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EMOTIONAL HEALTH IN EXTREME AND NORMAL ENVIRONMENTS

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EMOTIONAL HEALTH IN EXTREME AND NORMAL ENVIRONMENTS

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The incidence and etiology of emotional ill health is of obvious importance and concern to physicians and psychologists in industrial and military settings. The enormous burden that mental illness and lesser forms of emotional ill health impose upon society and the individual are too well-known to bear repeating here. The traditional emphasis upon early childhood experiences as primary determinants of adult personality and behavior has given way in recent years to the broader view that social and environmental factors play an important part in the stimulation and expression of emotional symptomatology.

The studies summarized in this paper were designed to test the proposition that emotional ill health is importantly related to cultural background, personal needs, occupational roles, and persistent environmental stresses. It is plausible that relationships between personal needs or occupational roles and increases in symptoms may appear only under extreme environmental conditions or prolonged stress. Antarctic scientific stations have been utilized as natural laboratories for the study of human adaptation to extreme environments.

Emotional symptoms can be measured in various ways, including self-report questionnaires. The principal self-report instruments used in our studies have been the Cornell Medical Index-Health Questionnaire (CMI) and its derivatives. The CMI, which has been extensively used in the United States and elsewhere in clinical and epidemiological studies, consists of 195 simply worded questions to be answered yes or no. Each yes response reflects the presence of a symptom or disorder as seen by the subject. A closely related symptom questionnaire, The List of Common Symptoms, was employed in Antarctic studies. This questionnaire consists of 49 items which are virtually identical in content to CMI items but answers are given on a 4-point scale ranging from no complaint to severe complaint. A third test instrument, the Health Opinion Survey, is an abbreviated form of the Cornell Medical Index consisting of 20 items with response given on a 3-point scale.

The List of Common Symptoms questionnaires were administered to several Antarctic groups on three occasions during each of the two years of the International Geophysical Year. The first testing took place before the Antarctic winter, the second testing occurred at midwinter, after three to four months of isolation, and the final testing took place at the end of the winter period. The most prevalent symptoms at midwinter in both expeditions were sleeping disturbances (difficulty falling asleep or staying asleep, waking up at night, and feeling tired during the day) and depression (feeling blue and feeling lonely). Headaches and feeling easily annoyed or irritated also were reported frequently both years. Changes in specific symptoms from prewinter to midwinter were evaluated by means of the sign test in which positive and negative changes on the 4-point response scale were tabulated. In the first expedition the following symptoms showed significant shifts toward increasing severity from prewinter test administrations: difficulty in falling asleep or staying asleep, waking up at night, bad dreams, feeling blue, feeling lonely, easily annoyed or irritated, feeling critical of others, headaches, feeling tired during the day, and pains in the lower back. In the second expedition the most marked changes occurred in the same symptoms that differed significantly from prewinter to midwinter in the first

expedition, that is, items pertaining to sleep disturbances, depression, and irritability.

It was clear that emotional disturbances and symptomatic complaints tended to increase in healthy individuals exposed to the prolonged restricted stimulation of the Antarctic situation. These symptoms appeared psychologically unpleasant and presumably would have a deleterious effect upon work effectiveness and social adjustment. This assumption was supported by significant correlations between symptoms scales -- constructed from highly intercorrelated questionnaire items and labeled Anxiety, Depression, Aggression, and Insomnia -- and measures of individual motivation, feelings of usefulness, and group compatibility obtained near the end of winter.

Additional studies of symptom incidence were conducted during the most recent Antarctic expeditions. Antarctic living and working conditions generally have improved since the IGY period, and so it was anticipated that symptom incidence might diminish. This expectation was not realized because the incidence of symptoms was consistently higher for members of recent expeditions.

Navy enlisted occupational groups reported more symptomatology during all expeditions than did civilian meteorologists and scientists, reflecting the relationship between occupational roles and emotional symptoms. Men in Navy construction occupations (carpenters, plumbers, electricians, and mechanics) reported more insomnia at midwinter -- the period of least activity for this group -- than did other groups.

In all four expeditions studied, older members had fewer symptoms. During the early expeditions, those with more education tended to report fewer symptoms. Level of father's education also was negatively correlated with symptom scores. Truancy from school or running away from home during school years related to midwinter and late winter symptoms.

Relationships of birth order to the symptoms scales were of special interest in that the results seem to support Schachter's prediction that first-born children respond differently to stress than do other individuals. Schachter specifically hypothesized that first-borns will seek affiliation or closeness to others under anxiety arousing conditions (Schachter, 1959). The data shown in Table 1, based upon responses of military personnel in two expeditions, certainly appear consistent with the notion that first-borns become more anxious under mild but prolonged stress than do others.

Table 1

Correlations between the "Oldest Child" Category and Symptom Scores

	<u>Early Winter</u>	<u>Late Winter</u>	<u>Change</u>
Anxiety	-15 ^a	11	24*
Depression	-16	17	28*
Aggression	-11	25*	30*
Insomnia	-02	37*	34*

*Correlations significant beyond .05 level.

^aProduct-moment correlations; decimals are omitted. N equals 78.

Men in the "Oldest Child" category tended to have low symptom scores at early winter as shown by the negative signs in Table 1. At the end of winter, however, men in the "Oldest Child" category generally had higher symptom scores than did other individuals, particularly on the Insomnia Scale. Changes (increases) in scores on all four of the symptoms scales significantly correlated with being an oldest child.

Personality traits of military personnel most susceptible to the development of symptoms through the Antarctic winter are illustrated by the following test items which were among the most highly correlated with a Total Symptoms score derived by summing all scale scores for both administrations: "Life usually hands me a pretty raw deal," "A person is better off if he doesn't trust anyone," and "I have had more than my share of things to worry about." Subjects with high symptom scores tended to agree with the foregoing statements and to disagree with the statement, "Most of the time I feel happy."

The individual prone to develop symptoms in the Antarctic prefers the following personality traits in close friends: sympathetic, sentimental, confiding, praising, and warm. The person who develops symptoms also prefers his friends to be dignified. Individuals who describe themselves as hard, stubborn, blunt, and rough in manner tend not to develop symptoms.

Thus, a pattern of social and personality characteristics emerges which when given proper weights by means of linear multiple regression methods provides a substantial degree of prediction of individual differences in susceptibility to emotional distress in one extreme environment.

During one expedition Anxiety, Depression, and Aggression scores derived from the List of Common Symptoms questionnaire were found to correlate substantially ($p < .001$) with an independent measure of Emotional Changes derived from symptom check-list records accumulated by station leaders (including a medical officer). The Insomnia Scale was significantly correlated ($p < .001$) with a Medical Complaints Index derived from the same symptom check list maintained by the station medical officer. In this paper space does not permit detailed discussion of forms of symptom measurement other than self-report questionnaires utilized in the Antarctic studies, namely, medical and behavioral records by station leaders and ratings of emotional stability by supervisors and peers. These measures are described elsewhere (Gunderson, 1966).

Are these relationships between social and demographic factors and emotional symptoms tenable for men not involved in arduous and stressful situations? Comparative data are available for young men of similar age and for selected psychiatric patients. These data are from responses on the Cornell Medical Index and its abbreviated derivative, the Health Opinion Survey. The CMI can sharply distinguish patients from non-patients. For patients, level of education is negatively related to CMI scores, but age, except for 17-year olds, is unrelated. For non-patients, education was negatively correlated with amount of symptomatology as reflected in CMI scores. Men with some college education had much lower scores than other groups. Age tended to have a curvilinear relationship with CMI scores in that men in the 22-23 age group scored somewhat higher than younger and older groups. Similarly, third class petty officers tended to have higher CMI scores than men of higher and lower rank. Single men scored much lower than married, separated, or divorced individuals.

A further opportunity to examine correlates of emotional ill

health was afforded by study of approximately 800 psychiatric out-patients tested with the Health Opinion Survey (HOS) at five Navy out-patient clinics. The HOS provides a score based upon 20 symptoms questions answered on 3-point scales: never, sometimes, and often. The population tested consisted of a heterogeneous sample, providing large variations in demographic and social characteristics and in the amount of symptomatology present. In this population age, rank, intelligence, and education were negatively correlated ($p < .001$) with emotional symptomatology as indicated by HOS scores but birth order was unrelated.

Demographic and social background factors, notably age and education, tend to have constant relationships to the amount of symptomatology expressed, regardless of variations in environmental conditions. Under the conditions of prolonged group isolation and confinement experienced at Antarctic scientific stations, a number of relationships appeared between social background or personality characteristics and emotional symptoms which were not present under less extreme conditions. We have attempted to demonstrate that susceptibility to emotional disturbances is importantly related to and predictable from a variety of personal and social characteristics, including occupational role, particularly in an extreme environment.

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- Gunderson, E. K. E. (1966), Adaptation to Extreme Environments: Prediction of Performance. Report Number 66-17, U.S. Navy Medical Neuropsychiatric Research Unit, San Diego, California 92152.
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13. ABSTRACT Certain demographic and social background factors, notably age and education, tend to have constant relationships to the amount of symptomatology expressed, regardless of variations in environmental conditions. Under the conditions of prolonged group isolation and confinement experienced at Antarctic scientific stations, a number of relationships appeared between social background or personality characteristics and emotional svmpptoms which were not present under less extreme conditons. We have attempted to demonstrate that susceptibility to emotional disturbances is importantly related to and predictable from specific personal and social characteristics, including occupational role, and that certain relation-ships only appear after prolonged mild stress.		

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