

Research about Safety Culture Perception and Safety Behavior of Members in Low Cost Carriers in Korea

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Abstract

Background/Objectives: Aviation safety would be different by safety behavior of members and there are needs to do research the perception of members about safety culture and atmosphere of low cost carriers. **Methods/Statistical Analysis:** Positive analysis of people who have been working in local low cost carriers had been done using Self-administered Questionnaire Survey Method through Convenience Sampling Method. And statistic things were treated by a statistic package program called "SPSS for Win 18.0". Plus, the analysis of data had been done by Descriptive Statistics and Multivariate Statistical Analysis. **Findings:** Firstly, It was found that all of factors in safety culture have given a meaningful effect into safety atmosphere. Analyzing it, it is natural that safety regulation culture to mainly think conducting duties based on rules influences the atmosphere to consider safety education and regulation of safety importantly. According to the test result of hypothesis 2, it was showed that all of factors in safety culture have given a meaningful effect into a safety behavior as well. It means that the culture to treat a safety as first priority when people work has an effect on safety behavior. Based on the test result of hypothesis 3, it was known that only factor of safety consensual give an effect on safety behavior. It has delivered that members in organizations have recognized safety consensual is the most important factor in safety behavior, especially more in low cost carriers' than major airlines. **Improvement/Applications:** Unlike other researches, detailed influences and relationship in various variables could be researched in this study. Through this research, it is concluded that it is difficult to find accurate and a variety of variables in existing researches. This report and result could be the starting point to explore deeper and wider relationship among variables for safety behavior.

Keywords: Safety Atmosphere, Safety Behavior, Safety Culture, Safety Perception

1. Introduction

Aviation safety would be different by safety behavior of the members in the aviation area. Especially, in the case of low cost carriers, they have been new trends of aviation industry but they have been doubted in the aspect of safety at the same time. Plus, the domestic line share of Korean low cost carriers has been extended into 53.6% and the international line share has become 13.2% in the first half year of 2015. In this situation, there is need to do research the perception of the members about safety culture and atmosphere of low cost carriers and the level of safety behavior based on them. So, the analysis of actual proof about the level of members' perception

about safety culture and atmosphere and how they would affect to personal safety behavior had been done in this research. A suggestion about the way of safety education to enhance the safety perception in the future would be offered.

2. Materials and Methods

In this research, positive analysis of people who have been working in low cost carriers of Korea had been done using Self-administered Questionnaire Survey Method through Convenience Sampling Method. And statistic things were treated by a statistic package program called "SPSS for Win 18.0". Plus, the analysis of data had been

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done by Descriptive Statistics and Multivariate Statistical Analysis.

2.1 Safety culture

Safety culture is not easy to change and has been formed by tons of changing activities in behavior and culture¹. Positive safety culture could provide an overall form of perception to induce a proper safety behavior². Safety culture is defined as a value, attitude, principle and perception of members to think safety importantly and safety perception and safety regulation were measured as two factors based on preceding researches.

2.2 Safety Atmosphere

Safety atmosphere is a part of psychological aspect in safety culture and it has shown how members would feel about safety³. Safety atmosphere was defined as the perception of safety standards, related procedures and customs. Since the extent of perception and observance about safety could be changed according to positions of respondents, it was measured considering organizational and personal factor as well⁴. Especially, safety atmosphere consisted of three factors as safety directivity, safety consensual and safety learning. Safety directivity is equal to the effort of management and employees for safety and safety consensual means communicating about and dealing with many issues related to safety through a variety of internal routes.

Lastly, safety learning consisted of safety education, safety regulation related to duty and work and procedure.

2.3 Safety Behavior

Safety behavior of workers in the organization is influenced by the sense of value including the intention to behave safely and culture and atmosphere in which they are belong⁵. Safety behavior was defined as the behavior to contribute to the safety of organization voluntarily following the safety culture and atmosphere in this research. Normally, it was defined that safety participation was not directly related to the safety but it is the action to participate into the education actively and that safety compliance is the activity to carry out the safety observing procedures and rules⁶. This research will measure safety behavior separating it into participation and compliance based on the advanced research.

3. Research Model and Hypothesis

Research model such as Figure 1 was designed for a purpose of this study and the following hypothesis was set up based on this research model. (Figure 1).

3.1 Research Model

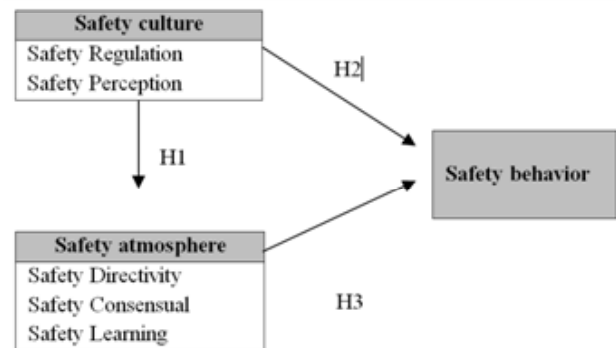


Figure 1. Research model.

3.2 Hypothesis

- H1 Safety culture would give the meaningful effect into safety atmosphere.
- H2 Safety culture would give the meaningful effect into safety behavior.
- H3 Safety atmosphere would give the meaningful effect into safety behavior.

4. Results

4.1 Demographic Character

300 questionnaires were distributed and inappropriate 53 of them excluded so, total 247 questionnaires for analysis were utilized. The number of male was 161 and the number of female was 66. Based on the age, 67 was in their 20's, 87 in their 30's, 45 in their 40's, 29 in their 50's and above 19 in their 60's. People in their 30's show the highest response rate as 35.2 Percentage. According to the kinds of department, 23 people belonged to sales management and 87 to maintenance department. 19 people worked in the operation control department, 25 people in safety security and 61 people in flight operation. 17 people worked in ground operation and 54 people in other departments such as catering or flight attendants. As for the working years, 79 people have worked less than 3 years and 59 people have worked 3

to 5 years. 44 people have worked 5 to 10 years and 65 people have worked over 10 years. The rate of employees who have worked over 10 years is the highest. When it is distinguished by the position, 77 people were under the manager, 47 for deputy section chiefs, 42 for section chiefs, 63 for head of department or deputy head of department and lastly, 18 people were executives. The response rate of group under manager was highest as 31.2 Percentage. When we gave the question about educational background, the number of people under high school was 10, people studying at University now are 4 and those for who graduated university were 210. 11 people were at graduate school and 12 people finished the procedure of graduate school. Most of respondents had the educational background as above the university.

4.2 Verification Result of Validity and Reliability about Measurement Tools

SPSS program was utilized in this research for verifying the validity and reliability. The value of Eigen was specified as 1 and rotation/spinning technique called 'Varimax' was used in factor analysis. A coefficient of Cronbach α was utilized for reliability analysis. As for the validity, the value of factor loading is made into standard, which is higher than 0.6. The value of Eigen over 1 was the standard value of factor extraction. The analysis result of reliability and factor analysis was produced like below tables. Specifically, in the case of safety atmosphere, the useful load factors in more than half of total questions in each safety directivity and safety consensual are over 0.6 which means the survey has the validity like Table 1. As

Table 1. Verification for reliability and factor analysis about safety atmosphere

Question list of Survey		Useful load factors	Variance explanation power (characteristic value)	Cronbach α
Safety Directivity	Employees report specifically when problems related to safety are occurred	.804	4.711 (24.795)	
	Management considers safety regulation and procedure importantly	.694		
	Management applies strict standards into safety problems	.629		
	Employees are reliable for procedure of accident investigation and cooperate positively	.629		
	Employees participate in setting the plan related safety	.624		
	Management handles safety problems quickly	.598		
	Company tries to improve the safety	.592		
	All of employees do their best in enhancing the level of safety	.547		
Safety consensual	Employees could catch safety improvement strategy from accidents investigation	.495	4.633 (24.383)	.960
	Employees communicate about the information related the safety each other	.823		
	Employees communicate well and frequently with safety manager	.810		
	Safety problems have been handled enough in the internal meeting	.712		
	Safety education and campaign related the safety have been practiced	.545		
Safety learning	Employees mention and communicate about safety problems often	.535	3.875 (20.393)	
	Safety regulation and procedure is protecting employees	.855		
	Safety regulation and procedure is consisted of appropriate materials and contents	.811		
	Safety is considered when the schedule of duty is made	.591		
	The issue related the safety is treated as first priority when the company provides training for employees	.539		
The contents about education and training of safety are easy to understand		.537		
KMO = .931, Sphericity verification of Bartlett =3992.138, Significance probability = .000				

for safety learning, useful load factors of two questions are higher than 0.8 and the rest are almost close to 0.6. With the Table 2, validity result was found based on most values of useful load factor which are higher than 0.7. When it comes to safety behavior, all of load factors have the value which is higher than 0.7 such as the detail value of Table 3. As the result of reliability analysis whether the statistical reliability of each measurement question is reliable or not, a coefficient of Cronbach α for all variables was above 0.8 like the value of Tables 1, 2 and 3, 4. The reliability is secured as the value which is higher than the normal reliability standard, 0.6.

4.3 Verification of Hypothesis

4.3.1 The Effect of Safety Culture into Safety Atmosphere

The effect of low cost carriers' safety culture into safety consensual of safety atmosphere had been analyzed. According to that result, the regression equation is meaningful because the value of R^7 which means the power of explanation about the overall model is 0.593, statistic value of verification F is 177.725 and p-value is 0.000. It is showed that both of safety regulation and safety perception which are two sub factors of safety culture give

the meaningful effect and the safety regulation has much effect than safety perception. In the case of the effect of low cost carriers' safety culture into safety directivity of safety atmosphere, it has the same result that the regression equation is meaningful. The value of R^8 is 0.652, statistic value of verification F is 228.969 and p-value is 0.000. However, in this result, the safety perception has much effect than safety regulation. When the effect of low cost carriers' safety culture into safety learning had been analyzed, this regression equation is also significant. The value of R^9 is 0.652, statistic value of verification F is 184.220 and p-value is 0.000. It is also showed that both of safety regulation and safety perception which are two sub factors of safety culture give the meaningful effect and the safety regulation have much effect than safety perception.

4.3.2 The Effect of Safety Culture into Safety Behavior

According to the result, the regression equation is meaningful because the value of R^{10} which means the power of explanation about the overall model is 0.321, statistic value of verification F is 57.571 and p-value is 0.000. It indicates that both of safety regulation and safety perception which

Table 2. Verification for reliability and factor analysis about safety culture

Question list of Survey		Useful load factors	Variance explanation power (characteristic value)	Cronbach α
Culture of safety regulation	Employees have been working with enough information related their duties	.846	3.299 (36.660)	.899
	Employees have reported effective situation to safety quickly	.771		
	There is a method to report anonymously problems related to safety	.742		
	The penalty has been applied when employees are violating the safety regulation	.737		
	Employees are having a knowledge about response procedure in the case of emergency	.657		
Culture of safety perception	Safety is considered importantly when employees have worked and made decisions	.870	2.826 (31.404)	
	Safety is considered importantly when the regulations for duty are being made	.823		
	Employees have participated in safety education regularly	.777		
	All employees and managers are handling the safety significantly	.571		
KMO = .873, Sphericity verification of Bartlett =1266.11, Significance probability = .000				

Table 3. Verification for reliability and factor analysis about safety behavior

Question list of Survey	Useful load factors	Variance explanation power (characteristic value)	Cronbach a
Safety equipment of company is checked and used for conducting duty safely	.846	4.326 (61.801)	.897
Employees have followed safety regulation and procedure strictly	.797		
Employees do their best and participate voluntarily for enhanced safety of the company	.791		
Employees have being encouraged to conduct duties safely one another	.784		
Employees have participated in safety activity of company positively	.782		
Employees do their best to work in the normal safety situation	.767		
Employees deliver the related information immediately to manager or superior office when the accident occurs in duties	.732		
KMO = .881, Sphericity verification of Bartlett = 915.468, Significance probability = .000			

Table 4. Regression analysis value to test the hypothesis

Category			Low Cost Carrier		
			Regression coefficient	t	p
Safety Consensual	←	Safety Regulation	.605	11.055	.000
		Safety Perception	.221	4.043	.000
Safety Directivity	←	Safety Regulation	.407	9.059	.000
		Safety Perception	.477	9.449	.000
Safety Study	←	Safety Regulation	.563	10.415	.000
		Safety Perception	.277	5.119	.000
Safety Behavior	←	Safety Regulation	.188	2.662	.008
		Safety Perception	.423	5.994	.000
Safety Behavior	←	Safety Consensual	.207	2.184	.030
		Safety Directivity	.190	1.611	.108
		Safety Learning	.098	.903	.368

are two sub factors of safety culture give the meaningful effect and the safety perception culture has much influence than safety regulation.

4.3.3 The Effect of Safety Atmosphere into Safety Behavior

According to the result, the regression equation is significant because the value of R^2 which means the power of explanation about the overall model is 0.212, statistic value of verification F is 21.820 and p-value is 0.000. But it shows that only safety consensual gives the meaningful effect among sub factors of safety atmosphere. Regression analysis value to test the hypothesis is as following Table 4.

5. Conclusions

Test result of hypothesis 1 showed that all of factors in safety culture have given a meaningful effect into safety atmosphere. Plus, it indicated that safety regulation culture gives stronger influence into safety consensual and safety learning and safety perception culture has been influencing strongly into safety directivity. Analyzing it, it is natural that the atmosphere to consider safety education and regulation of safety importantly influences safety regulation culture to mainly think conducting duties based on rules. The result that safety perception culture gives a higher influence into safety directivity plays a big

role in the atmosphere to build safety perception and voluntary participation of people in an organization. Safety directivity includes safety perception of management and voluntary participation of members. Therefore, it was found out that policy and practice of safety priority which is conducted by the management affected to voluntary safety behavior of members and it has become the most important factor to lead the aviation safety.

According to the test result of hypothesis 2, it was showed that all of factors in safety culture have given a meaningful effect into a safety behavior. It was indicated that safety perception culture gives a higher influence into safety behavior than safety regulation culture. This result means that the culture to treat a safety as first priority when people work and make a decision has an effect on safety behavior more than safety culture. So, there would be strong need to do voluntary action in safety behavior.

Based on the test result of hypothesis 3, it was known that only factors of safety consensual give an effect on safety behavior. It has delivered that members in organizations have recognized safety consensual is the most important factor in safety behavior, especially in low cost carriers' relatively poorer environment of safety management than major airlines. It was accepted that this difference was caused by the scale of organization and the difference of operation period.

After the preceding research progressed about variables for this research, the need about research and study of variables related to the safety is recognized in the end as there is a shortage of related research in the aviation field unlike other different fields and preceding researches about these variables are insufficient. Especially, follow-up studies must be continued to provide factors in which airline companies have to focus for the aviation safety by finding variables which could influence into safety behaviors.

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