

Aviation Safety Locus of Control - A Preliminary Study in Indian Military Pilots

Ayengar P D*, Catherine J⁺

ABSTRACT

The present study was carried out to study the Aviation Safety Locus of Control (LOC) in medically fit and unfit Indian Military Pilots. 61 male pilots from all the four services, including the Indian Coast Guard within the age range of 20 – 40 years constituted the study sample. The subjects were divided into medically fit (n: 31) who were in active flying and medically unfit (n: 30) who were not flying due to medical reasons. All the subjects were given Aviation Safety Locus of Control questionnaire. The data was analysed using student's 't' test. On the variables of Aviation Safety LOC the combined scores of both the groups of pilots showed them to be higher on the internal and the combined scale of the Aviation Safety LOC whilst, they were lower on the external LOC. The Student's 't' test results between the two groups on the Aviation Safety LOC showed significantly higher external LOC score in the medically fit group (26.90 ± 3.85) than in the medically unfit group (24.96 ± 4.00) ('t' value= 1.92, $p < 0.05$). This difference was possibly due to age differences between the two groups and not due to medical categorization.

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Introduction

The psychological attribute Aviation Safety Locus of Control (LOC) has been shown to be linked to flying performance and therefore have a bearing on flight safety and mission effectiveness. The extent to which an individual perceives control over events to be under his own influence is referred to as LOC [1]. The term refers not only to specific situational appraisals but also to basic attitudes concerning the effects of one's own behavior. A similar concept has been utilized in the aviation environment where it has been shown that pilots exhibited higher levels of internality than externality on a modified scale. Pilots with a more internal LOC were known to be involved in a fewer hazardous aviation events than pilots with an external LOC. Hazardous attitudes are also related to pilots who have a more external oriented LOC, they have been found to be higher on the 'resignation' score [1]. The present study was carried out to study the Aviation Safety LOC in Indian military pilots and also to see whether there

is any difference in the same in medically fit and unfit groups.

Materials and Method

61 male pilots in the age group of 20 – 40 years participated in the study. The pilots were divided into two groups, one group (n: 31) consisted of pilots who were in active flying with full or restricted flying category and the other group (n: 30) were pilots who were not flying and were in ground category. The sample was homogenous, collected from the MEC of the IAM, IAF and from pilots who came for the DISO course in the Department of Acceleration and Vestibular Physiology. Pilots who had a psychiatric illness were excluded from the study. Pilots were subjected to psychological testing at the Dept of Aviation Psychology on a single day after taking their willingness to participate in the study.

* *Graded Specialist Aerospace Medicine, INS Garuda, Kochi*

+ *Scientist 'F', Professor and HOD, Department of Aviation Psychology, IAM, IAF, Bangalore – 17*

The questionnaire for the study used was Aviation Safety Locus of Control developed and validated previously on both civil and military pilots. Aviation Safety Locus of Control provides measures of the LOC which can be either internal, external or a combined factor. The test also provides a measure of test consistency and LOC stability. The inventory consists of 20 statements relating to LOC with two scales (internal and external) each with 10 items. The subjects were instructed to answer the questions in such a way how much they agreed or disagreed with each statement on a five point 'Likert' scale from "strongly agree", "agree", "neutral", "disagree", and "strongly disagree" and to mark the point on the scale. The subjects were instructed to give their first and natural response to the statements and answer them carefully and truthfully. The subjects were then instructed, on not being able to understand the question they could note down the numbers and could clarify at the later session on the unanswered questions with the examiner, as no statements were supposed to be left unanswered.

Previous studies using this test have shown that the pilots exhibited higher internality than externality and the two subscales exhibited acceptable internal consistency and were negatively correlated ($r = -0.419, p < 0.001$). Construct validity has been assessed by comparison of the combined and separate scales with the resignation scores from the Hazardous Attitudes Inventory (HAI) and with a measure of involvement in hazardous aviation events [2]. The combined scale score showed a significant correlation with involvement in hazardous events. The internality score was found to be significant and negatively correlated with involvement in hazardous aviation events. The externality score was found to be significantly and positively correlated with the resignation score from the HAI.

Aviation Safety LOC scale is easy to administer and can be given either individually or to a large group. On an average 20 minutes was required to complete this test.

Results

On the variables of Aviation Safety LOC the combined scores of both the groups of pilots showed them to be higher on the internal and the combined scale of the Aviation Safety LOC whilst, they were lower on the external LOC.

The Student's 't' test was done subsequently to analyze the variables of the Aviation Safety LOC between the medically fit and the unfit group of the pilots to see if there were any significant differences.

The Student's 't' test results between the two groups on the Aviation Safety LOC showed significantly higher external LOC score in the medically fit group (26.90 ± 3.85) than in the medically unfit group (24.96 ± 4.00) ('t' value= 1.92, $p < 0.05$) as shown in Fig 1.



Figure 1. Comparison of Aviation Safety LOC in medically fit and unfit groups.

Discussion

The Aviation Safety LOC was analyzed and the combined score in the three sets of variables in all pilots showed higher scores of internal and combined sub scales of the Aviation Safety LOC, and a lower score on the external LOC. This is in

Table 1. Differences between medically fit and unfit groups on the variables of Aviation Safety LOC.

Variables	Group	N	Mean	SD	't' value	Significance
Internal	1= Medically Fit	31	33.16	4.96	-1.37	0.17
	2= Medically unfit	30	34.96	5.26		
Combined internal mean	1 and 2	61	34.04	5.15	1.92	0.05
External	1	31	26.90	3.85		
	2	30	24.96	4.00		
Combined external mean	1 and 2	61	25.95	4.01		
Combined	1	31	58.87	7.84	-0.09	0.92
	2	30	59.06	9.10		
Combined mean	1 and 2	61	58.96	8.42		

line with the previous studies done by authors (2,3) where the scores for the internal LOC in the civil pilots were higher than the external LOC. The findings of the present study are also consistent with an Indian study on the Aviation Safety LOC in both the civil and the military pilots (4). In another Indian study, done at IAM, IAF Indian military pilots (5) were seen to be more internal in LOC on the Levenson's LOC scale especially when they perceived occupational stress. Therefore, the results of the present study carried out exclusively in Indian military pilots are similar with earlier studies on the Aviation Safety LOC both in military and civil pilots.

There were significant differences noticed in both groups on Aviation Safety LOC. On comparison between the two groups of medically fit and unfit, the external LOC score had a higher mean in the medically fit group. The reason for the difference could be explained because of the lesser mean age of the fit pilot sample in the present study who had less experience and service and possibly perceived less control over flying situations. Other studies found that pilots become more internal and less external as they grow older (2,3).

Conclusion

Aviation Safety LOC is important in flying performance and therefore influences flight safety.

Review of the worldwide literature reveals that being more external in Aviation Safety LOC contributes to more flying accidents. In the context of the results analysed in the present study, it can be extrapolated that pilots who come for initial selection can be assessed on those personality characteristics which are related to an internal LOC. The LOC can be modified / influenced during the career through training programmes to decrease the risk of flying accidents and incidents thus improving flight safety.

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