

PSYCHOLOGICAL STUDIES IN THE ANTARCTIC

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ABSTRACT. The psychological characteristics of 76 members of the British Antarctic Survey have been assessed from the returns of the "likes and interests" questionnaire.

Analysis of the scores shows that there are large differences between individuals; all psychological characteristics are represented and the overall results resemble those obtained from student populations.

The characteristics of those who were judged to be outstanding were compared with those considered to be failures. The main difference, as revealed by the questionnaire, was that the outstanding men were highly tolerant of others; the failures were intolerant.

THERE are many reasons why studies of human behaviour and of personality should be carried out in the Antarctic. What are the effects of the unusual environment, frequently uncomfortable and always potentially dangerous? Are the accounts of mid-winter depression only myths; if not what causes such depression? How do very small groups, ten men or even less, manage their inter-personal relationship when they are isolated for periods up to a year? Many with Antarctic experience would be prepared to deal with some or all of these questions; but the answers given by different experts are frequently different. These are hard questions, since the information needed is not easy to obtain. A number of countries maintaining stations in the Antarctic have undertaken psychological studies, notably the Americans under the direction of Dr. E. Gunderson. His main concern has been to improve selection, so avoiding the menace of the misfit and increasing the prospects of well-balanced team. He and his colleagues have achieved considerable success.

Although selection tests and procedures are important, the studies leading to changes in selection also provide some answers to the questions posed above. Mid-winter depression is common (in American Antarctic stations); although the causes are far from clear, it is evident that some personality types are more vulnerable, and exclusion of such individuals would probably be helpful.

One of the obvious difficulties of carrying out psychological work in the Antarctic is that the observer (the psychologist) is also subjected to the trials and hardships of Antarctic life. He too may become depressed, have problems with sleeping, find his companions wearisome, and so his observations become biased. One way of avoiding such bias is to examine people before and after a period in the Antarctic to find if they have altered in particular ways, and preliminary even to this is the need to know more about the people who do go south. What are their personality characteristics; are they a highly selected group with particular well-marked traits or are they characteristic of the population as a whole? Are they very diverse or do they resemble each other in quite specific ways? However, the first question really is: would members of the British Antarctic Survey agree to co-operate in any psychological study?

This paper contains an account of a preliminary study undertaken during a visit to the Antarctic. A questionnaire was administered known as the "likes and interests" questionnaire. The answers given can be used to score the individual on a large number of psychological characteristics.

Most of the work of administering the questionnaire was done on board R.R.S. *Bransfield*; in addition, when time permitted, members of stations visited who were remaining in the Antarctic also acted as subjects. A total of 77 members of the Survey completed the questionnaire, designed by Grygier (1961). The tests were later scored in London, and the data were collated and analysed by C. de Monchaux and A. Davis.

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Acceptability

RESULTS

Only one individual of the 78 approached refused to complete the questionnaire. Considerable time was spent explaining the reasons for the study; it was made clear that the individual results would be kept confidential although a report such as this would be prepared. A number positively welcomed the purpose of the questionnaire, namely the initiation of psychological studies amongst members of the Survey's stations.

Distribution of answers

The 29 variables or personality characteristics which can be scored from the answers given are shown in Table 1. In order to compare the results obtained with other studies (using the "likes and dislikes" questionnaire), a principal component factor analysis was carried out on these 29 variables. Eleven factors were extracted (see Table II), and these proved to have a good deal of correspondence with the factors identified by Stringer (1970) in a study of 357 male students of art, architecture or engineering and also by Kline (1968) using results obtained from 70 training college students.

Relationship between answers and performance

The subjects were rated (by O.G.E.) and put into three groups: outstanding (or very satisfactory), as judged by peer rating; failures (unsatisfactory), and the rest who were all considered to be satisfactory. This rating was crude but it was used to determine whether the results of the questionnaire could distinguish these three groups.

Table I shows the mean and standard deviation of scores for the 29 characteristics in the three groups (see Table III).

There is considerable overlap of the scores for the three groups; group 2 (unsatisfactory) has only four members and hence has a large confidence interval associated with it. Variable 15, which indicates intolerance does, however, discriminate in that group 1 (very satisfactory) has lower scores than group 0 or group 2. The (unsatisfactory) group 2 subjects have higher scores than either group 0 or 1 for intolerance. The only other significant variable, 5, indicating emotional dependence, shows group 1 having higher scores than group 0, although the four group 2 subjects have a wide range. A step-wise discriminant analysis was carried out; by this technique the variable is selected which shows the greatest difference between the groups. Then the remaining variables are examined and the one which in its turn displays the largest difference is identified. The first step showed that variable 16 (intolerance) discriminated significantly between the three groups, followed by variable 21 in step 2. The best discrimination was achieved using 11 variables and this succeeded in classifying 4/4 in the unsatisfactory group, 9/10 of the very satisfactory and 47/63 satisfactory subjects. None of the very satisfactory was classified as unsatisfactory but seven of the satisfactory groups were so mis-classified.

According to this analysis, the unsatisfactory subjects were more socially mistrustful and intolerant, more anxious about emotion and sensual enjoyment (of nature as well as of people), had more rebellious attitudes to authority, were more lacking in independence, and had high scores for exhibitionism and social extraversion.

Those who were rated as very satisfactory were, in comparison with others, more tolerant of those who differed from them, perceptive of and sensitive to sensual impressions, prepared to accept authority rather than rebellious, not particularly interested in making things, liked change and risk, and were fascinated by height, space and distance, scored high for independence and high for emotional attachment to others, scored low for exhibitionism and for expressed interest in active pioneering exploration. This group appears to consist of people with strong emotion who are in good control of themselves, not acting out childhood conflicts over parental authority or compensating for inadequacies by showing off to others at a superficial level.

TABLE I. MEANS AND S.D.'S: AGE+29 LIKES AND INTERESTS TEST VARIABLES FOR 77 BRITISH ANTARCTIC SURVEY SUBJECTS

<i>Personality characteristic</i>	<i>Variable</i>	<i>Mean</i>	<i>S.D.</i>
	1 (Age)	25.402328	7.021130
Hypocrisy	2 (Hyp)	11.688293	3.245470
Passivity	3 (WP)	6.740242	2.769189
Seclusion	4 (WS)	6.714268	1.904680
Oral aggression	5 (OA)	6.857124	2.037242
Emotional attachment	6 (Od)	6.428555	2.556859
Independence	7 (Om)	8.714269	3.008120
Self assertion	8 (Ov)	6.519462	2.774920
Impulsiveness	9 (Oi)	6.155828	2.481840
Unconventional	10 (Ou)	7.038945	2.353270
Hoarding	11 (Ah)	5.090893	2.248858
Attention to detail	12 (Ad)	7.909072	2.879961
Conservatism	13 (Ac)	5.012973	1.983431
Submission to authority	14 (Aa)	3.480502	1.882118
Authoritarian	15 (As)	3.233749	2.145339
Intolerance	16 (Ai)	3.909077	2.428881
Narcissism	17 (pn)	6.584399	2.876160
Exhibitionism	18 (Pe)	4.389595	2.956494
Adventurous	19 (Pa)	9.779202	3.362409
Love of heights	20 (Ph)	7.909073	1.836627
Sensual	21 (Pt)	8.415565	1.672930
Physical activity	22 (Pi)	11.116864	2.265144
Tactile enjoyment	23 (TI)	6.753228	3.018158
Creativity	24 (CI)	7.194789	3.268814
Masculinity	25 (M)	11.493486	3.181444
Femininity	26 (F)	6.545440	3.518904
Social activities	27 (SA)	7.337646	3.226564
Interest in children	28 (C)	6.532451	3.672730
Egotism	29 (EP)	6.337643	1.619049
Initiative	30 (EI)	16.285492	5.031089

TABLE II

<i>Factor</i>	<i>Suggested interpretation</i>
1	Active, adventurous, masculine creativity
2	Independence, self-assertive need for action and autonomy
3	Enjoyment of seclusion and intimate contact with nature
4	Authoritarian personality pattern
5	Social compliance and feminine identification
6	Tenacity of purpose, consistent effort in face of difficulties
7	Fascination by height, distance. Sensuality and sensitivity
8	Love of passive comfort
9	Outgoing masculine leadership
10	Narcissism and exhibitionism
11	Possessiveness and orderliness

The results derived from the questionnaire were also used to find out if there were differences between stations, or in terms of occupation and education; cluster analysis and discriminant analysis were used.

TABLE III

<i>Number</i>	<i>0 Satisfactory</i>	<i>1 Very satisfactory</i>	<i>2 Unsatisfactory</i>
	63	10	4

Cluster analysis involves a comparison of individuals, by assessing the similarity or difference of each individual in relation to all the others, in terms of the characteristics revealed by the questionnaire. The 11 factor scores for each of the 77 subjects were used to compute distance scores for each individual from every other person, so each subject had 76 distance scores.

The discriminant analysis was performed using the 11 factor scores for each subject, and examining which factors or combination of factors were most effective in distinguishing between (1) different stations, (2) years in the Antarctic, (3) occupation and (4) education.

Amongst the results from these analyses it was shown that the members of the stations at Signy Island and South Georgia resembled each other most closely. Signy Island, in turn, was fairly similar to the Argentine Islands but it was significantly different from Adelaide Island, Stonington Island and Halley Bay. It will be evident that the members of the British Antarctic Survey serving at similar stations such as Signy Island and South Georgia resembled each other, and differed from those at Adelaide Island, Stonington Island and Halley Bay. The latter stations are concerned not so much with biological work as with survey, glaciology and geology.

DISCUSSION

Some of the questions posed in the introduction can be answered. It was quite clear that the questionnaire was acceptable and that, in the individual discussions which followed the

completion of the questionnaire, the majority expressed interest and a number welcomed the proposal of psychological study in the British Antarctic Survey stations. Nevertheless, there were several who expressed some reserve and were critical of the use of such questionnaires as part of a selection process.

The replies to the questionnaire were in many respects similar to those already published for students, both in University and at Teaching Training Colleges. This finding confirms that the Survey draws its members from a wide range of the population. Further support for the conclusion that the Survey's members resemble the population from which they are drawn is to be found in the large standard deviations for the mean scores on each of the 29 individual personality characteristics, implying a wide individual variation (see Table I).

It is a vindication of this particular questionnaire that, by examining the individual scores and identifying the significant factors, it was possible to select the most satisfactory subjects and to separate them completely from the unsatisfactory. It should be pointed out that the rating system used was crude and could be improved. Many of the findings would be regarded as self-evident by those with experience of the British Antarctic Survey and the characteristics of the different stations. Nevertheless, it must be stressed again that these findings were obtained by examining the questionnaire results and were not in any way affected by direct experience of members of the Survey of the British Antarctic Survey itself, or indeed the Antarctic. Encouraging though these results may be, it would be essential to get much more information before proposing that such questionnaires might form part of the selection procedure.

There have been extensive studies of Antarctic personnel at United States stations, and the results have been summarized by Gunderson (1973). He has developed effective selection techniques and identified the most relevant personality characteristics, both desirable and undesirable. There is considerable agreement between his findings and the results of the present study. These are amplified by the opinions expressed by members of the Survey returning from the Antarctic. Specifically, it is widely agreed that the intolerant individual is unlikely to be a satisfactory member of an Antarctic station.

Although it is obvious that a questionnaire technique cannot be used to solve or to study all the psychological and psychophysiological problems in the Antarctic, the results obtained in this pilot investigation demonstrate the usefulness of such a technique. It has the merit of being non-obtrusive, and can be administered on board ship, without interfering with work. Hopefully, future generations of members of the British Antarctic Survey will be as co-operative and interested as those on board *Bransfield*.

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