Fearless Temperament and Overconfidence in an Unsuccessful Special Forces Polar Expedition

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BACKGROUND: Assessment of the influence of personality and decision processes on the performance of two-person expedition teams has application for the composition of small teams for planetary exploration and potentially responding to off-nominal situations.

- **CASE REPORT:** We studied a two-man Special Forces team with a goal of reaching the North Pole in the shortest amount of time. Both subjects had high scores on measures of leadership/dominance, fearlessness, and achievement, and low scores on harm avoidance (high risk-taking). Differences were noted on scales measuring empathy, agreeableness, extraversion, emotional regulation, and callousness. Individual differences in the primacy of personal values of tradition vs. pleasure-seeking were evident.
- **DISCUSSION:** High dominance traits of both team members, incompatibility in other characteristics and values, and minimal pretraining had a significant impact on the decision to abort the trek because of severe frostbite suffered by one subject. Implications for dyads exploring the Mars surface are discussed.
- **KEYWORDS:** Personality, polar expedition, extreme environment, military teams, planetary exploration.

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ssessment of the personality characteristics of participants on polar expeditions continues to be a topic of interest in its application for the selection of small teams performing in other isolated and extreme environments, including planetary exploration. A series of investigations of the personality traits and performance of single gender and mixed gender polar expedition teams has replicated findings of low stress reactivity and risk taking propensity at an average level compared to population norms.⁸

Later studies have examined associations among personality traits and personal values of polar teams and those engaging in other types of expeditions. A longitudinal study of the special unit Danish Sirius Patrol teams operating in two-man teams monitoring the Northeastern coast of Greenland found a psychologically adapted group, relatively high on NEO PI-R² Openness and Agreeableness and Triarchic Psychopathy Measure (Tri-PM)¹⁰ Boldness scales.⁶ In addition, Portrait of Values Questionnaire (PVQ)¹⁵ findings indicated that the most highly rated personal values were Self-Direction (independence, autonomy), Universalism (feelings of one with nature and people), and Stimulation. Similarly, self-direction and stimulation were strong personal values of a two-man expedition team who reached the North Pole without outside support.⁷ The salience of self-direction was also evident in the personal values of a mixed gender group of astronauts, whose values were assessed through content analysis of diaries and other materials.¹⁴ Achievement, enjoyment, and self-direction were the most highly rated values.

In planning for future planetary expeditions, it is important to define some general principals across groups that can be applied to team selection and training. However, studies of human performance in extreme environments need to take into account individual differences among people and in the composition of particular teams, not only in personality and values, but also in gender, age, education, occupational level, and nationality. Personality traits that might be evident or adaptive

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in a particular team or in a specific situation might not prove adaptive in other teams or environments. Prior findings have shown that team autonomy accentuates the differences between team members and affects team functioning.⁹ In addition, the results of a meta-analysis indicated that variability in trait agreeableness was negatively related to team performance.¹³

The aim of this case report was to evaluate the personality characteristics, personal values, and decision processes of a military dyad in which both members had extensive leadership experience; the relationship of these factors to the success of their endeavor in an isolated and extreme environment was the topic of interest.

CASE REPORT

Both subjects were members of elite military commando units and had known each other for 12 yr prior to the North Pole trek. They had undergone arduous physical training and had considerable leadership experience. Subject #1, age 41, weight 95.2 kg, height 185.4 cm, described himself as follows: "I am by nature a robust (mentally and physically) individual who doesn't suffer fools. I make snap judgments and can rely on intuition too much, and tend to be very dismissive of people who do not live up to my expectation of what I believe is needed." Subject #2, age 32, weight 88.9 kg, height 190.5 cm, had relatively less experience in extreme environments, and did not offer a personal description. Both felt that the successful completion of the expedition would be a positive factor for their military units as well as their personal careers. The expectation was that the two would interact and make decisions as coequal partners.

Subject #1 initially contacted one of the authors, described the expedition goals and inquired whether there would be an interest in studying them. The investigators did not know either subject prior to the inquiry. Subjects were provided with and signed informed consent forms and completed the personality test battery approximately 4 wk prior to the flight to base camp. The measures included the Multidimensional Personality Questionnaire-Brief Form (MPQ-BF),¹¹ NEO Five-Factor Inventory (NEO-FFI),² Triarchic Psychopathy Measure (Tri-PM),¹⁰ and Portrait Values Questionnaire (PVQ).¹⁵ A postexpedition debriefing interview form also was part of the protocol; however, despite several prompts, Subject #2 did not return the form.

The goal of this unsupported ski expedition was to reach the Geographic North Pole in the shortest time possible. While both team members had prior experience in cold weather conditions, they had not trained together for this particular expedition and neither had experience trekking on the polar ice. Instead, they received advanced cold weather survival training at their base camp in Resolute, Canada, including practice in setting up their gear on the ice, prior to a planned start from Ward Hut Island, Canada.

Severe blizzard conditions over a several-week period prevented planes from transporting them to the drop-off point. Ultimately, they realized that they would not be able to reach their approximately 805 km goal in time for the arranged pickup by helicopter. As an alternative, they decided to reach the Magnetic North Pole. The air temperature during the trek was below -40°C and, with wind chill, approximately -50°C. On the fourth night on the ice, Subject #2 developed severe frostbite on several fingers and the thumbs of both hands while putting up the tent. Rewarming was started immediately. However, after prolonged discussion, the next morning a decision was made to abort the expedition to avoid the possibility of further refreezing of the affected frostbitten areas and possible permanent damage to the hands.

The MPQ-BF findings showed both similarities and marked differences between the two subjects on a number of scales (**Table I**). Both scored above the standardized mean on the Social Potency and Achievement scales, and below the mean on Harm Avoidance (high risk-taking) and the higher order Constraint factor. However, Subject #1 had considerably lower scores than his partner on the Social Closeness and Control scales and the Positive Emotionality factor. He also had relatively lower scores on the Harm Avoidance scale and Constraint factor, although these scores were well below the mean for both subjects. These findings indicated that both team members possessed strong traits reflective of leadership, dominance, visibility in social situations, achievement strivings, and high

 Table I.
 Personality Traits of the Participants Assessed by Measures Evaluating

 Different Facets of Personality.
 Personality

SCALE*	SUBJECT #1	SUBJECT #2
MPO Lower-Order Scales [†]		
Wellbeing	46	53
Social Potency	62	62
Achievement	62	58
Social Closeness	29	66
Stress Reaction	56	47
Alienation	56	52
Aggression	54	54
Control	27	44
Harm Avoidance	27	38
Traditionalism	48	40
Absorption	52	46
MPQ Higher-Order Factors [†]		
Positive Emotionality	50	68
Negative Emotionality	55	50
Constraint	27	37
NEO-FFI [†]		
Neuroticism	45	49
Extraversion	50	73
Openness	48	58
Agreeableness	>25	62
Conscientiousness	60	63
Tri-PM [‡]		
Disinhibition	0.42	0.10
Boldness	0.81	0.67
Meanness	0.54	0.14
	0.01	0.111

* MPQ = Multidimensional Personality Questionnaire; NEO-FFI = NEO Five Factor Inventory; Tri-PM = Triarchic Psychopathy Measure

⁺T-scores; standardized score with mean 50, SD 10.

⁺ Scores range from 0 (low) to 1 (high). Mean levels and standard deviations from an undergraduate student sample are provided as a basis for comparison; Boldness, 0.59 (0.12); Disinhibition, 0.24 (0.12); Meanness, 0.24 (0.15).³ risk-taking.¹¹ However, Subject #1's profile indicated poor empathy and closeness with others, and impulsiveness; conversely, Subject #2's profile indicated characteristics of strong positive emotionality and empathy with others.

The NEO-FFI findings supplement the MPQ-BF data. Subject #2 scored higher on the Extraversion, Agreeableness, and Openness factors. Of note is Subject #1's extremely low score on Agreeableness (T > 25), consistent with his low score on MPQ-BF Social Closeness.

The Tri-PM scale scores showed marked differences between the team members on levels of dispositional traits related to the construct of psychopathy. Subject #1 had elevated scores on all three Tri-PM scales relative to both Subject #2 and a sample of students (~ 2 SD greater than the comparison sample).³ On the Disinhibition scale, Subject #1 endorsed items related to impulsivity and boredom proneness, but not criminal behaviors or irresponsibility. The many items he endorsed on the Boldness scale included those related to tolerance for uncertainty, resiliency, and persuasiveness. The score elevation on the Meanness (callousness) scale was reflective of excitement seeking and a lack of empathy and emotional connectedness with others, rather than aggressive/sadistic behaviors toward other persons. Subject #2, however, scored comparably (within 1 SD) to a comparison sample on both the Boldness and Meanness scales, and relatively low (below 1 SD) on the Disinhibition scale.

The PVQ value hierarchies indicated that the teammates were similar on some factors, but scored quite differently on a number of others (**Table II**). The highest values on Subject #1's hierarchy were Achievement and Stimulation, tied for first place, and in descending order, Self-Direction, Tradition, Power, and Benevolence; Subject #2's value hierarchy, in descending order, ranged from Hedonism (pleasure-seeking), Stimulation, Achievement, and Benevolence and Self-Direction at the same level. In contrast, the lowest rated value for Subject #1 was Hedonism; for Subject #2, Tradition.

On the Post-Expedition Debriefing Form, disagreements/ differences of opinion that occurred most frequently on the ice were described by Subject #1 as follows: "I was keen to get the

Table II. Personal and Social Values Assessed Prior to the Expedition.

SCALE	SUBJECT #1	SUBJECT #2
PVQ* Centered Scores [†]		
Tradition	0.35	-1.48
Universalism	-0.82	-0.73
Self-Direction	0.6	0.27
Stimulation	0.85	1.1
Hedonism	-0.82	1.77
Achievement	0.85	0.52
Power	0.18	-0.23
Security	-0.55	-0.23
Conformity	-0.15	-0.23
Benevolence	0.1	0.27

* PVQ = Portrait of Values Questionnaire.

 † Items are rated on a 6-point scale ranging from 1 = not like me at all to 6 = very much like me.

A correction for individual differences in response style is applied by "centering" the mean of the raw score on each scale by subtracting the mean score of the rankings on all 40 items.

most mileage out of each day and have a tendency to keep pushing on. None of this met with (teammate's) expectations." For example, each morning Subject #1 wanted to pack up quickly and get started on the ice, while his report was that his teammate felt it was better to spend more time rewarming before setting out. As a result, Subject #1 went ahead but then had to wait later on for Subject #2 to catch up. Subject #1 indicated that these differences were never resolved.

DISCUSSION

The subjects were incompatible in many respects in regard to successfully carrying out a two-man expedition. The personality and values findings showed a number of similarities and differences that might have predicted significant problems in working together in a harmonious manner. The traits on which they were most similar, social potency, achievement motivation, and conscientiousness, likely led to disagreements on strategy, and at times, a lack of resolution. Therefore, the personality traits that would be highly effective in a single leader had a significant negative influence of the performance of these two particular individuals. Both team members indicated strong achievement and stimulation values, similar to the findings with astronauts.¹⁴ However, they differed from astronauts and each other on other strongly held values, i.e., tradition vs. enjoyment/pleasure, which may have influenced the timing on the decision to abort the trek.

Prior research (e.g., Bishop and colleagues¹) has indicated that all-male teams tend to be highly competitive with each other, although this finding has not been consistent across studies.⁷ A competitive orientation would appear to have an even more pronounced negative influence in a small group. Kanas⁴ found that the presence of two highly dominant persons in the same isolation condition engendered tension that was resolved by withdrawing from each other. However, the importance of appropriate communication for team effectiveness, including expectations about working together and team member personal goals, was emphasized in debriefing interviews with Danish special unit patrol teams.⁵

Subject #1's data reflected a person with a difficult and fearless temperament, highly action-oriented, antagonistic, and low in empathy toward others. A genetically based disposition toward low fear reactivity is a central hypothesis on the etiology of psychopathic personalities, and a phenotypic expression of boldness in particular.¹² In Subject #1's case, the low fear and high risk taking temperamental profile, when coupled with an absence of antisocial behavior, is indicative of trait dispositions that are conducive to high-risk prosocial environments, e.g., elite Special Forces military operations and some types of polar expeditions. Subject #2 showed high risk taking traits as well; however, he was high in positive emotionality and the trait of social closeness, i.e., empathy and concern for others, and extroversion.

The high boldness and fearlessness dispositions, particularly with regard to Subject #1, likely was reflected in an attitude of overconfidence, i.e., with their prior military training, it was not necessary to have extensive specialized training prior to the commencement of the trek, although neither of them had experience on the ice. However, since they did not spend time together in extended polar expedition training before their arrival at base camp, there was little opportunity for resolution of possible differences in approach to the daily trek. With prior extended training, there could have been more effective coordination of the routine as well as adjustments in strategy to deal with individual differences in physiological factors, such as speed of rewarming after cold exposure, and adjustment of the protective clothing and gloves. Therefore, the psychological characteristics of the dyad, such as fearlessness and overconfidence, directly impacted their ability to deal effectively with the environmental factors they were exposed to.

A limitation of this case report is that postexpedition debriefing information could only be obtained from one of the subjects, and thus the commentary is from his perspective. However, in our view these data nonetheless are informative in terms of applications for team composition and training in other extreme environments.

The strategy for exploration of the Mars surface likely will involve two crewmembers spending time away from the habitat for an extended period. It is important that there is compatibility in personality as well as skill factors. Status leveling will likely occur in terms of decision processes, requiring active cooperation between the dyad as well as with habitat and mission control in dealing with nominal and particularly offnominal situations.

Overall, there will be constraints on crew composition for a Mars mission related to factors such as representation from different countries and professional skills; however, within these parameters psychological testing as a component of the selection process can be helpful in composing crews with adaptive personality characteristics who are compatible working together. This information may also inform the kinds of countermeasures to be applied during a mission if individual or team performance problems arise.

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