

## **A Study of State Anxiety During Different Periods of Eleventh Antarctic Expedition**

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### **Abstract**

State anxiety scores of 15 expeditioners in three different periods (journey from India to Antarctica, living in Antarctica, and journey from Antarctica to India) were examined through analysis of variance with repeated measure. Expeditioners on their way to Antarctica from India, reported more anxiety than in other two periods. Through analysis of covariance, items measuring security feeling and rested state were identified as most discriminating items in three different periods. These two items predicted total scale score significantly. Results have some implication on training design for expeditioners.

### **Introduction**

State anxiety refers to transitory emotional state or condition of the human organism that is characterized by subjective, consciously perceived feelings of tension and apprehension and autonomic nervous system activity (Spielberger et al., 1970). State anxiety varies in intensity and fluctuates over time. This fluctuation depends upon the extent to which a specific situation is perceived by individual as dangerous and threatening and this is greatly influenced by individual's past experience. Environment of Antarctica is threatening for human existence. Ninetyeight percent of landmass of Antarctica is covered with snow and ice and the remaining area is rocky. Antarctica is devoid of vegetation and is relatively isolated from human activities. The temperature prevailing in the continent are on an average ranging between  $-30^{\circ}$  and  $-50^{\circ}\text{C}$  in winter and around  $0^{\circ}$  to  $-10^{\circ}\text{C}$  in summer. Johnson (1985) found that the average temperature is  $-50^{\circ}$  on the polar plateau and  $-15^{\circ}\text{C}$  in the coastal areas. There is excessive ultraviolet radiation which affects the human body adversely. Several studies (Mullin, 1960, Palami, 1963 and Bell & Garthwaite, 1987) reported cases of psychological disturbance in Antarctica. Focus of the present research is to determine differences in state anxiety patterns of Antarctic expeditioners in three different phases viz. during journey from India to Antarctica, at Antarctica

and during return journey from Antarctica to India. To assess the state anxiety level, Spielberg's state anxiety scale is assumed to be appropriate. Aim of this study is to determine usefulness of state anxiety scale in Antarctica. The scale includes 20 items. Another purpose of the present study is to determine significant differences in scores of 20 items in three different stages of the expedition.

## Methods

*Sample:* Data were collected from 15 expeditioners (mean age = 35.03, SD = 9.70) who left for Antarctica on 27 November 1991 and safely returned to India on 4 March 1992. Purpose of their visit was to conduct research work in Antarctica. They were given initial training so that they could adjust with the environmental uncertainty in Antarctica.

*Tools:* Data were collected through state anxiety scale (Spielberger et al., 1970). Twenty items of the scale measure the degree to what extent respondent feels tension, nervousness, worry and apprehension at a particular moment in time. Test- retest reliability of the scale is low as state anxiety varies from time to time. Concurrent and construct validity of the scale are very high (Spielberger et al., 1970). In this study alpha cronbach was used to assess internal consistency among the scores of items in three different periods. It was found that alpha value ranged from 0.75 to 0.85 (Table I). Higher score indicates comparatively higher state anxiety levels and vice versa.

## Results

### *Differences in state anxiety*

The technique of analysis of variance with repeated measures was applied to determine significant difference in state anxiety score of three different periods. Table I shows mean and standard deviation (SD) of the items of state anxiety scale in three different periods. State anxiety mean during journey from India to Antarctica (mean = 36.40, SD = 4.80) was significantly higher ( $F = 11.65$ ,  $df = 2,42$ ,  $p < .0001$ ) than those in other two periods. In contrast, state anxiety mean during journey from Antarctica to India (mean = 28.37, SD = 4.86) was significantly lower than those in other two periods (Table I).

Out of 20 items of the state anxiety scale, only nine items were significantly different in three different periods of the Antarctic expedition. These items were feeling of calmness ( $F(2,42)=9.01$ ,  $p < .0006$ ), security ( $F(2,42)=13.20$ ,  $p < .0000$ ), rested ( $F(2,42)=8.42$ ,  $p < .001$ ), comfortability ( $F(2,42)=8.40$ ,  $p < .0009$ ), confidence ( $F(2,42)= 12.02$ ,  $p < .0001$ ), relax ( $F(2,42)=3.95$ ,  $p < .03$ ),

**Table I: Analysis of Variance and Chronbach's Alpha of the State Anxiety Scale**

Items	Journey from India to Antarctica		Living in Antarctica		Journey from Antarctica to India		F DF=2,42	Level of Significance	
	Mean	SD	Mean	SD	Mean	SD			
<b>Feelings of</b>									
1	Calmness	2.43	0.49	1.71	0.64	1.57	0.65	9.01	.0006
2	security	2.40	0.54	1.49	0.55	1.47	0.61	13.20	.0000
3	tense	1.20	0.32	1.37	0.42	1.30	0.41	0.71	NS
4	regret	1.40	0.51	1.34	0.44	1.33	0.45	0.09	NS
5	ease	2.30	0.49	2.15	0.60	2.00	0.53	1.14	NS
6	upset	1.17	0.31	1.27	0.53	1.13	0.23	0.51	NS
7	worry	1.43	0.59	1.18	0.21	1.23	0.37	1.50	NS
8	rested	2.27	0.53	2.56	0.61	1.73	0.45	9.10	.0001
9	anxious	1.87	0.91	1.91	0.62	1.77	0.75	0.13	NS
10	comfortable	2.20	0.56	1.85	0.48	1.43	0.49	8.40	.0009
11	self confidence	2.27	0.59	1.65	0.46	1.40	0.43	12.02	.0001
12	nervous	1.06	0.26	1.27	0.42	1.07	0.26	1.91	NS

A Study of State Anxiety During Different Periods ...

(Contd.)

Table I — *Contd.*

13	jittery	1.27	0.53	1.44	0.43	1.30	0.45	0.57	NS
14	high-strung	1.43	0.88	1.30	0.42	1.33	0.49	0.18	NS
15	relaxed	2.30	0.62	2.05	0.51	1.70	0.62	3.95	.03
16	content	2.47	0.64	2.02	0.52	1.87	0.55	4.45	.02
17	misfortune	1.17	0.31	1.16	0.26	1.03	0.30	1.02	NS
18	overexcited	1.47	0.61	1.43	0.55	1.10	0.21	2.55	NS
19	joyful	2.23	0.70	1.95	0.56	1.40	0.47	7.81	.0013
20	pleasant	2.06	0.65	1.65	0.49	1.20	0.37	10.50	.0002
	<b>Total score</b>	<b>36.40</b>	<b>4.80</b>	<b>32.73</b>	<b>3.96</b>	<b>28.37</b>	<b>4.86</b>	<b>11.65</b>	<b>.0001</b>
	<b>Chronbach's alpha</b>	<b>0.75</b>		<b>0.72</b>		<b>0.85</b>			

content ( $F(2,42)=4.45$ ,  $p<.02$ ), joyful ( $F(2,42)=7.81$ ,  $p<.0013$ ) and feeling of pleasantness ( $F(2,42)=10.50$ ,  $p<.0002$ ) (Table I). Scores of these items were significantly higher during journey from India to Antarctica than during other two periods.

#### *Identification of most discriminating items*

Analysis of covariance was used to determine most discriminating items. In Table I, it was found that only nine items of the state anxiety scale were significantly different in three different periods of Antarctic expedition. Of these nine items, only six items viz. feelings of calmness ( $F(2,8,34)=4.26$ ,  $p<.02$ ), security ( $F(2,8,34)=3.32$ ,  $p<.03$ ), rested state ( $F(2,8,34)=8.42$ ,  $p<.001$ ), relaxed state ( $F(2,8,34)=5.81$ ,  $p<.001$ ), joy ( $F(2,8,34)=4.49$ ,  $p<.02$ ) and pleasantness ( $F(2,8,34)=4.45$ ,  $p<.02$ ) were found significantly different in three different periods when eight items were taken as covariates (Table II). Gradual decrease in level of state anxiety indicates high adaptive capacity of expeditioners with uncertain environment of Antarctica. In another study, Dutta Roy (1993) using 16 P.F. found that expeditioners were optimistic, cheerful, self sufficient and adaptive.

Kaplan and Sadock (1988) have stated that at a lower level, anxiety prompts an individual to take necessary steps to prevent threat or at least to lessen its consequences. In the present study, state anxiety means in three different periods never crossed 40.00. It indicates low anxiety level. Possibly, for low anxiety level, expeditioners were able to cope with the uncertain environment of Antarctica. Spielberger et al.(1970) found that in male samples, average state anxiety score was 40.00 with SD 7.85 and in patients with anxiety reactions it was 49.02 with SD 11.62.

Two anxiety variables like feelings of security, and of rested state seem to affect more on the state anxiety level of expeditioners in three different periods. Expeditioners reported more insecurity on their journey from India to Antarctica. In personal interview, expeditioners identified three determinants viz. high wind speed, wild animals like whales, sharks and height of sea waves, for their insecurity feeling. Expeditioners reported less relaxed state during journey from India to Antarctica and during living in Antarctica. However, they were more relaxed when they were on their way back to India. Soon after leaving Indian shore, scientist expeditioners started their work i.e. data collection. It was continued till the time they returned from Antarctica. Environmental disturbances often affected their data collection adversely resulting in a less rested state during first two periods compared to the last phase of the expedition.

The results which support usefulness of Spielberger's state anxiety scale, seem to have some implication on expeditioners training design. Training

**Table II: Analysis of Covariance of Each Significant Item When Other Eight Items Were Covariates**

Items	F df=2,8,34	Level of Significance
Feelings of		
1 Calmness	4.26	.02
2 security	3.32	.03
8 rested	8.42	.001
10 comfortable	0.07	NS
11 self confidence	1.05	NS
15 relaxed	5.81	.001
16 content	0.67	NS
19 joyful	4.49	.02
20 pleasant	4.45	.02

**Table III: Analysis of Covariance of Six Items When Nonsignificant Items (Feeling of Comfortability, Confidence,Content) Were Covariates**

Item	F df=2,3,39	Level of Significance
Feelings of		
1 Calmness	1.82	NS
2 security	3.35	.04
8 rested	6.72	.00
15 relaxed	0.62	NS
19 joyful	2.10	NS
20 pleasant	1.04	NS

programme which is based on some fundamental techniques of mountaineering provides an opportunity for the expeditioners to experience various snow/ice conditions and, of course low temperatures. Perhaps that is why they did not report high anxiety when they were actually in Antarctica. On the other hand, during their training, they never experienced wild sea animals like whales or sharks, high oceanic winds, high rise sea waves or floating icebergs. Possibly for this reason they reported more anxiety during sea journey.

In order to help the scientist expeditioner, while on sea, to collect data with reduced anxiety, trainer may introduce role playing method in stormy ocean or in simulated environment of Antarctica. In this role playing method, expeditioners will collect data about different environmental changes when environmental disaster takes place.

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