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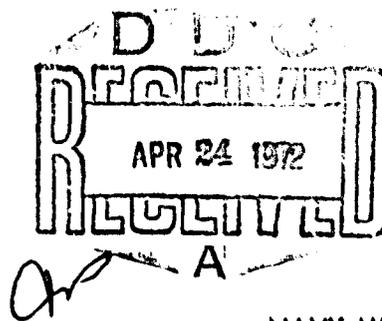
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GROUP SIZE AND LEISURE ACTIVITY BEHAVIOR AMONG ANTARCTIC VOLUNTEERS

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9. ABSTRACT
Questionnaires indicating amount of time spent in each of 20 leisure activities were administered on two occasions, early winter and late winter, to 171 Navy enlisted men and 103 civilian scientists who were assigned to Antarctic stations for one year. Station sizes ranged from 8 to 30 members, and groups were divided into two categories by size. The most striking finding was the relatively low level of leisure activities at the smaller stations. It appeared that larger stations afforded more recreational facilities and also more opportunities for social interactions.

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Group Size and Leisure Activity
Behavior among Antarctic Volunteers*

Richard E. Doll and E. K. Eric Gunderson

A recent study by Doll and Gunderson (1970) indicated that the organizational size of Antarctic stations was related to the members' perceptions of group compatibility and group accomplishment. The findings suggested that the larger stations were more compatible and effective than smaller stations. Such results do not conform to those reported in other studies where small group size has consistently correlated with member perceptions of greater cohesiveness or compatibility (Viteles, 1953; Seashore, 1954; Thomas and Fink, 1963), and to a lesser degree small size has been seen as positively related to group achievement (McGrath and Altman, 1966).

While these findings by Doll and Gunderson tended to contradict other results, it must be emphasized that the Antarctic stations are unique organizations in a unique environment. Once the winter darkness begins temperatures may plummet below -100°F forcing virtually all activities indoors. Supplies cease coming in, and, except for occasional radio communication, the men are completely isolated from the outside world for approximately seven months in a physically and socially restricted environment. As Quinn and Kahn (1967) point out it is precarious to generalize the findings from one type situation to another, and that there are too few studies available of total organizational size in vivo to justify firm generalizations.

Although it has been demonstrated that certain attitudes vary with the organizational size of Antarctic stations, it has not been shown for this situation what kinds of overt behavior also vary with organizational size.

The present study attempts to explore the leisure activity behavior of those volunteers assigned to stations consisting of 8 to 11 members as opposed to those stations consisting of 20 to 30 members.

METHOD

Subjects. The subjects for this study consisted of 171 Navy enlisted men and 103 civilian scientists who wintered-over at one of the small stations between the years of 1964-68, inclusively. All subjects were volunteers who had been selected for Antarctic duty primarily on the basis of occupational competence. The Navy enlisted men had a mean age of 27.3 years; 59% were high school graduates. Civilians had a mean age of 27.6 years and 66% were college graduates.

Procedure. The data were those collected from five stations covering the years 1964-1968. The stations were divided into two categories of station size, viz., large versus small. The small stations ranged in size from 8 to 11 members while the large stations consisted of 20 to 30 members.

Questionnaires were administered on two occasions during the year of duty in Antarctica. The first administration was early in the period of winter isolation (March) and the second near the end of the winter isolation (September). Among these was a questionnaire concerning the amount of time the subject spent in each of 20 different leisure activities during the previous three months. These activities were as follows:

1. Attending movies
2. Bull sessions (talk about present job)
3. Bull sessions (talk about past and future duty assignments)
4. Bull sessions (talk about politics, religion, etc.)
5. Reading fiction
6. Reading biographies

- | | |
|--|--|
| 7. Reading religious literature | 14. "Happy Hour" |
| 8. Reading technical magazines | 15. Playing cards |
| 9. Studying for courses | 16. Playing chess and checkers |
| 10. On the ham radio | 17. Shooting pool or billiards |
| 11. Writing letters | 18. Listening to classical music |
| 12. Physical exercise (such as weight lifting, isometrics, etc.) | 19. Listening to popular music |
| 13. Painting and drawing | 20. Listening to western-country music |

A 5-point scale, anchored at the ends by "Not at all" and "Every day" was used for each of the leisure activity items with response values ranging from 1 through 5.

Previous research (Doll and Gunderson, 1969) has demonstrated leisure activity differences between Navy enlisted men and civilians assigned to Antarctic scientific stations. In light of these differences it was necessary to make several comparisons to more fully evaluate the influence of station size upon leisure activity behavior. The comparisons were as follows:

- (1) Large station (military) versus small station (military).
- (2) Large station (civilian) versus small station (civilian).
- (3) Large station (total) versus small station (total).

Means and standard deviations were computed for the various group comparisons, and t-tests for differences between means were obtained.

RESULTS AND DISCUSSION

The means and standard deviations of the leisure activities for the various comparisons are presented in Appendices A through C. These appendices reflect the basic data from which the following tables were developed.

Table 1 presents those leisure activities for which the means were

significantly different in the large station (military) - small station (military) comparison. The results suggest that Navy enlisted men assigned to the larger stations spend more time early in the winter writing letters, playing chess and checkers, and shooting pool or billiards. However, those Navy men assigned to the smaller stations spend more time watching movies during this same period of time. In late winter the Navy enlisted men at the larger stations are significantly more involved in those leisure activities of "Happy Hour," card playing, listening to classical music and listening to western-country music. They also continue to spend more time playing pool or billiards. The Navy men assigned to the smaller stations during late winter participate in no leisure activity significantly more than their larger station cohorts. Even in the case of watching movies this is true. However, examination of Appendix A shows that this was a result of increased participation in this activity at the larger stations rather than a decrease at the smaller stations.

Table 2 shows the results of the comparison between the civilians assigned to the large stations and those assigned to the small stations. As was true in the first comparison civilians at the smaller stations spend significantly more time watching movies in the early part of the winter. Also, there was a tendency for civilians at the smaller stations to spend more time listening to western-country music during this period. Civilians at the larger stations spent significantly more time on the ham radio, playing chess and checkers and shooting pool or billiards during the early winter. However, in late winter the civilians at the large stations were participating at a significantly higher level only in the case of chess and checkers.

Table 3 gives the results of comparing the large stations with the

Table 1

Significantly Different Leisure Activity Behaviors -
Large Station (Military) versus Small Station (Military)

<u>Early Winter Activity</u>	<u>Station Size with Higher Mean</u>	<u>p^a</u>
1. Movies	Small	.05
2. Write letters	Large	.01
3. Chess and checkers	Large	.01
4. Pool or billiards	Large	.01
<u>Late Winter Activity</u>		
1. Happy Hour	Large	.01
2. Cards	Large	.01
3. Pool or billiards	Large	.01
4. Classical music	Large	.01
5. Western-country music	Large	.01

^aTwo-tailed probability.

Table 2

Significantly Different Leisure Activity Behaviors -
Large Station (Civilian) versus Small Station (Civilian)

<u>Early Winter Activity</u>	<u>Station Size with Higher Mean</u>	<u>p^a</u>
1. Movies	Small	.01
2. Ham radio	Large	.01
3. Chess and checkers	Large	.01
4. Pool or billiards	Large	.01
5. Western-country music	Small	.05
<u>Late Winter Activity</u>		
1. Chess and checkers	Large	.05

^aTwo-tailed probability.

Table 3

Significantly Different Leisure Activity Behaviors -
Large Station (Total) versus Small Station (Total)

<u>Early Winter Activity</u>	<u>Station Size with Higher Mean</u>	<u>p^a</u>
1. Movies	Small	.01
2. Ham radio	Large	.05
3. Write letters	Large	.01
4. Chess and checkers	Large	.01
5. Pool or billiards	Large	.01
<u>Late Winter Activity</u>		
1. Happy Hour	Large	.01
2. Cards	Large	.01
3. Pool or billiards	Large	.01

^aTwo-tailed probability.

small stations when the military and civilian contingents are combined. As expected consistencies across Tables 1 and 2 are reflected in Table 3. Thus, during early winter more time is spent watching movies at the smaller stations while pool or billiards and chess and checkers are more actively participated in at the larger stations. Also during this period more time is spent on the ham radio, and writing letters at the larger stations when the members are combined. It is apparent that the activity level is greater for "Happy Hour," playing cards, shooting pool and billiards at the larger stations during late winter.

Probably the most striking finding of the study was the relatively low leisure activity level at the smaller stations. The one clear exception to this was the watching of movies, especially in early winter. It is interesting

that it was this particular leisure activity which proved to be the exception since no other leisure activity would provide a more effective means of escapism. This finding would be congruent with the expressed lower feelings of compatibility among the same groups found earlier.

Certain of the differences found were probably due to lack of facilities at the smaller stations. This was certainly true in the case of pool or billiards. Other differences such as the playing of chess and checkers, playing cards, and enjoying "Happy Hour" may have been influenced by the number of possible interactions available. In other words, the number and variety of interactions would be enhanced by an increase in the number of people available, other things being equal.

Some of the findings do not lend themselves to easy explanations. It is difficult to explain why there should be significantly more letter writing (early), more listening to classical and western-country music (late) at the larger stations for the military. At present, it is difficult to say whether the leisure activity behaviors are the antecedents or the consequents of the compatibility factor. A third, but less likely possibility, is that they are simply concomitants of more basic parameters of the large station versus small station comparison. However, the first step leading to definitive answers of the above questions should be to identify as many of the distinguishing characteristics as possible.

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Footnote

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Opinions expressed are those of the authors and are not to be construed as necessarily reflecting the official view or endorsement of the Department of the Navy.

Appendix A

t-Tests of Mean Differences - Large Station (Military) versus Small Station (Military)

Leisure Activity	Large Station			Small Station			Early Winter			Late Winter		
	Mean	S.D.		Mean	S.D.		Mean	S.D.		Mean	S.D.	
			t			t			t			t
Movies	4.19	.97	-2.18*	4.59	.91		4.31	.96		4.60	1.00	-1.31
B.S. present job	3.79	1.10	1.29	3.50	1.14		3.84	1.14		3.76	.97	.55
B.S. old job	3.44	1.16	-.60	3.59	1.27		3.80	1.05		3.72	.98	.36
B.S. general	2.62	1.21	.04	2.63	1.29		2.61	1.22		2.28	.84	1.64
Reading fiction	2.62	1.47	-.68	2.81	1.40		3.13	1.29		2.84	1.21	1.07
Reading biographies	1.80	.99	1.62	1.52	.80		1.84	1.01		1.60	1.00	1.08
Reading religious literature	2.03	1.26	1.59	1.69	1.03		1.48	.82		1.56	1.00	-.87
Reading technical material	2.99	1.30	1.62	2.63	1.07		2.84	1.17		2.56	1.04	1.19
Studying courses	3.00	1.35	1.21	2.69	1.28		2.84	1.24		2.52	1.30	1.12
Ham radio	2.91	1.22	.27	2.84	1.30		2.56	1.21		2.76	1.42	-.65
Writing letters	2.82	1.42	2.89**	2.03	1.36		1.73	1.08		1.72	1.17	.04
Physical exercise	2.05	1.33	-1.03	2.34	1.43		2.34	1.46		2.48	1.53	-.42
Painting and drawing	1.97	1.32	.81	1.78	1.13		1.58	.94		1.64	.91	-.30
Happy Hour	2.71	1.40	1.29	2.36	1.33		2.78	1.44		1.92	1.00	3.59**
Cards	2.06	1.18	1.21	1.78	1.16		2.50	1.32		1.92	.91	2.66*
Chess and/or checkers	1.86	1.21	4.26**	1.22	.61		1.58	.94		1.52	.82	.32
Pool or billiards	3.15	1.39	5.11**	1.77	1.33		2.82	1.35		1.76	1.30	3.65**
Classical music	3.10	1.55	-.10	3.13	1.45		2.49	1.47		1.36	1.32	3.78**
Popular music	3.86	1.21	.18	3.81	1.38		3.90	1.19		3.80	1.19	.38
Western-country music	3.81	1.35	1.73	3.24	1.48		3.69	1.39		2.72	1.24	3.46**
	N	139		32			134			25		
N (Western-country Music)		102		25			96			21		

*p < .05
**p < .01

Appendix B

t-Tests of Mean Differences - Large Station (Civilian) versus Small Station (Civilian)

Leisure Activity	Early Winter				Late Winter				t
	Large Station		Small Station		Large Station		Small Station		
	Mean	S.D.	Mean	S.D.	Mean	S.D.	Mean	S.D.	
Movies	3.69	1.14	4.35	.94	3.96	.88	4.33	1.05	-1.23
B.S. present job	3.34	1.07	3.36	.95	3.35	1.14	3.07	1.39	.71
B.S. old job	3.03	1.05	2.91	1.11	3.10	1.14	3.07	.92	.10
B.S. general	2.86	1.14	2.74	1.14	2.82	1.11	3.00	1.36	-.46
Reading fiction	2.89	1.30	2.91	1.35	3.16	1.27	3.57	1.09	-1.21
Reading biographies	1.65	.94	1.91	.90	1.94	1.13	2.13	1.41	-1.21
Reading religious literature	1.95	1.33	2.04	1.30	1.38	.81	1.71	1.07	-1.06
Reading technical material	3.06	1.38	3.26	1.29	3.20	1.24	3.57	1.02	-1.15
Studying courses	2.70	1.44	2.87	1.52	2.77	1.45	2.93	1.62	-.34
Ham radio	2.73	1.13	1.83	.89	2.48	1.17	2.53	1.41	-.12
Writing letters	2.55	1.14	2.48	1.24	1.39	.62	1.87	1.13	-1.54
Physical exercise	2.10	1.40	2.52	1.68	2.59	1.53	2.87	1.85	-.53
Painting and drawing	1.79	1.15	1.83	1.07	1.36	.79	1.93	1.22	-1.68
Happy Hour	2.25	1.33	2.10	1.02	2.31	1.03	2.27	1.22	.11
Cards	1.83	1.07	1.59	.96	1.78	1.26	1.73	1.03	.16
Chess and/or checkers	1.95	1.22	1.18	.40	2.16	1.43	1.53	.83	2.24*
Pool or billiards	2.74	1.48	1.77	1.31	2.04	1.14	1.67	1.11	1.04
Classical music	3.78	1.32	3.57	1.12	3.52	1.39	3.67	1.29	-.39
Popular music	3.54	1.36	3.61	1.50	3.81	1.19	3.73	1.39	.20
Western-country music	2.33	1.41	3.26	1.56	2.23	1.34	3.07	1.49	-1.95
	N	80	23		70	15			
	N (Western-country Music)	69	19		69	14			

*p < .05

**p < .01

Appendix C

t-Tests of Mean Differences - Large Station (Total) versus Small Station (Total)

Leisure Activity	Large Station			Small Station			Early Winter			Late Winter		
	Mean	S.D.		Mean	S.D.		Mean	S.D.		Mean	S.D.	
			t			t			t			t
Movies	4.01	1.06		4.49	.92	-3.07**	4.19	.95		4.50	1.01	-1.77
B.S. present job	3.63	1.11		3.44	1.06	1.16	3.68	1.16		3.50	1.18	.87
B.S. old job	3.29	1.14		3.32	1.24	-.16	3.56	1.13		3.49	1.00	.39
B.S. general	2.71	1.19		2.67	1.22	.21	2.68	1.18		2.55	1.11	.66
Reading fiction	2.72	1.41		2.86	1.37	-.67	3.14	1.28		3.10	1.21	.19
Reading biographies	1.75	.97		1.69	.86	.45	1.87	1.06		1.80	1.18	.34
Reading religious literature	2.00	1.28		1.84	1.15	.89	1.44	.81		1.62	1.01	-1.04
Reading technical material	3.02	1.33		2.89	1.20	.70	2.96	1.21		2.92	1.13	.20
Studying courses	2.89	1.39		2.76	1.37	.62	2.81	1.31		2.68	1.42	.53
Ham radio	2.85	1.19		2.42	1.24	2.30*	2.53	1.20		2.68	1.40	-.63
Writing letters	2.75	1.32		2.22	1.32	2.64**	1.61	.96		1.78	1.14	-.87
Physical exercise	2.07	1.35		2.42	1.52	-1.55	2.43	1.49		2.63	1.64	-.71
Painting and drawing	1.91	1.26		1.80	1.10	.64	1.51	.90		1.74	1.03	-1.36
Happy Hour	2.54	1.39		2.26	1.21	1.43	2.62	1.33		2.05	1.08	2.89**
Cards	1.97	1.15		1.70	1.08	1.61	2.26	1.34		1.85	.95	2.29*
Chess and/or checkers	1.89	1.21		1.26	.53	6.29**	1.77	1.16		1.53	.82	1.55
Pool or billiards	3.00	1.43		1.77	1.31	5.97**	2.55	1.34		1.73	1.22	3.78**
Classical music	3.35	1.51		3.31	1.33	.19	2.83	1.52		2.85	1.44	.08
Popular music	3.74	1.28		3.73	1.42	.05	3.87	1.19		3.78	1.25	.42
Western-country music	3.28	1.54		3.25	1.50	.12	3.19	1.53		2.85	1.33	1.42
	N	219		55			204			40		
N (Western-country Music)	171			44			165			35		

*p < .05

**p < .01