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Interpersonal Relations among Indian Antarctic Expedition Members in Isolated and Confined Environment

K. Ramachandran, F. U. John Paul and Manas K. Mandal

Defence Institute of Psychological Research, DRDO, Delhi

ABSTRACT

With the advancement of technology, interpersonal factors take on increasing importance in relation to long duration missions in isolated and confined environments. This study explores the interpersonal orientation at the feeling and the behaviour level during prolonged residence in Antarctica. Twenty-four volunteers from winter-over team of Indian Antarctic Expedition served as participants. FIRO-F and FIRO-B questionnaires were the tools used in this study. The interpersonal orientation at feeling level showed that feeling of lovability was greater than feelings of significance and control. Besides, the feeling of warmth and the respect for competence were low when compared to the feeling of significance desired from others. At the behavior level, the need for association was greater than the need for personal intimacy with others. On the other hand, the desire for affection from others was higher than the preference for social interaction. In addition, the overall interpersonal behavior revealed a significant improvement in the second half of prolonged isolation in extreme environment.

INTRODUCTION

The growing technologies have expanded human capabilities and accelerated human endeavor in the exploration of space and analog environments. Consequently, the number of people working in isolated and unusual environment has increased than ever (Suedfeld, 1998). Though technological sophistications increase the comfort and reduce the physical danger, they do little to enhance the social life in a hostile, isolated, and unusual environment such as Antarctica. Hence, with the advancement of technology, interpersonal factors take on increasing importance in relation to long duration missions in isolated and confined environments.

In reviewing the literature pertaining to various extreme environments, Bishop (2004) reported that small issues can take on a typical importance

when individual is in confinement and isolation. Feelings and emotions are the prime factors that drive isolated personnel to perceive even usual difficulties in a magnified way. Depending on the location and time of year, expeditions are usually physically isolated from the outside world, with darkness and weather conditions exerting severe restrictions on travel. People on such expeditions are separated from their family and friends and consequently feel various levels of emotional deprivation. Personal crisis such as the death of a family member, financial difficulties, or deterioration in marital relations become magnified by the separation (Palinkas and Suedfeld, 2008).

At the same time, people experience social confinement within the expedition itself. During fieldwork conducted at McMurdo and South Pole stations in 1988 and 1989, informants complained that the lack of privacy and constant gossip that pervaded the community had a negative influence on social relations, especially relations between men and women. Consequently, as much as 60% of one's leisure time is spent alone in a dormitory room and 47.6% of residents reported feeling more irritable than usual (Carrere et al., 1991). In addition, there is little separation between work and leisure because living and working spaces are in close proximity to one another. This constant interaction is a potential reason for increased interpersonal conflict among expedition members. In fact, winter-over crew members report that the isolation and confinement are more difficult to live than the extreme environmental conditions and this is attributed to the separation from usual sources of support and the relative difficulty in obtaining emotional support from other station members (Palinkas, 2003).

Several anecdotal reports as well as studies of small groups in polar stations, and isolated and confined environments suggest that prolonged duration leads to negative affect, social withdrawal, and increased interpersonal and social conflict (Natani and Shurley, 1974; Palinkas, 1992; Stuster, Bachelard, and Suedfeld, 2000). In most cases, this interpersonal issue (e.g. interpersonal tensions, problems resulting from crew heterogeneity, anger displaced to outside personnel, need for dominance, and decreased cohesiveness over time) seems to shoot up the negative feeling among personnel residing for extended duration in isolated and extreme environment. The conflicts or social tensions in isolated groups seem to result from untoward feelings in interpersonal relations. This is evident from the reports of Sandal (2001) which state that with the end of the cohabitation people allow themselves to express opinions and feelings that

can be sources of tension. Palinkas (2001b) noted that interpersonal tension is reflected in open antagonism directed towards fellow crew members, or more commonly through social withdrawal and isolation, and ultimately, decreased cohesiveness. Also, it has been found that crew members who did not perceive themselves as close and did not make attempts to understand and share common group values ran into risk of becoming the 'stranger' or the 'alien' in the group (Gushin et al., 1998; Helmreich et al., 1980; Leon and Koscheyev, 1997; Penwell, 1990).

Interpersonal issues, as indicated in the foregoing paragraphs, have a negative influence on feelings of personnel who reside for prolonged duration in extreme environment. Antagonism, arguments, and fights have occurred in isolated groups but have not progressed to the point of interfering with mission goals (Kanas, 1987). Depression is one of the common symptoms seen during polar expeditions, closely followed by anxiety and irritability (Palinkas and Suedfeld, 2008). Negative affect is usually noted during winter in Antarctica (Palinkas and Browner, 1995a) and is generally attributed to psychosocial stress (Palmai, 1963). Smith (1969) stated that the foremost psychological irritants were inadequate leadership and the behaviour of others. The former, of course, may be a subset of the latter. Disruptive effects on interpersonal relationship of the group have been noted in Antarctica (Smith, 1969), in submarines (Sandal and colleagues, 1999), and also in the Soviet space program (Bluth and Helppie, 1986). As a result of interpersonal tensions, there have been physical assaults, as well as complaints about other people's trivial habits, among both early and recent polar residents. For example, Palinkas (1990) recorded a murderous attack over a chess game in polar station. Interpersonal conflict found to arise due to the mix of individual characteristics in the group (Altman and Haythorn, 1967; Kubis, 1972).

Several studies have noted interpersonal tension or conflict in isolated groups such as those in Polar Regions, space capsules and other analogous environments (Gunderson, 1974; Palinkas, 1992; Linenger, 2000; Palinkas, 2001b). Further, it was highlighted that "interpersonal conflict and tension is the greatest source of stress in polar expeditions" (Palinkas and Suedfeld, 2008, p. 4). Interpersonal problems affect group cohesiveness (Sandal, Vaernes, and Ursin, 1995) and also result in psychological problems and reduced well-being (Kanas, 1990). Bhargava, Mukerji, and Sachdeva (2000) and Sharma, Baskaran, and Malhotra (1976) reported significant reductions in interpersonal communication with fellow crew members. A low need

for social interaction was observed in small groups in isolated and confined conditions (Leon, McNally, and Ben-Porath, 1989; Moes, Lall, and Johnson, 1996). The desire for affection from others was found inversely associated with task ability, emotional stability, social compatibility, and overall performance (Palinkas, Gunderson, Johnson, and Holland 2000b).

There have been reports that personnel in polar region, space or in analogous environments may experience greater psychological and interpersonal difficulties after the halfway point of mission (Bechtel and Berning, 1991; Sandal, Vaernes and Ursin, 1995). According to this view, a sense of relief that half of the mission is over, outweighed by the realization that another half is yet to come. Sandal (1999) found that interpersonal relationships during isolation deteriorated around the middle and towards the end of the isolation. Nevertheless, a few studies failed to find such time effects on interpersonal relations in isolated and confined groups (for instance, Peri, Scarlata and Barbarito, 2000; Kahn and Leon, 1994; Palinkas, Suedfeld and Steel, 1995b).

Interpersonal tension and conflict within isolated and confined groups in extreme environment are attributed to social comparisons that are inevitable, ostracism of crew members who do not adhere to group norms, group heterogeneity characterized by differences in gender or occupation, poor or ineffective leadership, and competition between leaders, or leaders and followers (Palinkas and Suedfeld, 2008). The interpersonal tension might also be a response to interference with established routines, delays in arrival of relief parties or suppliers, or problems with communication. However, not all isolated crews have experienced such interpersonal conflicts. Studies of Antarctic winter-over crew have found that interpersonal conflict and group cohesion varies from one year to the next (Palinkas, 1992).

To summarize, a great share of existing studies accentuated the interpersonal or social tension and its consequences in small isolated and confined groups (Palinkas, 1992; Sandal, 2001; Palinkas and Suedfeld, 2008). However, very little has been learnt about the relationship orientation of isolated and confined groups living in Antarctica and analogous environment. There has been little empirical exploration to know about how occupants of isolated and extreme environments feel on interpersonal domains. Furthermore, with few exceptions, there has been an absence of study relating to types of interpersonal need pertain to behaviour in isolated and confined environment. Investigation on how much interaction a person

expresses and wants in the areas of socializing, leadership, and intimate personal relations in such restricted environment may serve as an index for understanding the dynamics of human interpersonal relations in isolated and extreme environment. Hence, the following objectives were set as objectives:

1. To evaluate the interpersonal orientation related to feelings of significance, competence, and lovability over extended residence in isolated and extreme environment.
2. To assess the interpersonal dimensions of behaviour - inclusion, control, and affection at the first and the second half of prolonged isolation and confinement in extreme environment.

METHOD

Participants: The wintering team at Maitri – the Indian Research Base in Antarctica (70°45'S, 11°44'E) was made up of 24 men and 1 woman (aged 24-55 years), including the second author, who collected the data. Twenty three men, excluding the author, served as participants after the study objectives and data collection procedures had been thoroughly explained to them. Participants were comprised of scientific and logistic personnel who resided for 14 months in Antarctica. The mean age of participants was 39 years (SD = 8.7 years). Each subject was medically and psychologically qualified before the onset of Antarctic expedition. The screening and selection for expedition were done by National Centre for Antarctic and Ocean Research, India.

MATERIALS

1. FIRO-F: The feeling component of interpersonal orientation was assessed using Fundamental Interpersonal Relations Orientation-Feelings (FIRO-F) which is identical with FIRO-B. It differs in that it measures inclusion, control, and affection at the level of feelings rather than of behavior. The FIRO-F consists of six Guttman scales, namely, expressed inclusion (EI), wanted inclusion (WI), expressed control (EC), wanted control (WC), expressed affection (EA), and wanted affection (WA). The dimensions of inclusion, control and affection become significance, competence, and lovability respectively at the level of feeling (Schutz, 1978) (see Table 1). The FIRO-F reports people's beliefs about their characteristic feelings in their relationships with other people. FIRO-F has been found applicable to interpreting

the dynamics of interpersonal feelings and it is independent of intelligence, attitude toward childhood relationships and preferred defense mechanism (Schutz, 1978).

Table 1—Facet Design for FIRO-F

	Expressed Feeling	Wanted Feeling
Inclusion (Significance)	Other people are important to me. I think people are significant and I am interested in them.	I want others to have a high regard for me as a person. I want them to consider me important and interesting.
Control (Competence)	I see other people as competent and capable I trust and rely on their abilities.	I want other people to feel that I'm a competent person and respect my capabilities.
Affection (Lovability)	I feel people are likeable and lovable. When you know them well they are basically good and warm.	I want people to feel that I am a likeable and loveable person who is very warm and affectionate.

2. FIRO-B: The FIRO-B (Fundamental Interpersonal Relations Orientations – Behaviour) measures the behaviour that the respondents express toward other people and the behaviour that they want other people to express toward them in the areas of inclusion (need for social orientation), control (need for leadership behaviour), and affection (need for intimate relationship). It comprises six ordinal level Guttman scales of 9 items each with scores ranging from 0 to 9. The six scales are expressed inclusion (EI), wanted inclusion (WI), expressed control (EC), wanted control (WC), expressed affection (EA), and wanted affection (WA). These scales do not measure quantity of a specific behaviour but rather the kinds of behaviour which the respondent sees as more or less characteristic of the way he or she behaves. The respondent was instructed to answer questions in terms of how he or she actually behaves rather than what he/she thinks a person should do. For additional information on the FIRO-B scales refer to Schutz (1978).

PROCEDURE

Following within-subject design, the FIRO-F questionnaire that assesses interpersonal orientation related to feeling was administered to volunteers at three different phases, that is, at beginning phase (one month after deployment to Antarctica), at middle phase (after seven months), and at final phase (one month prior to redeployment to India). The beginning and the final phases marked the summer season characterized by prolonged light and outdoor activities. All personnel spent maximum time on work and station activities in summer season. The middle phase marked the winter season that is characterized by prolonged darkness and reduced mobility. Sports, music, and various activities were organized as well as video shows on Indian mythological stories like Ramayana and Mahabharata were put to engage the time during the peak winter season. Birthdays, Anniversaries and festivals were also celebrated by winter-over personnel.

For administration of FIRO-B, the entire period of expedition was split into two halves. In the first half of the expedition (i.e., the first 7 months), the FIRO-B was administered 2 months after deployment to Antarctica. The participants were asked to complete the same test 2 months prior to redeployment to India in the second half of the expedition (i.e., the second 7 months). We believed that in the first 2 months of isolation and confinement, individuals will have initial euphoria to the new environment and people would be in the process of establishing relationship with people in the group. Hence, in the first half, test was conducted after 2 months of reaching Antarctica. In the same fashion, it was believed that the last 2 months will be significant for people isolated for long duration, as they may experience euphoria and excitement on completing the mission and joining back their family. Because such feelings may resist the real effect on interpersonal behaviour, participants were asked to complete the test 2 months prior to leaving Antarctica. The tests were administered individually under the room temperature ranging from +18° to +22°C.

RESULTS

The three dimensions of interpersonal orientation at the feeling level are significance (i.e. feelings of importance directed from self to others and one's importance being experienced from others), competence (i.e. respondent's trust in others' abilities and his desire that others will perceive him as capable and competent) and lovability (i.e. feeling of affection directed towards others and respondent's belief that he/she is warm, likable

and lovable). The expressed and wanted affective experiences which define how much a person expresses to others, and how much he wants from others for each types of feeling was assessed in winter-over personnel during the long-term stay in isolated and extreme environment. Data of twenty-four participants was submitted to 3 (types of feeling: significance, competence, and lovability) x 2 (types of need: expressed and wanted) x 3 (phases: beginning, middle, and final) factorial ANOVA with contrast and post-hoc tests.

There was a significant main effect of feeling, $F(2, 46) = 27.88$, $p < 0.001$. The contrasts revealed a significant difference between feelings of significance and lovability, $F(1, 23) = 38.10$, $p < 0.001$, $\eta^2 = 0.62$ (large effect); feelings of competence and lovability, $F(1,23) = 29.97$, $p < 0.001$, $\eta^2 = 0.56$ (medium effect); and feelings of significance and competence, $F(1, 23) = 4.43$, $p < 0.05$, $\eta^2 = 0.16$ (small effect). Similarly, Bonferroni post-hoc test for the main effect of feelings indicated a significant mean difference between feelings of significance and lovability, and feelings of competence and lovability. Figure 1 displays the mean score for each types of feeling. It is clear from the graph that feeling of lovability is greater when compared to feelings of significance and competence. The main effect of need, i.e., the expressed need ($M = 3.95$, $SD = 0.22$) and the wanted need ($M = 3.10$, $SD = 0.36$) was not significant, $F(1, 23) = 4.25$, $p > 0.05$. The main effect of phase was also non-significant, $F(2, 46) = 0.58$, $p > 0.05$.

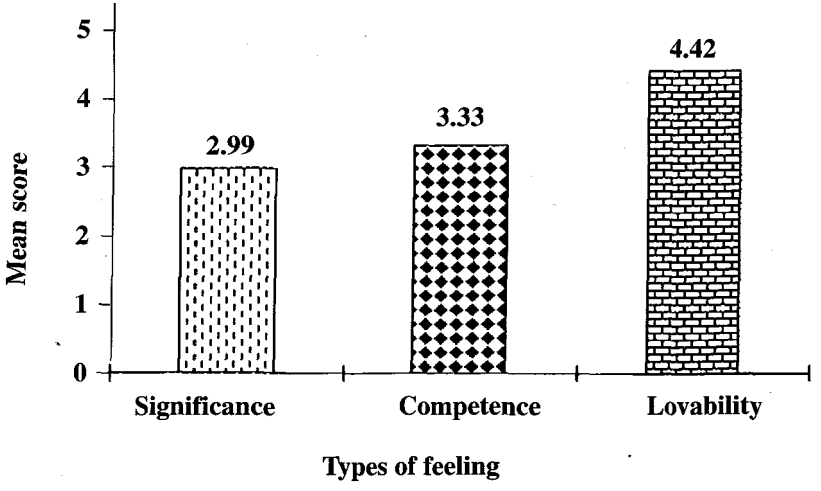

Fig. 1: Mean score for each types of feeling

There was a significant interaction effect between the types of feeling and the types of need, F (2, 46) = 9.75, $p < 0.001$. To break down this interaction, contrasts were performed comparing the types of feeling and need. These revealed significant interactions when comparing wanted need to expressed need both for feeling of lovability compared to feeling of significance, F (1,23) = 8.91, $p < 0.05$, $\eta^2 = 0.27$, and feeling of competence compared to feeling of significance, F(1,23) = 16.88, $p < 0.001$, $\eta^2 = 0.42$. Looking at the interaction graph (Figure 2), these effects reflect that wanted need (compared to expressed need) lowered scores significantly more in feeling of lovability and in feeling of competence than it did for feeling of significance. This indicates that the desire for love and respect for competence was significantly low when compared to desire for significance from others.

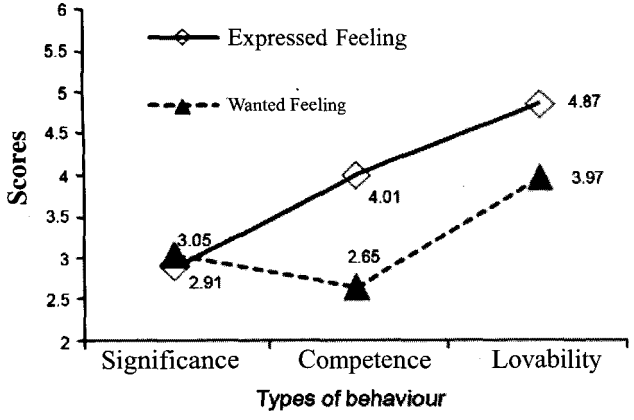

Fig. 2: Interaction graph of types of feeling and need

The remaining contrast revealed no significant interaction when comparing wanted need to expressed need for feeling of competence compared to feeling of lovability, F (1,23) = 1.91, $p > 0.05$. Similarly, the other interactive effects like Feeling × phase, F (4, 92) = 1.54, $p > 0.05$; Need × Phase, F (2, 46) = 1.33. $p > 0.05$; and Feeling × Need × Phase, F(4, 92) = 1.79, $p > 0.05$ were non-significant.

This study also assessed the behavioural aspects of the three dimensions of interpersonal relations, namely inclusion (socialization), control (leadership and responsibilities), and affection (intimate personal relations) among winter-over personnel over long-duration residence in isolated and confined extreme environment. The data collected at the first

and second half of the expedition was analyzed using a 3(types of behaviour: inclusion, control, and affection) × 2(types of need: expressed and wanted) × 2(time: first half vs. second half of the expedition) within-subjects factorial design. The main effect of behaviour, namely, the inclusion behaviour (M = 3.73, SD = 1.86), the control behaviour (M = 3.19, SD = 2.37), and the affection behaviour (M = 3.86, SD = 2.47) indicated non-significant difference, F (2,44) = 2.06, MSE = 11.75, $p > 0.05$. Likewise, the types of need, that is, the expressed need (M = 3.81, SD = 2.03) and the wanted need (M = 3.38, SD = 2.43) did not show significant difference, F (1, 22) = 3.33, MSE = 12.18, $p > 0.05$. However, the analysis of main effect of time showed significant improvement in the overall interpersonal behaviour (the mean score of six scales of FIRO-B) after halfway point of prolonged isolation and confinement, F (1,22) = 4.62, MSE = 17.75, $p < 0.05$. In the first half, the overall interpersonal behaviour was 3.34 (SD = 2.21), whereas the mean score was 3.85 (SD = 2.26) in the second half of prolonged isolation and confinement. The error bar for six scales of interpersonal behavior in the first versus the second half of prolonged isolation in extreme environment is set out in Figure 3.

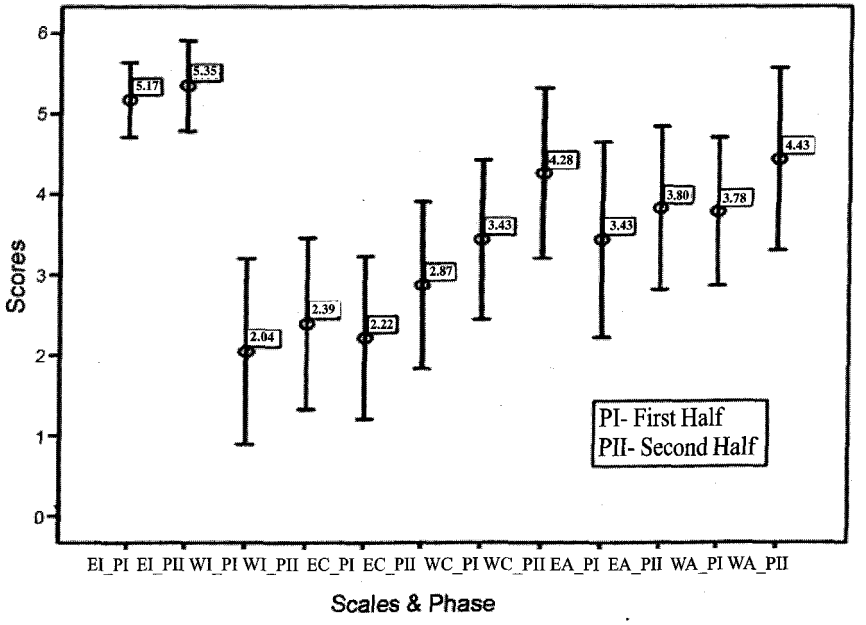

Fig. 3: Error bar for the six scales of interpersonal behavior in first versus second half of prolonged isolation and extreme environment

There was significant interaction effect between types of behaviour and need, F (2,44) = 21.73, MSE = 122.62, p <0.001, η^2= 0.58. To break down this interaction, simple contrast test was performed comparing the three interpersonal behaviour and the two types of need. These revealed significant interactions when comparing inclusion behaviour to affection behaviour for expressed need compared to wanted need, F (1.22) = 25.43, MSE = 434.78 p <0.001, η^2 = 0.74.

Looking at the interaction graph (Figure 4), these effects reflect that inclusion behaviour (compared to affection) lowered scores significantly more for wanted need than it did for expressed need. The remaining interactive effects, that is, types of behaviour × time, F (2, 44) =0.68, MSE = 1.31, p > 0.05; types of need × time, F (1, 22) = 0.27, MSE=0.71, P>0.05; and types of behaviour x types of need × time, F (2, 44) = 0.00, MSE = 0.01, p > 0.05 were not significant.

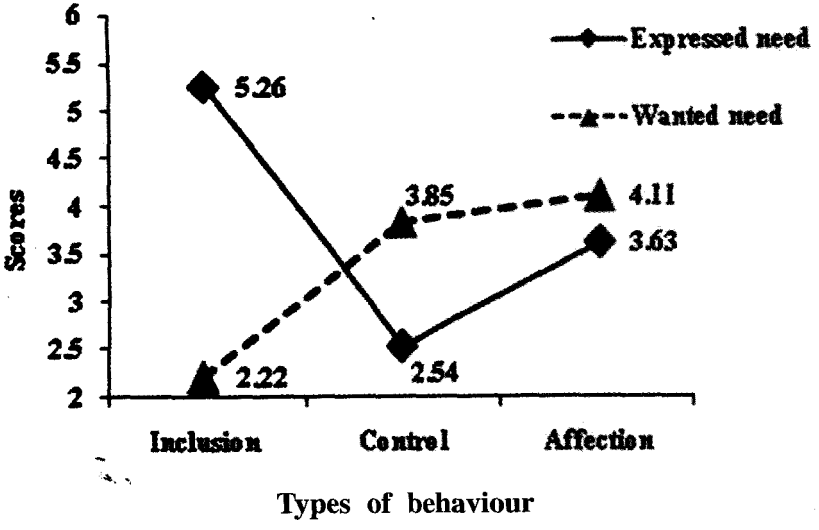

Fig. 4: Interaction graph of types of behaviour and need

DISCUSSION

The goal of this study was to assess the dimensions of interpersonal relations with respect to feeling and behavior. At the feeling level, it was observed that the feeling of lovability was higher than the feelings of competence and significance during prolonged residence in extreme environment. This highlights the greater need for personal warmth among

Indian Antarctic Expedition members in isolated and extreme environment. It is already known that groups in polar stations generally reflect a social categorization related to professional status, because of different values, goals, and activities (Stuster et al., 2000; Weiss and Gaud, 2004). Hence, the isolated personnel were dependent on the skills of other scientific or logistic fellow-member for executing tasks effectively and for making life blissful during the prolonged exposure to isolation, confinement, and stresses of extreme physical conditions (light-dark cycles, blizzards, temperatures). Thus, it may be argued that harsh physical environment and social isolation for extended duration called for increased feeling of love and decreased feelings of control and significance in prolonged isolation and extreme environment.

Another aspect of the situation bears on interpretation of this result, namely, the degree of interpersonal relations during long-duration residence. Prior to arriving in Antarctica, personnel had hardly interacted with each other and everyone was new to the other. But the continuous stay for long duration for about a year under one roof in social isolation and unusual conditions may have facilitated personnel to get to know well about other people, and thus, emerge out of subculture, regional, and occupational differences. In addition, celebrations of anniversary and various festival, and extracurricular activities during continuous residence would have given greater chance for personnel to share their warmth with each other. This may be the important factor for the high feeling of lovability as compared to feelings of competence and significance.

However, the interaction effect revealed that feeling of affection and respect for competence desired from others was low as compared to feeling of significance. This indicates that personnel were less intimate, emotionally distant, distrustful, and not responsible. In light of the interpretation of FIRO theory (Schutz, 1978), the high expressed feeling and the low wanted feeling on interpersonal areas of significance, competence, and lovability, reflects the following characteristics in interpersonal orientation related to feelings. Personnel isolated and confined for prolonged duration are outwardly more social, but their basic feelings are just like those of the less social persons. The underlying feeling is that no one is interested in them and they respond to that feeling by making people pay attention to them in any way that they can. Likewise, personnel abdicate power and responsibility. The underlying feeling is that they are incompetent and irresponsible, and that they do not deserve respect on the basis of their

abilities. Behind this feeling are anxiety, hostility, and lack of trust toward others who might withhold assistance. Consequently, they avoid situations in which they feel helpless. Similarly, individuals felt that others are good and affectionate and yet personal warmth from others was less desired. This again was due to misplaced anxiety about ever being loved and about being unlovable and hostility stemming from anticipation of rejection.

The findings point out some amount of restraint in feelings of lovability and competence which may be attributed to anxiety, hostility and rejection. Earlier studies have also described similar reaction in isolated and Antarctic groups. Sandal and colleagues (1995) have described the mood of the team as more distant, quarrelsome, and gloomy from middle to end of isolation. The low need for affection from others, which was observed in this study, endorses the reports of Palinkas et al. (2000a) that socially adept introverts with little need for affection from others are viewed as more socially compatible than socially inept extraverts with high needs for affection or interaction. Further, the low desire for affection was also found inversely associated with task ability, emotional stability, social compatibility, and overall performance (Palinkas, 2001b).

The time or duration of residence in isolated and extreme environment had little effect on interpersonal orientation related to feelings. This endorses the reports of Sandal et al. (1995) which indicated that personnel undergo crises in certain periods of isolation and confinement, which seem to be relatively independent of the actual duration of the mission.

This study points out the sizable difference in choice and preference of feelings of significance, competence, and lovability. The feeling of affection was dominant. However, the affection and the respect for abilities desired from others were lesser than the feeling of significance. Interpersonal orientation related to feelings was not affected by time or prolonged duration of isolation or extreme conditions. The study has presented the underlying characteristic feelings on interpersonal orientation. Contemporary literature on interpersonal feeling being sparse, further investigation may be more focused on this aspect to arrive at definite and firm conclusions.

The analysis of interpersonal orientation at the level of behaviour in isolated and extreme environment of Antarctica seems to pose enigmatic problem. On one hand, the need for association was greater than the need for personal intimacy with others. At the same time, the desire for close relationship from others was greater than the preference for social

interaction. The low need to express personal warmth and to be desired by others for interaction supports the earlier comments that the lack of personal sharing or emotional intimacy may actually be adaptive in this environment (Leon and Colleagues, 1989). Similar observations with respect to personnel in isolated and confined settings were made by other investigators (Palinkas et al., 2000b; Moes et al., 1996). The supportive evidences seem to suggest that personnel residing under prolonged isolation and confined environment preferred little social interaction and fewer acquaintances.

Also, the FIRO-B does not measure actual behaviour but rather the expressed and wanted need for such behaviour. Therefore, the finding that inclusion behaviour as compared to affection was low for wanted need than it did for expressed need signify that personnel were fairly satisfied with exchange of affection and warmth, but with regard to inclusion behaviour personnel preferred less invitation for interaction from others. The low need to be desired by others for interaction may be for various reasons such as lack of emotional intimacy, superficial relationships, fear of personal disclosure, etc.

Contrary to the expectation, the overall interpersonal behaviour showed significant improvement in the second half as compared to the first half of prolonged isolation and confinement. The present observation of significant improvement in the second half of the study period is not in agreement with previous studies which generally show that interpersonal relationship deteriorates during the second half of the mission (Rohrer, 1961; Sandal, 1999; Sandal et al., 1995; Bhargava et al., 2000). Although there was no evidence of improvement in interpersonal relations in the first versus the second half of prolonged isolation and confinement, some studies did support to certain extent that long periods of isolation and confinement in extreme environments generate positive forms of adaptation in certain individuals with a low need for social interaction (Palinkas et al., 2000b; Palinkas and Suedfeld, 2008).

As explained by Palinkas et al., (1995b), a possible reason for this positive reaction in interpersonal orientation at the behaviour level may be that polar environments are inherently less stressful than they are generally portrayed. The improvement in interpersonal behaviour in the second half of prolonged isolation may also be attributed to the individual themselves. For instance, it is stated that certain psychosocial characteristics combined with characteristics specifically adaptive for living in polar environment enabled individuals to cope with the isolated and confined environments

(Palinkas et al., 1995b). The other attributes that facilitated interpersonal behaviour may include subject characteristics, sample size, and rigorous psychological screening prior to expedition that ensured that participants have high degree of adaptability, motivation, and tolerance.

When evaluating the results of this study, the obvious limitations in study design must be kept in mind. For instance, this study collected data at only two time points, two months after deployment to Antarctica and two months prior to redeployment to India. A period of decline in interpersonal behaviour may have indeed occurred shortly after the midpoint of the expedition, but might not have been reflected in the observations. The significant improvement in overall interpersonal behavior at the second time point, therefore, may reflect simply the anticipation of the end of isolation and confinement.

From the present observations on the interpersonal behavior of the expedition members in Antarctica, it is rather difficult to lead to firm conclusions. The pattern of psychological reactions in people is not similar even in analogous environments of isolation such as space voyage and life at extreme altitudes. Even in earlier studies on this area, there are no firm observations of generalized pattern of behaviour (Sandal, 1999; Palinkas, 1992). Despite the limitations, this study provides interesting information regarding interpersonal behaviour, and we believe this will have useful implications in selection and training of personnel for long duration missions in isolated and confined environment.

CONCLUSION

The present study provides new perspectives on interpersonal dimension at feeling and behavior level. The interpersonal relations at feeling level are predominantly affection oriented with a halfway control orientation, and a low inclusion orientation. The interpersonal needs at the behaviour level are inconsistent, and the overall interpersonal behaviour has improved at the second half of prolonged isolation and confinement in extreme environment. This study has shed light on some psychological factors relating to interpersonal domains and these results will be increasingly important as more and more people, old and young, seek out the challenge and beauty of the circumpolar regions.

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