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Abstract

This case study assessed the psychological strengths and stability of attitudes and values of a 29-year-old male who successfully completed a 260-day solo sailboat circumnavigation of the globe. Personality findings indicated positive psychological functioning; high scores on traits of boldness, agreeableness, and openness; and mid-range on extraversion. An internal locus of control belief orientation was evident from the pre- to post-voyage evaluation periods. Personal values of hedonism, universalism, and stimulation were the highest rated values over the course of the voyage. Positive adaptation was reflected in perceptions of personal growth, endorsement of positive experiences, and flexibility in using a variety of coping strategies depending on the situation. The mid-range level of extraversion and high trait agreeableness may be adaptive characteristics, reflecting comfort in solitude while possessing the ability and interest in communicating with others as a means of stimulation and social support.

Keywords

solo sailboat voyage, personal values, positive growth, adaptive coping

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Embarking alone on a sailboat in an attempt to circumnavigate the globe solo and non-stop presents many personal as well as environmental challenges. For some, a primary motivation is the fruition of a childhood dream to fully experience the sea. For others, it is the desire to be the first/fastest/youngest/oldest to engage in this pursuit and to test oneself in an extreme environment. Joshua Slocum, born in Nova Scotia, is credited with being the first person to sail solo around the world, a feat that extended between 1895 and 1898 (Slocum, 1899/2005). Slocum's description of his journey highlighted his courage, endurance, and resourcefulness; he also mentioned his loneliness during this endeavor, despite stopping at different ports along the way to give lectures about his experiences. Slocum also recounted several "sensed presence" experiences, that is, the perception that a benign person is looking over and helping him at a difficult time (Suedfeld & Mocellin, 1987).

The literature on solo voyagers and polar expeditioners has been primarily anecdotal in nature, based on diaries, later books, and interviews (Mocellin & Suedfeld, 1991; Stuster, 1996). These narratives have tended to focus on the realistic hardships experienced. For example, in recounting his solo 6-month winterover in a shack on Antarctica, Byrd (1938/2002) described problems with equipment, carbon monoxide poisoning, injuries, and dissatisfaction with personal hygiene. However, the diaries of various polar explorers also have mentioned positive experiences, such as serenity and enjoyment of the environment (Mocellin & Suedfeld, 1991). Other solo sailors, mountain climbers, and polar expeditioners also have reported sensed presence experiences (Suedfeld & Mocellin, 1987).

The first successful solo and unsupported trek to the South Pole by a woman was accomplished in 1994 by Liv Arnesen of Norway. While an experience of loneliness was mentioned, the positive experiences of coping with the challenges, enjoying the beauty of the environment, and satisfaction in being the first woman to reach the South Pole unsupported predominated (Arnesen, 1995).

An aim of the current case study was to obtain a better understanding of the personality characteristics and psychological strengths associated with the motivation to accomplish an arduous, solitary, long-duration and potentially dangerous pursuit in an isolated, confined, and extreme (ICE) environment. In this investigation, the focus was on one person in a small sailboat, attempting to circumnavigate the globe. Whether or not the participant was successful in reaching this goal, our view was that the psychological information obtained could be informative about the traits, attitudes, and behaviors that are optimal for engaging in long-duration solitary challenges. In addition, evaluation of the stability of beliefs and values following the journey

could inform about the psychological process of reintegration back into the usual environment.

Based primarily on interviews and transcript materials, Wolfe (1979) originated the term “the right stuff” to describe the challenging experiences of test pilots and early astronauts. The book did not contain formally measured personality data but instead focused on training and mission activities. At a later time, Chidester, Helmreich, Gregorich, and Craig (1991) used the Personality Characteristics Inventory (PCI) (Helmreich, Spence, & Wilhelm, 1981) to assess the personality characteristics of aviators in relation to job performance and applied the term “right stuff” to describe their findings. This research was followed by studies of groups in military training (Sandal, Endresen, Vaernes, & Ursin, 1999; Sandal et al., 1998) and polar expeditions (Sandal, Bergan, Warncke, Vaernes, & Ursin, 1996). Based on the results of these series of studies using the PCI, a “right stuff” personality configuration was designated characterized by high levels of positive instrumentality and positive expressiveness and low levels of interpersonal aggressiveness and competitiveness. This profile was viewed as optimal for effective team compatibility and performance; however, in our view, these characteristics may simply be reflective of positive psychological adjustment.

Using different personality measures, evaluation of two-person expedition teams (Leon, Sandal, & Larsen, 2011) and military patrol teams (Kjærgaard, Leon, Venables, & Fink, 2013) have found, on the whole, well-adjusted individuals, high in positive traits and low on neuroticism. A number of polar expeditioners studied (e.g., Atlis, Leon, Sandal, & Infante, 2004) exhibited the trait of absorption (Tellegen & Waller, 2008), that is, the tendency to become so engrossed in thoughts or perceptions that one does not pay full attention to ongoing circumstances. This trait may be highly adaptive in certain situations. For example, a focus on the beauty of one’s surroundings rather than the boredom and monotony that are part of difficult long-duration treks likely enhances the positive aspects of the experience.

Research on the performance of individuals in extreme environments has centered on group functioning. Gunderson (1974) found that emotional stability, task motivation, and social compatibility were the major components of effective performance in ICE environments. An interest in this case study was whether similar configurations of emotional and task effectiveness would be evident in one person performing alone in isolation in a highly challenging environment.

The concept of locus of control (LOC) also has relevance for the study of solo individuals performing in ICE conditions. LOC is a belief system with relevance for how a person may perceive life events and also cope with stressful circumstances. Rotter (1966) introduced the construct of internal

versus external LOC, conceived as a generalized expectancy that positive reinforcement is either internal, a result of one's own behavior, or external, a result of forces over which one does not have control. Levenson (1981) expanded on the measurement of externality to separately assess beliefs in fate or chance versus the expectancy that powerful others are in control of the situations that happen to one. It has been proposed that individuals with an internal LOC will be better able to deal with stress and adjust to stressful situations (Lefcourt, 1976).

Attitudes and values and possible changes in these factors through the experience of a solo voyage were a related topic of interest. Following the concepts proposed by Schwartz (1992), values were defined as motivational goals that are positive and trans-situational, providing guidelines for action. Values relate to the goals one wishes to pursue, and the standards for judging the behavior of oneself and other persons. Previous studies of expedition teams indicated that self-direction and stimulation were strong personal values that remained stable over the course of the treks and through later follow-up periods, whether a 55-day trek to the North Pole (Leon, Sandal, Fink, & Ciofani, 2011), or a full-year experience conducting patrol journeys in Greenland (Kjærgaard et al., 2013). Universalism, a feeling of harmony with other people and nature, was also found to be a strong value in the Kjærgaard et al. (2013) study and increased over time in the Leon, Sandal, Fink, & Ciofani (2011) study. The participants in both studies rated the values of tradition, power, and conformity as lowest on their value hierarchies.

Content analysis of the memoirs or diaries of astronauts who had flown in space indicated that achievement was the value that was most frequently mentioned; there was an increase post-flight in the value of transcendence (a combination of universality and spirituality; Suedfeld, 2006). Analysis of a larger group of astronaut space flyers demonstrated the salience of the values of achievement, enjoyment, and self-direction (Suedfeld, Legkaia, & Brcic, 2010). Retired male cosmonauts showed an increase in the value of self-direction post-flight (Suedfeld, Brcic, Johnson, & Gushin, 2012).

While studies of individuals or groups in challenging situations have tended to focus on the stresses and negative aspects of the experience, there has been less attention paid to the process of salutogenesis, that is, a sense of positive growth and meaning, and an improvement in functioning following the event (Antonovsky, 1987). Tedeschi and Calhoun (1996) focused on the personal growth that can occur through having gone through a highly traumatic situation. The growth experience can involve a changed sense of relationship with others (Malinak, Hoyt, & Patterson, 1979), a strengthening of self-concept (Thomas, DiGiulio, & Sheehan, 1991), and a reinterpretation of the meaning of the events that one has experienced (Kahana, 1992). Studies

of polar expedition and military patrol teams have shown that personal growth occurs not only in traumatic but also in environmentally challenging conditions (Kjærgaard et al., 2013; Leon, Sandal, Fink, & Ciofani, 2011).

The aim of the current study was to identify the combination of factors associated with success in carrying out a highly challenging pursuit in an ICE environment, in this case, a long-duration solo sailboat voyage circumnavigating the globe. Personality factors, personal values and attitudes, coping patterns in dealing with the challenges of the journey, and aspects of personal growth were also of interest. We also assessed possible changes in personal attitudes and beliefs after the voyage was completed. We did not aim at replicating the particular personality configuration designated by Chidester et al. (1991); we chose empirically derived personality measures that we judged to be of greater relevance for this study and used the term “right stuff” as an underlying construct reflected by this particular personality configuration. We hypothesized that the participant would exhibit positive personality traits, score high on measures of openness to experience, absorption, and boldness, and highly value self-determination, universality, and stimulation. We also hypothesized that internal LOC beliefs would show variation across the challenges of the voyage. Consistent with the findings from other types of expeditions, we hypothesized that the participant would use an array of problem, emotion, and meaning-focused coping strategies and that positive mood would predominate over negative mood throughout the journey. We also expected that a perception of personal growth would occur following the voyage, irrespective of its success.

Method

Participant

C. was 29 years old at the time of the voyage. He completed 10th grade, followed by a 6-month stint on a training ship. He then attended navigation school, earned a master's degree in navigation, and worked at a number of jobs on various ships. He also had been a member of a highly selective military special unit. C. indicated that sailing solo was a dream that began in childhood and strengthened as he grew older and received sailing and other ship training.

Measures

Danish language versions of all measures were used; translation and back translation procedures were carried out for all measures. A Danish language version of the NEO Personality Inventory–Revised (NEO PI-R) already exists.

NEO PI-R (Dansk). A 63-item standardized Danish version of the NEO PI-R (Costa & McCrae, 1992) measuring five independent personality traits: Neuroticism, Extraversion, Openness, Agreeableness, and Conscientiousness. Internal consistencies of the five factors ranged from .86 to .92, test-retest reliabilities from .86 to .91. The factors assessed on this measure have been shown to have considerable cross-cultural stability (McCrae & Allik, 2002).

Triarchic Psychopathy Measure (Tri-PM). The Tri-PM (Patrick, 2010) is a 58-item measure assessing Boldness, Meanness, and Disinhibition factors of psychopathy. The Boldness factor reflects interpersonal characteristics of social dominance, venturesomeness, and relative immunity from fear and stress, thus remaining calm in stressful and dangerous situations. The Disinhibition factor reflects a tendency toward impulsivity and a lack of behavioral restraint. The Meanness (callousness) factor reflects cruelty and deficient empathy. The items on each scale are summed and then prorated so each scale ranges in value from 0 (low) to 1 (high).

Multidimensional Personality Questionnaire (MPQ) Absorption and Achievement scales. The MPQ (Tellegen & Waller, 2008) Absorption and Achievement personality traits were assessed. Six items from each of these scales were selected for this study; items were scored as 1 = *true* or 2 = *false*.

Portrait Values Questionnaire (PVQ). The PVQ (Schwartz, 1992; Schwartz, Melech, Lehmann, Burgess, & Harris, 2001) is a 40-item inventory measuring 10 major distinct values and the perceived importance of these values. The scales are as follows: Tradition, Universalism (appreciation for and protection of the welfare of all people and nature), Self-Direction, Stimulation, Hedonism (pleasure, enjoyment of life), Achievement, Power (social status, dominance over others), Security, Conformity, and Benevolence (help and care for people one knows and likes). Each item presents a brief gender-matched description of a person's goals, aspirations, or wishes that reflect the importance of a particular value. A 6-point scale is used for the respondent to rate how much this person is like him or her. The individual scales are scored by applying a correction for individual differences in response style. The mean of the raw score on each scale is "centered" by subtracting the mean score of the rankings on all 40 items (Schwartz, 2006). Across scales, test-retest reliabilities ranged from .66 to .84. The discriminant validity of the 10 PVQ values across cultures was demonstrated by studies in a large number of countries (Schwartz, 1992, 2006; Schwartz et al., 2001).

Levenson Locus of Control Scale (LOC). An 11-item shortened version of the Levenson (1974) multidimensional LOC measure consists of the following scales: Internality, Powerful Others, and Chance. The latter two scales separate out different facets of an external orientation. Powerful Others refers to a belief in a basic order of the world but with the expectancy that others are in control; Chance refers to a belief in a random and unordered world. In a student sample, internal consistency for the full measure Internality scale was .64; Powerful Others, .77; Chance, .78 (Levenson, 1981). Items are rated on a 6-point scale ranging from +3, *agree strongly*, to -3, *disagree strongly*.

Posttraumatic Growth Inventory (PTGI). The PTGI (Tedeschi & Calhoun, 1996) is a 21-item five-scale measure developed to assess positive outcomes following the experience of traumatic events. The items also have application for other types of stressful or challenging situations. The participant was asked to indicate “the degree to which this change occurred in your life as a result of your experiences on your solo journey.” The items are scored on a scale from 0, *I did not experience this change as a result of my journey*, to 5, *I experienced this change to a very great degree as a result of my journey*. The scales are as follows: Relating to Others, New Possibilities, Personal Strength, Spiritual Change, Appreciation of Life. Internal consistency of the PTGI was .90; test-retest reliability, .71 (Tedeschi & Calhoun, 1996).

Weekly Rating Form (WRF). Versions of this 69-item rating form have been used in previous expedition studies (e.g., Leon, Atlis, Ones, & Magor, 2002; Leon, Kanfer, Hoffman, & Dupre, 1991; Leon, Sandal, Fink, & Ciofani, 2011; Kjærsgaard et al., 2013) and was modified as needed for the circumstances of the voyage. The sections are Feelings and Emotions (Positive and Negative Affect Schedule [PANAS]; Watson, Clark, & Tellegen, 1988), Environmental and Physical Factors, Positive and Negative Event Checklist, and Coping Checklist composed of coping strategies reported over a 7-day period by a group of Army recruits undergoing basic training (Ben-Porath, Leon, Rinehart, Gupton, & Sineps, 1991). The participant was instructed to do the ratings focused on the situation on that particular day. For the Day 260 rating, C. completed the WRF when he came ashore. He was instructed to do the ratings based on how he experienced the last day of the voyage.

Debriefing interview. A semi-structured interview was developed to assess in greater detail the information obtained on the psychometric measures.

Procedure

The participant completed the personality, attitude, and value measures 14 days prior to the start of the voyage; he completed the WRF once a week over the 260-day course of the voyage. At the 100- and 200-day voyage periods, C. completed the LOC, PVQ, PTGI, and the interview form; the latter was sent to him via email and he transmitted the data to the investigators via satellite phone or laptop computer. Debriefing interviews were carried out 21 and 180 days after the end of the voyage by one of the investigators (A.K.); the LOC, PVQ, and the PTGI were re-administered at 30 and 180 days post-voyage. The participant and one of the investigators were acquaintances; they mutually agreed on conducting this research.

Voyage Details

C. prepared for 9 months for the circumnavigation. He teamed up with two highly experienced Scandinavian ocean sailors, who served as his mentors. One of them was the first Scandinavian to complete a non-stop circumnavigation. They were also his advisory team during the voyage; C. was in almost daily contact with them regarding equipment, weather conditions, and especially when difficult decisions were about to be made. The voyage lasted for 260 days, starting off from Skagen Harbor in Denmark and ending in the English Channel off the south coast of England, within sight of land. The ultimate goal of finishing the voyage by returning to Skagen Harbor could not be accomplished because the ship's mast broke on Day 260 in severe weather conditions and C. had to be evacuated to the shore. However, C. was successful in his goal of circumnavigating the globe, that is, crossing his own departure line in the English Channel at Brest-Lands End, alone and without stops along the way. In addition to the breaking of the mast, during the journey, there were additional challenges with some of the equipment, for example, a broken wind rudder. Storms and other weather conditions also proved to be significant challenges. The following are some of the milestones of the voyage: Day 42, crossing the equator (south); Day 100, on the way into the South Sea; Day 174, passing Cape Horn; Day 217, crossing the equator (north); Day 258, crossing his own departure line at Brest-Lands End.

Statistical Analyses

Descriptive statistics were used to evaluate the findings of the study.

Table 1. Personality Findings on Measures Administered Prior to the Voyage.

NEO Personality Inventory–Revised (NEO PI-R) ^a	
Scale	
Neuroticism	40
Extraversion	50
Openness	59
Agreeableness	60
Conscientiousness	38
Triarchic Psychopathy Measure (Tri-PM) ^b	
Boldness	0.67
Disinhibition	0.28
Meanness	0.18
Multidimensional Personality Questionnaire (MPQ) ^c	
Absorption	1.0
Achievement	1.5

^aT-scores.

^bScores range from 0 (*low*) to 1 (*high*). Mean levels and standard deviations from an undergraduate student sample (mixed gender, $N = 583$) are provided as a basis for comparison; Boldness, .59 (.12); Disinhibition, .24 (.12); Meanness, .24(.15) (Drislane, 2011).

^c1 = true; 2 = false.

Results

Personality

The NEO PI-R findings demonstrated that C. is a well-adjusted individual, low on Neuroticism, and relatively high on positive traits. The highest scale scores were on Agreeableness and Openness, indicating the ability to get along with others, and interest and engagement in new experiences. The mid-range Extraversion score suggests comfort in either being alone or with other people. The relatively low Conscientiousness score may reflect a tendency to work according to one's own schedule rather than following deadlines. On the Tri-PM, C. scored high on Boldness and low on Disinhibition and Meanness. This scale score configuration indicates strong adventurous characteristics, within the context of good emotional regulation and low personal aggressiveness. MPQ findings showed a high score on the trait of Absorption and a mid-range score on Achievement. All of the Absorption items were positively endorsed, indicating the ability to become highly engrossed in internal thought processes or in viewing the environment to the extent that less attention is paid to the ongoing events. The personality findings are presented in Table 1.

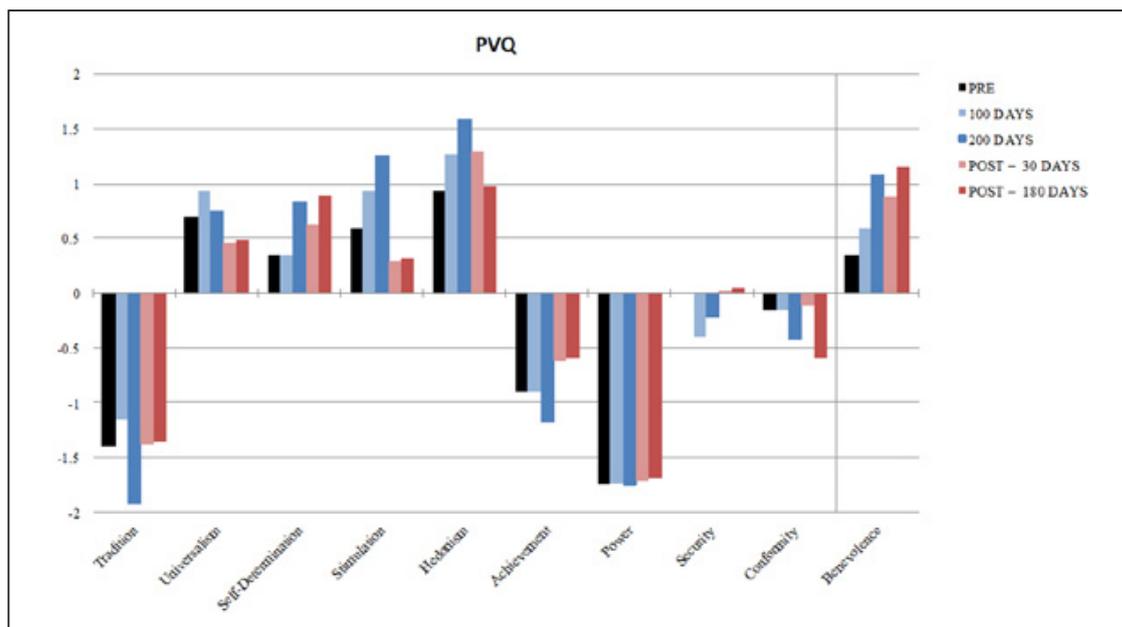


Figure 1. PVQ value hierarchies at pre-voyage, voyage intervals, and post-assessment periods.

Note. PVQ = Portrait Values Questionnaire.

Values and Beliefs

The PVQ data were analyzed over the five intervals of administration, from the pre-journey period to the second post-180-day follow-up. Over the course of the journey, Hedonism, Universalism, and Stimulation were the highest rated values; Benevolence and Self-Determination showed increases over the journey. Power, Tradition, Achievement, and Conformity were the lowest rated values over the course of the journey and at the two follow-up periods. Hedonism remained high at all assessments. At the post-180 day period, Benevolence and Self-Determination maintained the increases evident during the journey; however, there were marked declines in Stimulation and Universalism at both post-journey evaluations. The findings are presented in Figure 1.

The belief system regarding the ability to control one's life circumstances showed strong stability over the course of the journey and at the follow-up. The mean score on the LOC Internality scale remained high at each administration, while scale scores reflecting beliefs or expectancies in Chance and Powerful Others were uniformly low. The LOC findings are presented in Table 2.

Personal Growth

The PTGI ratings at intervals during the journey and in the two follow-up periods showed a fairly consistent pattern of personal growth, particularly

Table 2. LOC and PTGI Scale Scores Across the Evaluation Periods.

Scales	Pre-14 days	100 days	200 days	Post-30 days	Post-180 days
	LOC ^a				
Internality	2.0	1.87	2.12	1.87	1.87
Powerful Others	1.5	1.0	1.5	1.0	1.0
Chance	1.0	1.0	1.0	1.0	1.0
	PTGI ^b				
Personal Strengths	—	3.5	3.5	3.75	4.25
New Possibilities	—	2.6	3.6	3.8	4.2
Appreciation of Life	—	3.67	3.33	3.67	4.0
Spiritual Change	—	2.0	1.5	2.0	2.0
Relating to Others	—	3.43	2.86	3.57	4.29

Note. LOC = locus of control; PTGI = Posttraumatic Growth Inventory.

^aLOC scores range from $-3 =$ strongly disagree to $+3 =$ strongly agree.

^bPTGI items were rated on a 6-point scale from 0, *I Did Not Experience a Change as a Result of My Journey*, to 5, *I Experienced This Change to a Very Great Degree as a Result of My Journey*.

comparing the 100 Day to the post-180 Day ratings. Increases in perceived positive change were evident on all scales except the two-item Spirituality scale, on which one of the two items assesses religious convictions. The score on the “Relating to others” scale changed as follows: 100 days, 3.43; post-180 days, 4.29, indicating behavioral as well as attitudinal growth in interpersonal relationships. The complete PTGI findings are presented in Table 2.

Weekly Ratings

There was no indication of sensed presence experiences on the WRF. The PANAS positive affect (PA) and negative affect (NA) ratings were averaged across the entire voyage period. PA predominated over NA: PA 2.81 (.27), NA 1.06 (.05). In addition, the PA and NA scores were plotted at each of the 35-rating intervals. The third quarter was judged to start at Week 18 (Day 126); while C. obviously had no indication of an early termination of the voyage, his expectation was that he would reach Denmark in approximately 260 days. Inspection of Figure 2 indicates that at the third quarter, there was a decline in PA but no change in NA.

Each of the Events and Coping items endorsed on the WRF were summed and averaged over the following time intervals: 1 to 100 days, 101 to 200 days, 201 to 260 days, Overall. The data indicate that many positive events were consistently experienced over the course of the voyage. The items

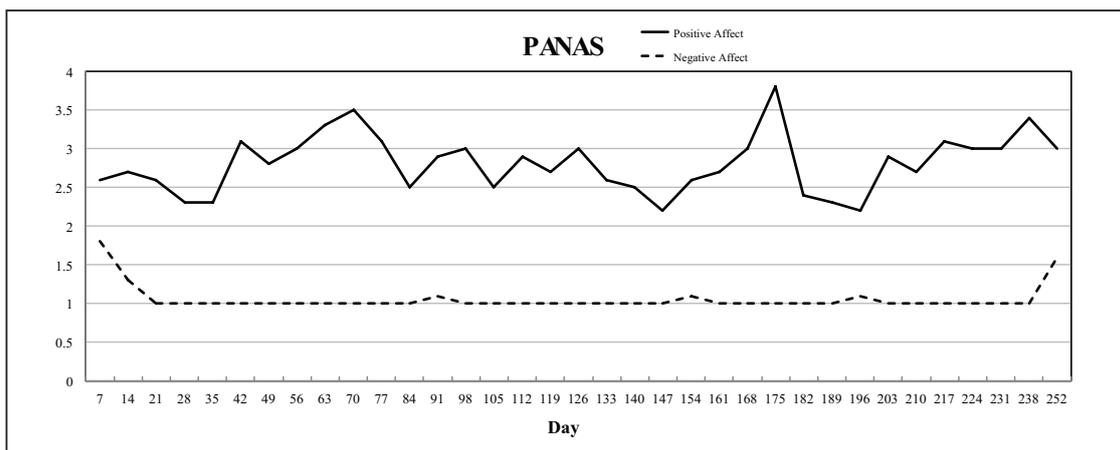


Figure 2. Weekly Rating Form (WRF) positive affect (PA) and negative affect (NA) scores over the course of the voyage.

Note. Items are rated on a scale from 1 = *not at all, very little* to 5 = *extremely*. PANAS = Positive and Negative Affect Schedule.

include “Enjoyment of the surroundings,” “Satisfaction in making good progress today,” “Satisfaction that the equipment is working properly,” “Satisfaction that I am able to cope with the challenges.” Over time, there was a decline in “Fear of being injured,” “Concern about my well-being,” and “Concern about my work effectiveness.” The complete Event ratings are presented in Table 3.

The Coping ratings indicated that the participant was flexible and endorsed an array of coping strategies over the voyage period. Emotion-focused strategies included “Talked to others (email or phone)” and “Relaxed, meditated, listened to music, daydreamed”; problem-focused strategies included “Tried to figure out how to solve the situation that’s bothering me”; and meaning-focused strategies included “Saw the situation in a very positive way, what I’m learning and getting out of it,” “Kept the goal in sight,” and “Thought about finishing the journey and why I’m here.” The complete Coping ratings are presented in Table 4.

An item rated on a scale from 1 (*not at all*) to –10 (*the most possible*) assessed the confidence level that the journey would be successfully completed. The ratings showed high confidence at all time periods: 0 to 100 days, 7.0; 101 to 200 days, 7.4; 201 to 260 days, 7.67.

Interview Material

The excerpts below were chosen from statements written during the email voyage assessments, or at the 21- or 180-day post-voyage debriefing

Table 3. Weekly Rating Form (WRF) Mean Endorsement Score on Events Experienced at Different Segments of the Voyage.

Items	0-100 days	101-200 days	201-260 days	Overall M (SD)
Problems with gear and equipment, including clothing, sleeping bag, tools, communication equipment, etc.	0.79	0.07	0.33	0.4 (0.49)
Concern about my well-being	0.5	0.33	0.17	0.37 (0.49)
Enjoyment of the surroundings	1.0	0.93	0.83	0.94 (0.24)
Concern about my work effectiveness	0.43	0	0.17	0.20 (0.41)
Feeling down/low or stressed	0.07	0.07	0.17	0.09 (0.28)
Satisfaction in making good progress today	1.0	0.87	0.5	0.86 (0.36)
Satisfaction that equipment is working properly	0.79	1.0	1.0	0.91 (0.28)
Satisfaction that I am able to cope with the challenges	0.93	0.87	0.83	0.89 (0.32)
Concerns about the effectiveness or safety of decisions I made today	0.14	0	0.17	0.09 (0.29)
Fear of being injured	0.71	0.53	0.17	0.54 (0.51)
Worried about family, friends	0.07	0	0	0.03 (0.17)
Loneliness, homesickness	0.14	0.27	0.17	0.2 (0.41)
Personal hygiene (wanting to be cleaner)	1.0	1.0	1.0	1.0 (0.0)
Lack of stimulation	0.36	0.27	0.83	0.4 (0.5)
Worried about encountering bad weather	0.93	0.8	0.17	0.74 (0.44)

Note. 1 = yes; 0 = no. Mean score (SD) on items endorsed at each of the voyage segments.

interviews and will be noted accordingly. The particular excerpts chosen are confirming quotations in the voyager's own language to illustrate processes of coping and growth through the experience of the solo voyage.

Table 4. Weekly Rating Form (WRF) Mean Endorsement Score on Coping Mechanisms Used at Different Segments of the Voyage.

Items	0-100 days	101-200 days	201-260 days	Overall M (SD)
Told myself, "take it one day at a time. Live with it, accept it."	1.0	1.0	1.0	1.0 (0.0)
Talked to others (mail/phone).	1.0	1.0	1.0	1.0 (0.0)
Tried harder. Pushed myself to do my best, told myself I can do it.	0.64	0.0	0.17	0.29 (0.45)
Prayer.	0.21	0.0	0.17	0.11 (0.32)
Saw the situation in a very positive way, what I'm learning and getting out of it.	0.79	0.93	1.0	0.89 (0.32)
Kept a positive attitude. Humor, joking around, having fun.	1.0	1.0	1.0	1.0 (0.0)
Cried	0.07	0.0	0.0	0.03 (0.17)
Relaxed, meditated, listened to music, daydreamed.	1.0	1.0	1.0	1.0 (0.0)
Kept the goal in sight. Thought about finishing the journey and why I'm here.	1.0	1.0	1.0	1.0 (0.0)
Thought of something pleasant such as good times to come.	1.0	1.0	1.0	1.0 (0.0)
Tried to figure out how to solve the situation that's bothering me.	1.0	1.0	1.0	1.0 (0.0)
Negative feelings about myself	0.14	0.0	0.0	0.06 (0.24)
Yelled, stomped, threw things around	0.0	0.13	0.5	0.14 (0.36)

Note. 1 = yes; 0 = no. Mean score (SD) on items endorsed at each of the voyage segments.

Most stressful event. The most stressful experience during the voyage was the damage to the sailboat, necessitating evacuation from the boat.

Post-21 days. When the wind rudder broke combined with the big wave that caused the damage . . . When the mast broke I had to act quickly and rationally.

C. indicated using a range of activities to cope with the isolation and the monotony of the environment. A number of these strategies were verbal: listening to audio books and talking to himself.

Coping with the isolation

Post-21 Days. Because there are really a lot of similar days, which is the biggest challenge—not going crazy with the monotony, the same environment, decor, food, your own company and limited movement possibilities . . . In the evening I read and listened to audio books. In the morning, I often listened to show podcasts . . . I talked every day loudly. I often commented on the trip as if I were telling others what I saw. If I saw something when I was standing at the mast, I went down and told it to anyone. It was often the computer. It was a great listener . . . Sometimes I could get a little crazy. It was towards the ending of the journey in particular. So I just went out and screamed. And then I laughed about it afterwards . . . Very primitive, but it works.

Much of the preparation for the voyage involved cognitive imaging and practicing of different scenarios.

Preparation for handling stressful events

Post-21 Days. I had imagined most scenarios before departure, so I felt well prepared. At the same time I was also developing as a sailor along the way, which gave me an increasing confidence and knowledge in stressful situations . . . Fortunately, I have a high stress threshold, so it takes a lot to get me “freaked out.”

C. was realistic in indicating the risks of the voyage and showed considerable insight in placing the importance of his attempt within the context of other significant events.

Preparation for the ultimate—Risk of death

Post-21 Days. I was well aware that I might not come back again and I had thought about that. I had asked myself—again a scenario: I saw myself falling overboard or the ship was sinking and I was unable to get help and how I would feel if I was well aware that in a minute I would die of cold or drown. Would I

regret that I had left or say it's ok? And I imagined, at least before I went off, I thought I could say that it was worth it. But I'm not quite sure afterwards. But before I wanted it so much—to sail around the world. Sometimes out there I thought: Could I forgive myself if this goes wrong or think it was ok? Whether it was worth it? Because this cruise, it will not save anything. Nothing cancer preventive or something. It's just my total selfish dream to sail around the world and test myself and take the undisputed most extreme sailing trip you can take in the whole world. Was my life worth it? I think it was before (I left) but it throttled down a bit along the way.

Cognitive appraisal as a coping strategy was evident in C.'s views about how his solo voyage ended and its relationship to other possible events in his life.

Dealing with the unexpected end of the voyage

Post-21 Days. To see the mast break, which of course is a pretty vital part of such a ship, it's like breaking a leg. And so it almost felt that way too. It nearly did hurt physically to watch her break. It was just miserable, but also, I was ready to come home . . . it was an amazing place where it happened. Imagine if it had happened in the middle of the Southern Ocean or in the Pacific . . . I hardly dare to think about it. Also it could have happened under much worse weather conditions . . . So really it was extremely fortunate. It was a starry night and I could see the countryside and the evacuation all went smoothly. So it was almost touching how fortunate a place it happened in.

The positive events anticipated and experienced related to achieving a dream come true, as well as engagement in the beauty of the environment and the creatures within it.

Expectation of most positive experiences

100 Days. The satisfaction of doing what you want—a dream being realized and it comes true. To see the nautical maps knowing that you are moving around in the world's oceans.

Actual most positive experiences

Post-21 Days. To complete the journey . . . to achieve my greatest goal was very satisfying . . . It was going very well, both with the ship, but also myself. I didn't lose my mind and furthermore I constantly felt that the mood curve was rising, which was very nice . . . There were also some experiences with dolphins and beautiful sunsets, which are great to look back on. Also, I'm glad that it has inspired people to seek their own specific dreams . . . So all in all, I enjoyed the trip.

In working alone, C. indicated greater feelings of self-efficacy and inner peace.

Most positive in working alone

Post-21 Days. It is always exciting to see how much you can do, how far you can go and maybe find out what type of person you are. This circumnavigation of the world has made me much more self-conscious and there is now an inner peace that gives extra resources to help and motivate others . . . To find out you can handle even very difficult and demanding challenges in sometimes extreme environmental conditions. At the same time, also the experience that we can constantly develop ourselves mentally. It is a never-ending project . . .

Most difficult or challenging in working alone

Post-180 Days. Sometimes I can easily leave things undone if it gets too complex, or I think it is too stupid and I lose interest . . . It is the pulling yourself up every day to perform your best even if you would really want to relax . . . Also, from time to time it was difficult to see the meaning of what you have started.

C. also appeared to have considerable insight about his strengths as well as weaknesses.

Most important strengths and weaknesses

Post-180 Days. Strengths: I think positively and see opportunities. Weaknesses: Tendency to “jump over where the fence is lowest” if things become too complex . . . Sometimes I am not structured and do not bother with things that do not interest me.

Discussion

Resilience has been defined as “successful adaptation despite risk and adversity” (Masten, 1994, p. 3) and also more broadly as “sustained competence under threat and recovery from trauma” (Masten, Best, & Garmezy, 1990, p. 426). A related construct, hardiness, is a broader factor that includes resilience and encompasses positive performance in the face of challenges, perception of control of one’s life, enjoyment of new situations and challenges, and internal motivation (Kobasa, 1979; Maddi & Kobasa, 1984).

The findings of this case study clearly point to C.’s resilience and hardiness in coping with the challenges he faced during the voyage, mastering adversities through flexibility in using a range of adaptive coping strategies,

and moving forward in his life in a positive manner as reflected in the strong evidence of personal growth, despite having to end the voyage before returning to his home harbor. The relationship between resilience and positive emotions is also of interest. Ong, Bergeman, Bisconti, and Wallace (2006) found that the experience of positive emotions is a factor in aiding high-resilient individuals to recover effectively from adversity. Of note, over the course of the voyage, positive affect predominated over negative affect.

The personality findings were consistent with the hypothesis that C. would exhibit adaptive psychological characteristics, particularly personality traits of openness to new ideas and experiences, absorption, and boldness. The ability to become highly engaged in the beauty and majesty of the environment and, thus, pay less attention to long stretches of boredom and monotony is clearly adaptive for engaging in a long-duration solo voyage. His balanced, mid-range score on extraversion was also adaptive; he was not in need of intense stimulation through personal contact with other people, but on the contrary, he found it rewarding to engage in communication with and receive social support from others via electronic media. The periodic contact with one of the investigators in transmitting the study materials and contact with his girlfriend and support team also might have been helpful in alleviating a feeling of intense isolation. The high boldness trait without the accompanying behavioral disinhibition and emotional callousness as seen in psychopathy was also positive in separating out adventuresomeness from maladaptive externalizing traits and behaviors (Venables, Hall, & Patrick, 2014). While one cannot posit a cause and effect relationship between personality traits and successful performance in this solo voyage, the associations noted are compelling.

Over the course of the voyage, C. showed considerable stability in some of the values he identified himself with, such as hedonism and benevolence, and changes in other values. Consistent with our hypothesis, the personal values of universalism and stimulation remained high; however, self-determination was not viewed as a significant personal value until the Day 200 period of the voyage. The decline in the post-voyage period in the valuation of stimulation and universalism may be part of a psychological recovery process following the intense challenges of the adventure. On the contrary, power, tradition, achievement, and conformity remained consistently low throughout, pointing to an individual whose values are different from stereotypic societal views.

Clearly, planning for and carrying out a solo voyage following a dream since childhood reflects a strong achievement motive, although not the kind of achievement or power value that is associated with traditional concepts of social success. However, the value hierarchy C. exhibited was consistent with

the values expressed by a two-person expedition team (Leon, Sandal, Fink, & Ciofani, 2011) and a Danish military Greenland patrol group (Kjærgaard et al., 2013), suggesting that the characteristics associated with low valuation of stereotypic societal values are not specific to people who engage in solo endeavors. On the contrary, the high-achievement values expressed by space flyers (Suedfeld, 2006; Suedfeld et al., 2010) may represent the values of individuals who have followed a more traditional societal path to their highly challenging occupational activities.

Contrary to our hypothesis, C. indicated a stable internal LOC belief from the pre-voyage through the post-voyage evaluation periods, irrespective of the damage to the sailboat and the evacuation to shore. In maintaining a belief orientation that he was the master of his own destiny, it is likely that he was able to make a distinction between his ability to control his life in general and the uncontrollable exigencies of Nature. This belief system is clearly adaptive in dealing with disappointments over which one does not have personal control; a relationship between high externality and psychopathology has been found in a number of studies (e.g., Dag, 1999; Mellon, Papanikolaou, & Prodromitis, 2009; Papanikolaou et al., 2013).

Following the delineation of types of coping strategies proposed by Folkman and Moskowitz (2004), the weekly ratings carried out during the voyage showed, as hypothesized, that C. was flexible in using a variety of coping strategies: palliative emotion-focused such as relaxation, meditation; problem-focused, trying to figure out how to solve the situation that is of concern; and meaning-focused, viewing the situation in a positive way, thoughts about finishing the journey, and the reason for being in the situation. These findings are also an indication of adaptive functioning within the context of a challenging situation and consistent with the findings from a group of polar military patrol members (Kjærgaard, Leon, & Fink, 2013). In addition, C. dealt with solitude by talking to himself throughout the day and sometimes screaming as a means of catharsis; however, these behaviors were adaptive within the context of his overall well-adjusted personality configuration, may have served as a break from auditory monotony, and were not an indication of psychopathology. Meaning-focused coping in terms of positive reappraisal was evident in post-voyage comments regarding what he learned about himself. C. also used social support in terms of contact with family and friends at home, demonstrating an ability to maintain a connection with others.

As expected, the weekly ratings showed a strong predominance of positive mood throughout the voyage. The findings regarding a third-quarter phenomenon positing a decline in mood and performance were mixed (Bechtel & Berning, 1991). There was a decline in positive affect during this quarter

but no change in negative affect. This finding is consistent with the mood changes observed in a group ice-locked in the Arctic during the winterover period (Leon et al., 2002). In addition, the interview material showed the salutogenic effects of the experience: the enjoyment of nature, testing himself and finding out that he was competent and could handle the challenges, achieving the goal of sailing alone around the world and without becoming “crazy,” all resulting in a feeling of inner peace. The many positive experiences noted support the findings of others regarding the positive experiences associated with functioning in an ICE environment (Leon, Sandal, & Larsen, 2011; Sandal, Leon, & Palinkas, 2006; Suedfeld, 2002).

The perception of personal growth at points during and following the voyage was consistent with our hypothesis, and another indication of the positive functioning of this individual. He was able to view his circumnavigation as successful even though he did not get all the way back to his home harbor. There was satisfaction in having engaged in his long-standing dream and successfully coping with the challenges of a solo voyage. Of interest, there was an increase in the post-voyage period in views about personal growth in relating to others. This behavioral aspect of personal growth in the context of having engaged in a 9-month solo voyage suggests a greater appreciation of other people as a result of the experience of isolation.

Thus, in an answer to the question of the “right stuff” for successfully engaging in a long-duration solo endeavor, one can point to Gunderson’s (1974) formulation of effective team performance: emotional stability, task motivation, and social compatibility. C. clearly exhibited emotional stability and task motivation. While social compatibility in terms of working with others was not relevant for sailing solo, perhaps this characteristic is nonetheless important in positive psychological functioning in challenging situations. His high score on the personality trait of agreeableness and the use of electronic means to stay in contact with significant others are reflections of social compatibility. Furthermore, a personality configuration in which one is neither high nor low on extraversion may also be important in terms of effective performance in isolated conditions while either alone or with just a few others. It is interesting that Ursin, Comet, and Soulez-Lariviere (1992) speculated about optimal personality characteristics of space crew members on a long-duration mission and also pointed to the factor of extraversion; in their formulation, low-medium extraversion was considered ideal.

While generalizations from a single case example need to be made with caution, C.’s overall personality trait configuration reflecting low neuroticism and a balance in positive characteristics, boldness in the absence of emotional and behavioral dysregulation, and the ability to become engrossed in the beauty of the environment one is isolated in may be more important in

successful accomplishment and resilience in facing challenging conditions than specifying particular traits within this configuration. Personal values associated with autonomy, self-determination, and a feeling of oneness with others and the world also may be significant factors related to successful pursuits in ICE environments. Thus, the “right stuff” personality features for optimal performance in either solo or group settings may center basically on the same “stuff,” that is, a normal range personality profile. Within this configuration, the kinds of characteristics Gunderson identified as the adaptive triad for effective performance may ensue.

Finally, it should be noted that technological advances have changed the ICE experience, including the sailing environment. The commonly noted sleep deprivation and associated errors reported by solo sailors have been lessened through the use of self-steering apparatus that allows the sailor to sleep. In addition, while environmental isolation exists, the availability of communication with others through various electronic media has also resulted in a changed experience; both social and technical support from others are possible through satellite phone and email. Perhaps contact with others through these means has lessened the sensed presence experiences that may be a combination of sensory isolation, sleep deprivation, and physical and emotional stress.

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