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CHANGES IN SAFETY ATTITUDES IN A CANADIAN REGIONAL AIRLINE FOLLOWING A MERGER

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The present study examines the impact a merger had on pilot safety attitudes. Pre and post merger safety attitudes among a sample of Canadian pilots were examined using the Flight Management Attitudes Questionnaire 2.1 (FMAQ) (Merritt, Helmreich, Wilhelm, & Sherman, 1996) and the Flight Management Attitudes and Safety Survey (FMASS) (Sexton, Wilhelm, Helmreich, Merritt, & Klinect, 2001). Data were collected from 232 airline pilots prior to a large-scale merger using the FMAQ 2.1. Approximately 1 year following the merger, FMASS data were collected from the newly merged organization. We hypothesized that pilots' safety attitudes were negatively impacted due to uncertainty and organisational change following the merger. Results of the study indicate that post merger attitudes were significantly different on the teamwork, job attitudes and safety culture facets of the scale, however there were no significant differences in the stress recognition following the merger. In addition, the psychometric properties of the FMASS were examined. Implications for this study include understanding how change within an aviation organisation impacts safety attitudes thus impacting the overall safety culture of the newly created organisation.

Introduction

Literature on organizational mergers indicates that the nature of a merger can have either positive or negative impact on employee attitudes. Specifically hostile mergers or takeovers often foreshadow a decrease in employee attitudes towards job characteristics, work relationship satisfaction job security, organizational commitment (Newman & Krystofiak, 1993).

Fairfield, Ogilvie and DelVecchio (2002) also found that employee attitudes towards the organization and their jobs become significantly more negative following a hostile merger than those employees involved in a friendly merger. Specifically employees involved in the hostile merger had lower attitudes towards organizational commitment and job satisfaction (Fairfield and Ogilvie, 2002). Limited research is available on the impact of organization mergers of employees' safety attitudes. The potential impact of shifting attitudes towards safety can have serious implications on both the organisation and individual employees. Negative safety cultures and attitudes have been linked to various fatal organizational disasters (e.g. Chernobyl, Piper Alpha). Safety culture or attitudes is a key concept in understanding the role organizations play in major accidents and disasters. It is essential that organizations recognize and appreciate the importance of having and maintaining a positive safety culture especially after undergoing a major organizational change.

The current research will attempt to address this current gap in the literature by examining the mean differences in safety attitudes before and after a corporate merger. The current merger situation was not considered a hostile one, however the merger did involve a great deal of organizational restructuring (physically) and uncertainty regarding, relocation of staff, and layoffs and company future. It was hypothesized that safety attitudes among all levels of pilots were negatively impacted given the level of uncertainty surrounding the impact of the merger.

Evaluation of CRM Attitudes

Attitudes are not overtly observable, and must, therefore, be measured using either indirect methods such as behavioural observation or direct methods such as surveys or questionnaires (Azjen, 1991). The Flight Management Attitudes Questionnaire (FMAQ) (Helmreich, Merritt, Sherman, Gregorich, & Wiener, 1993) is the most commonly used measure of CRM

attitudes within the aviation industry. It is predominately used to evaluate the current status of safety attitudes and as a training evaluation tool (e.g., Salas, Fowlkes, Stout, & Milanovich, 1999). The original FMAQ was developed to specifically measure cockpit management attitudes and was therefore, referred to as the Cockpit Management Attitudes Questionnaire (CMAQ) (Helmreich, 1984). In 1988, a revised version of the CMAQ was developed because the existing version did not account for cross-cultural attitudes (Gregorich, Helmreich, & Wilhelm, 1990). The FMAQ was developed as an extension to the CMAQ, containing all of the original CMAQ items in addition to new items that were based on Hofstede's (1982) four dimensions of national culture (power distance, individualism, collectivism, uncertainty avoidance and masculinity-femininity) (Helmreich & Merritt, 1998). The original version of the FMAQ contained 82 Likert scale items, designed to measure pilot attitudes towards command, communication, stress, rules, automation, organisational climate and work values (Helmreich & Merritt, 1998). The questionnaire has since been revised including the FMAQ 2.0 international version and the FMAQ 2.1 USA/Anglo version and the Flight Management Attitudes and Safety Survey (FMASS). The FMASS was developed out of a need for a short version of the FMAQ (Sexton et al., 2001).

The FMASS contains four factors: safety culture, which is defined as "the extent to which individuals perceive a genuine and proactive commitment to safety by their organisation" (Sexton et al., 2001). The second factor is job attitudes, which are defined as "the level of satisfaction with the organisation and the individual's reactions to his or her job experience". Teamwork is the third factor and is defined as "the level of satisfaction with the quality of teamwork and cooperation experienced with other crew members, gate agents, ramp personnel, flight attendants, dispatch, maintenance, and crew scheduling" (Sexton et al., 2001). The final factor is termed stress recognition and is defined as "the extent to which individuals acknowledge personal vulnerability to stressors such as fatigue, personal problems and emergency situations" (Sexton et al., 2001, p. 5-9).

Methodology

Participants

Pre-merger. A total of 232 pilots voluntarily completed the FMAQ 2.1 (Helmreich et al., 1993) following Crew Resource Management (CRM) training sessions. The response rate for the pre-

merger was 90%. This sample contained only two bases located in one region of Canada.

Post merger. Following the merger all pilots from the newly created organization were surveyed following the merger. A total of 726 pilots voluntarily completed the FMASS following CRM training sessions, for a response rate of 75%. In total 204 participants from the original two bases of the pre-merger organization were surveyed in the second survey. Due to the fact that the questionnaires were completed anonymously it was not possible to link individual responses in the pre-merger survey to their responses in the post merger survey. Fortunately there were limited changes in personnel at the pre-merger locations, so it was possible to test for differences at the base level.

Measures

Pre-merger data was collected using the FMAQ 2.1 USA/Anglo version (Helmreich et al., 1993). Post merger data was collected using the FMASS (Sexton et al., 2001). Two different versions of questionnaires were used in the data collection however, only those items which were identical in both versions were used in comparing pre and post data. All of the items for the four factors that make up the FMASS were included in the FMAQ, therefore it was possible to look at differences in factor scores. All other items were excluded from the analysis. See table 1 for a list of items

Table 1. *Factors and Items*

Safety Culture
The managers in flight ops listen to us, and care about our concerns
I am encouraged by my supervisors and co-workers to report unsafe conditions
Management will never compromise safety concerns for profitability
My suggestion about safety would be acted upon if I expressed them to management
Job Attitudes
Working here is like being part of a large family
I like my job
Pilot morale is high
I am proud to work for this organisation
Pilots trust senior management at this airline
Stress Recognition
Personal problems can adversely affect my performance
My decision making abilities are as good in emergency situations as routine flying conditions

Table 1. *Factors and Items*

I am more likely to make judgment errors in an emergency
My performance is not adversely affected when I am working with a less experienced or less capable crew member
A truly professional crewmember can leave personal problems behind when flying
Teamwork Scale
Describe your personal perception of the quality of teamwork and cooperation you have experienced with the following
Other cockpit crewmembers
Flight Attendants
Dispatch
Crew Scheduling
Maintenance

Table 2. *Reliability coefficients*

Scale	Alpha
Pre-merger	
Teamwork	.77
Safety culture	.78
Job Attitudes	.79
Stress Recognition	.53
Post merger	
Teamwork	.69
Safety culture	.37
Job Attitudes	.77
Stress Recognition	.57

Data Analyses

Using Statistical Package for the Social Sciences (SPSS, 1999), the data were cleaned by examining minimum and maximum response values, ranges, means, standard deviations, skewness, kurtosis, and standardized scores. The data was also screened for univariate and multivariate outliers in addition to violations of assumptions.

Pre and post merger differences were examined using a Mann Whitney U non parametric test. This analysis was chosen due to sample limitations.

Results

Results of the Mann Whitney U tests indicate that there was significant difference in attitudes following the merger for three of the four FMASS factors. Specifically, safety culture attitudes became more negative ($Z = -8.00$, $p < .001$). Attitudes towards the quality and teamwork and cooperation also became more negative ($Z = -6.44$, $p < .001$). Similarly job attitudes also became significantly more negative following the merger, ($Z = -11.22$, $p < .001$). No significance difference in attitudes on the stress recognition scale (see figure 1). Reliabilities for each of the scales ranged from good .79 to poor .37 (see table 2 reliability coefficients).
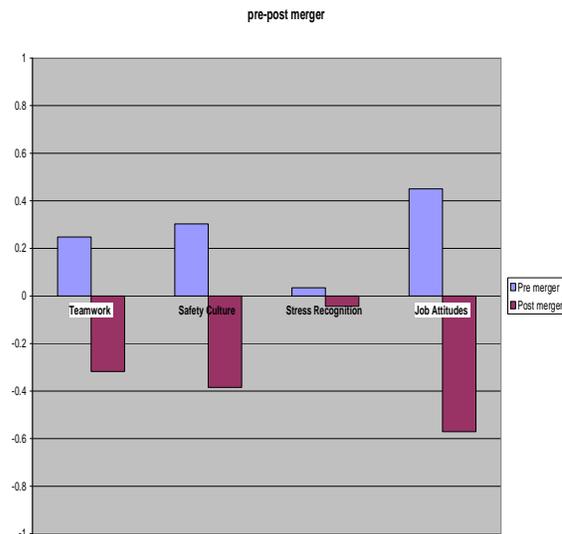

Figure 1. *Difference between pre and post merger.*

Discussion

The Airline industry currently faces significant challenges, with a number of major carriers either just emerging from bankruptcy protection or still in bankruptcy protection. To remain solvent companies have made pilots redundant and reduced salaries and benefits for those who remain. In some instances there has been uncertainty about pension entitlement. These challenges are likely to have an impact on pilot attitudes. Although the importance pilots place on safety is unlikely to change, their perceptions about management priorities is likely to be adversely effected.

The current study investigated the impact of a company merger on pilot attitudes. There was a significant mean difference in pilot attitudes following the merger. Specifically they were less positive about the safety culture, job attitudes and teamwork. This difference in pilot attitudes suggests

that organizational change and uncertainty can negatively impact pilot perceptions. It is therefore important to consider the mechanisms by which a merger can have such an impact.

The safety culture dimension measures pilots' perceptions about commitment to safety within the organization. It is likely that during a merger or any organizational change people focus on issues relating to the change, such as organizational structure and staffing. How people spend their time and what they speak about are two important indicators that people use to judge commitment to safety. For example if a manager never speaks about safety and dedicates their time solely to profit maximization then people will assume that safety is not a priority for them. During a merger it is likely that managers' time and energy will be focused on issues related to the change. The additional demand placed on managers' time means that are likely to have less time to devote to other issues, including safety. This does not mean that the managers think safety is unimportant, but when faced with other immediate demands their commitment to safety may become less visible. This is especially likely to happen in aviation since safety related incidents are relatively infrequent. It is therefore important for managers to be cognizant of this risk, so that they visibly demonstrate their commitment to safety to maintain a positive safety culture during a period of change.

Similarly, it is likely that pilots' satisfaction with the organization was adversely effected by the merger due to uncertainty and changes in management behavior. The loss of their previous corporate identity may also have had a negative impact. In general, mergers involve changes in the management structure, personnel and approach to staff management. In addition, mergers are often undertaken to achieve cost savings through personnel reduction. Therefore mergers are often associated with concerns about job security. It is therefore not surprising that pilot attitudes towards their organization were negatively affected by the merger. Although it is difficult for organizations to prevent pilots from being concerned about their job security, they should attempt to mitigate the negative impact by trying to maintain positive management-pilot relations during the period of uncertainty. This involves managers (who may be concerned for their own job) proactively working to maintain positive relations. Interventions could include holding open meetings where pilots can openly discuss concerns, and managers meeting with pilots in neutral settings (social events) to maintain an open dialogue. It may also be beneficial to introduce joint pilot-manager training programs, to promote open dialogue and an understanding of the challenges being faced by each group.

The negative impact that the merger had on team work is likely to be due to changes in personnel as the merger will have introduced team members from the previous organization. In addition, it is likely that the negative impact on culture and job attitudes will have had a knock on effect on perceptions of team work. For example, if dispatchers are also less satisfied with the organization, then this may have a negative impact on their performance.

Limitations & Future Research

The limitations with the current sample are the low level of reliability for the stress recognition scale prior to and following the merger. Additionally the reliability for the safety culture scale dropped significantly following the merger. Another limitation of this study is the inability to match individual pilot responses from the pre-merger sample with the post merger sample. Therefore the pre and post merger groups were treated as independent samples, yet in reality they were the same individuals, this violates the assumptions of independence required by many statistical procedures. This limitation was mitigated by using a very conservative statistical test. Future research should examine the psychometric properties of each of the individual subscales of the FMASS as well as the reliability for the entire scale. Additionally future research should examine whether there is a lasting impact of mergers on pilot safety attitudes.

References

Azjen, I. (1991). The theory of planned behaviour. *Organizational Behavior and Human Decision Processes, 50,* 179-211.

Fairfield-Sonn, J.W., Ogilvie, J.R., & DelVicchio, G. A. (2002). Mergers, acquisitions and long term employees attitudes. *Journal of Business & Economic Studies, 8*, 1-16.

Helmreich, R. L. (1984). Cockpit management attitudes. *Human Factors, 26,* 583-589.

Helmreich, R. L., Merritt, A. C., Sherman, P. J., Gregorich, S. E., & Wiener, E. L. (1993). The Flight Management Attitudes Questionnaire (FMAQ). NASA/UT/FAA Technical Report 93-4. Austin, TX: The University of Texas. [FMAQ 1.0 introduction 1993.pdf].

Newman, J.M., Krzystofiak, F. J. (1993). Changes in employee attitudes after an acquisition. *Group & Organization Management, 18,* 390-410.

Salas, E., Fowlkes, J. E., Stout, R. J., Milanovich, D. M., & Prince, C. (1999). Does CRM training improve teamwork skills in the cockpit? Two evaluation studies. *Human Factors, 41,* 326-343.

Sexton, J. B., Wilhelm, J.A., Helmreich, R.L., Merritt, A.C., & Klinect, J.R. (2001). Flight management attitudes and safety survey (FMASS). A short version of the FMAQ. University of Texas Human Factors Research Project Technical Report 01-01. [Safety Culture OSU 2001.pdf].