	Pillai's Trace= .135, F= 6,374; p<.000 Non aviation has higher means (ns differences)
Management & Supervisors Attitudes	Pillai's Trace= .141, F= 6,859; p<.000
Yourself & Safety	Pillai's Trace= .266, F= 15,149; p<.000 Aviation has higher means
Risk Perceptions	Pillai's Trace= .105, F= 4,751; p<.000 Non aviation has higher means
Relationships with coworkers	Pillai's Trace= .189, F=9,675; p<.000

Discussion

Results obtained suggest differences between aviation and non-aviation participants in every dimension. In what concerns organizational objectives, information on safety issues and risk perceptions, non-aviation systematically has higher means.

Non-aviation participants compose a positive depiction of their companies: safety goals are clearly stated, safety procedures work well and are followed, there seems to be more information available on safety issues but it is recognized that sometimes there is a conflict between productivity and safety, something mentioned in the literature.

In what concerns aviation participants, they seem to have a personal relation with safety issues that appears to be more positive (receive safety information, understand safety rules, know training needed) and there is a proactive attitude towards safety (recognize that their personal intervention may avoid potential hazards), and attitudes and behaviors associated with an appreciation of risks involved in their jobs.

Organizational practices and procedures towards safety, management and supervisor's behaviors and attitudes and relationship with colleagues although presenting mixed results provide support to the differences previously identified. In the aviation context, safety is part of performance appraisal, supervisors are aware of what safety training each worker has, and participants report reliable safety behaviors in their colleagues. Non-aviation participants report that their work procedures are accurate and a reflection of what they actually do in their jobs, characteristics probably associated with a lesser degree of complexity in their jobs.

All in all, results suggest the presence of two different safety systems. Aviation safety systems seem to have at their centre individual safety qualifications: a greater risk in the activities performed is associated with the requirements for specific and formal safety training. Such qualifications are quite relevant in this context; not only are they included in the performance appraisal but also management and supervisors are aware of each worker qualifications. In the aviation context, if you do not have the necessary safety training, you will not be able to work.

In contrast, non-aviation industries seem to centre on the company safety records as a whole: company goals are emphasized, general information on safety is available, supervisors encourage involvement in safety issues and are perceived to know safety inspections' results. This analysis is further supported by non-aviation better results in "we are recognized and rewarded for working together".

In this sense it would be appropriate to say that aviation safety systems are individualistic by nature and non-aviation safety systems are much more collectivistic. Such perspectives can also be associated with an "organizational locus of control or accountability".

Results from non-aviation organizations may be related with recent government investments in workplace safety. Portugal has one of the worst work accident rates in the European Community. Support for safety training, safety programs, safety prizes, safety inspections and media campaigns have been created to address this problem. The problem is depicted as a national problem (national statistics may involve anyone) or an organizational problem (fines for companies that do not follow safety recommendations) and an issue that needs every person's contribution. Such perspective helps to depart from an individualistic approach of work accidents or the bad apple theory (Dekker, 2002) that hinders organizational safety learning. Advantages of this viewpoint should be considered by aviation safety systems as it may complement the existing perspective.

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