

# **Psychology and Space Travel: Planning for a Mars Mission**

written by Anna Nicholson-Hutt on August 30, 2004

The vast blackness of space looms over the cabin windows, shrinking the flashing lights and metal contours of the control panels beneath the windows until your gaze is swallowed by the awesome unlimited expanse of jewel-studded space. Overwhelmed by the huge realm outside, you turn inward, to the crowded ship that carries five other people and a load of supplies and exploring equipment for your destination. The small ship, crafted so carefully to give as much space to its human operators as possible, offers no escape from the others or your difficult mission. How, then, can the crew avoid the inevitable tensions of close confines and the frustrations of high-stress environments? What keeps the crew from going mad and turning the shuttle into a nut house of the heavens? Returning your gaze to the outer darkness, you silently thank the skilled people who prepared you for this mission, not only the engineers but also the psychologists.

As we dream of sending a human crew to Mars, the psychological problems of such a mission loom large. If astronauts are not prepared enough to face the rigors of 2.5 years or more away from home and with a small group of others, the mission could fail and the crew could be lost. Realizing the potential for good and evil in the psyche, scientists have been studying the psychological aspects of group isolation in Antarctica, northern Canada, Mir, and examples from historical journeys. With the aid of this knowledge and other disciplines within psychology, such as organizational and social psychology, a crew bound for Mars can be readied for the challenge of their mission.

The first problem that comes to mind is the squabbles that develop among a small group of people stuck together for long periods -- a somewhat grander version of, "familiarity breeds contempt." When people are subjected to the personality quirks of their coworkers, they often become frustrated and argumentative. This problem becomes worse in a long-term space flight scenario, because there is nowhere conflicting parties can go to avoid each other. The combination of limited room in a spacecraft (or later, in a base on Mars) and the need for crew mates to work together means that personality conflicts must be accounted for and addressed.

One component of the solution to crew conflicts is crew selection. Firstly, the crew must be tested for psychological fitness (Cheston). The mixture of genders is also important. Studies of long-term isolation in Antarctica and a simulated Mars base in Canada show that a mixture of male and female crew members help alleviate conflicts. Charles Frankel, a habitant of the Mars base, noted that, "too many alpha males in a cramped space" were likely to display more stress, internal arguments, and problems with "ground control" (Hartmann, 438). Also, all male crews in the past have shown a tendency to hide emotions, thus increasing the likelihood of psychological problems. As for size, a crew of 7 best balances the need for a small crew with the expedience of varying personalities. However, a crew of 6 or 8 would allow for the ideal situation of having a crew made up of married couples, therefore relieving sexual tensions and loneliness. Furthermore, since wisdom comes with age but health does not, a middle aged crew would allow for relatively good health along with knowledge of social situations and problems (Sargent, 7). Selecting a crew that will work well together depends largely on crew size, disposition, and relationships.

Another part of solving crew problems is training. A crew that is trained together knows how to work together. They must be tested through group isolation on Earth before they are

sent to space in order to find and possibly eliminate personality problems. Crew members must learn communication skills and how to address problems before they affect the mission (Cheston). Extensive psychological training could help the crew understand each others' problems as well as their own and open the way for communication. Also, studies have shown that when people in long-term isolation learn that conflicts and problems are inevitable, they are less likely to suffer psychologically (Freiberg). Good training for a Mars mission must include psychology.

The second problem with long-term space travel is loneliness. Yes, even people who are crowded into a small area with several other people can be lonely. By going to Mars, a trip that could last 2 or more years, astronauts will be leaving behind many people that they love and all the social events that go along with living a normal life on Earth. Loneliness can cause a decrease in concentration of up to 28% (Sargent, 6). Add that loss to the weariness caused by lack of sleep due to confused internal clocks (Nepin) and the general stress of staying alert to the dangers of space flight and mission planners will find that eliminating loneliness brings a big boost in efficiency.

Loneliness can be prevented and treated several ways. While communication with the home planet may be slow, it is essential that crew members receive frequent messages from family, friends, and the world in general. Not only would such messages prevent the crew from feeling abandoned (Freiberg), but they would also provide the opportunity for psychologists on the ground to checkup on the psychological health of each crew member. Also, news from home will help astronauts feel less isolated. Crew selection could help with this problem as well. Introverts would be best suited to long-term isolation, since they rely less on others for emotional expression and stimulation. Also, young men suffer less from loneliness than older men (Weiner, 29). As long as the crew and ground control cooperate to fight loneliness and encourage communication, loneliness can be avoided.

Morale presents a third problem. Life on a Mars mission could become both tiresome and stressful due to an unchanging routine and high expectations. The inherent danger of traveling through space requires a level of vigilance that could wear on astronauts already beleaguered by dealing with crew conflicts. Too much work and no play, or vice versa, can cause tensions to rise. In order to prevent a mutiny or psychological meltdown, planning must include ways to invigorate crew morale.

The first way to boost morale involves livening up life on the shuttle or at the base. Variety must pepper the routine of the crew in order to prevent boredom. Diversions such as card games and movies have been used by polar explorers to enhance morale (Sargent, 4). Competitions provide some relief, as long as they are not taken too seriously. Astronauts should be encouraged to continue pursuing their hobbies. Even meals can provide a way to improve performance: with varied foods, astronauts can enjoy and even look forward to the novelty of each meal (Cheston). When used along with a known routine and set of duties for each crew member, variety can be very effective in boosting morale.

Psychological monitoring is a second solution. Self-reported morale ratings can be used daily to solve problems early. If a crew member consistently reports low morale, other crew members can try to cheer him up or resolve any problems he might be having (Neider, 425). Regular psychological tests administered by psychologists on Earth can be effective as long as they are not too intrusive. Psychological help should be used in a way that respects each crew member's independence (Freiberg). If crew members are knowledgeable about the importance of psychological monitoring and are honest in their responses, morale can be improved on an individual level.

Choosing an effective leader is a third and very important way to improve morale. Successful expeditions in the past owe a lot to good leadership. A leader that is charismatic, highly esteemed, and just will win the allegiance of the crew and be able to get the crew to work through problems effectively (Sargent, 5). During the planning and training stages of the mission, a crew member should be selected by his or her peers to lead the group. Such a leader must be able to relate to all the other crew members and know when to intervene in a conflict between two crew members. Someone who will take into account each member's opinion when making decisions and put the safety of the crew above his or her own will do more to promote morale than anything else. When a crew can follow a leader wholeheartedly, almost nothing can keep them from working together toward their goal.

All of these concerns present obstacles to the much anticipated Mars mission. However, with careful planning, these problems can be lessened or avoided altogether. Psychology has as much to offer as any other science when it comes to space travel. As long as future space explorers remember to respect psychology and learn from its experience, the mission to Mars will be a psychological success.

#### Works Cited:

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