

Positive growth and change of personal values in solo unsupported and unassisted expedition to the South Pole A case study

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The present case study assessed stability of personal values and post-return positive growth experiences of a 36-year-old Croatian male who successfully completed a 47-days solo unsupported and unassisted expedition to the South Pole. PVQ was administered at three time points, while PTGI was administered at two time points to measure possible changes in personal values and personal growth over time as a result of participating in the polar expedition. Personal values of Universalism and Self-Direction were the highest rated over the course of the expedition; significant increase in the Benevolence value, and decrease in the Tradition and Conformity values was noted in post-expedition and 6-month follow-up period. As a result of participating in the polar expedition, perceptions of considerable positive growth were found over time, as well as endorsements of positive experiences.

KEY WORDS: Antarctica, Extreme environment, Polar expedition, Personal values, Positive growth.

Introduction

Antarctica is the coldest, darkest, windiest, and driest area with the highest average altitude on the planet (Zimmer, Cabral, Borges, Côco, & Hameister, 2013). Geographically remote, Antarctica has no permanent residents, and is considered the most hostile region for people on Earth (Sandal, van deVijver, & Smith, 2018). These characteristics define Antarctica as one of the few places on Earth that allow the investigation of psychological adaptation to extreme environmental conditions in humans (Tortello et al., 2018).

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Previous studies of psychological adaptations to polar environments have been criticized for emphasizing the negative features of the experience resulting from exposure to environmental stressors and long periods of isolation and confinement (Leon, Sandal, Fink, & Ciofani, 2011). Thus, there is an increasing trend in polar research that highlights the salutogenic (Antonovsky, 1987) and positive effects of such experiences resulting from successfully coping with stressors (Blight & Norris, 2018; Norris, Paton, & Ayton, 2010; Smith, Kinnafick, Cooley, & Sandal, 2017a; Zimmer et al., 2013). These studies suggest that salutogenic experiences are related to a heightened self-efficacy, increased self-values, achievement, depth of insight, improved relations with others, improved health, and personal growth (Sagar & Pattanayak, 2015). Better understanding and promotion of salutogenic effects is of high importance for mission planning.

Significant personal experiences, in this case the polar expedition experience, can change an individual's value system (Blackadder-Weinstein, Leon, Norris, Venables, & Smith, 2019). Values are defined as desirable, trans-situational motivational goals of varying importance, which serve as guiding principles for action (Sandal, Bye, & van de Vijver, 2011). Recent research on individuals and groups after completion of their missions in extreme conditions, including space and polar environments, revealed a change in personal values, namely in Self-Direction, Universalism, Spirituality, and Power (social recognition) (Kjærgaard, Leon, Venables, & Fink, 2013; Suedfeld, Legkaia, & Brcic, 2010).

A growing body of evidence suggests that exposure to stressors associated with extreme environments may result in personal growth (Smith et al., 2017a; Linley & Joseph, 2004). Tedeschi and Calhoun (2004; 1996) introduced the concept of post-traumatic growth to represent positive psychological transformation in the aftermath of a challenging life experience, and developed the Post-Traumatic Growth Inventory, the most commonly used measure of post-traumatic growth. Findings indicate that cognitive and behavioural adaptations, proposed to explain Post Traumatic Growth following a highly stressful or traumatic event, can also be applied to explain personal growth in individuals who have endured self-imposed extreme journeys such as an extreme polar expedition (Smith, Kinnafick, & Saunders, 2017b). Many studies of extreme and unusual environments have documented that expedition participants reported an increased sense of personal strength, positive spiritual change, increased appreciation for life, and feeling more capable of overcoming future challenges after their return (Smith, et al., 2017a; Suedfeld, 2001).

The aim of the present study was to assess possible changes in personal values during the course of the expedition, post-return personal growth, and

the stability of these changes over time in the first Croatian solo unsupported and unassisted expedition to the South Pole.

Method

PARTICIPANT

One man took part in the South Pole expedition, Davor, age 36 years, who is freelance photographer, writer and adventurer by profession. Davor trained for this expedition for two years and his preparations included expeditions to northern Siberia, northern Greenland, Svalbard and Norway, where he learned how to manage cold and extreme environment from traditional Arctic dwellers such as the Inuit, Nenets and Sami people. Davor successfully completed a number of projects and expeditions, including aerial chronicles of Croatia, which were published in cooperation with National Geographic as photo-monograph, trekking expeditions in Bhutan and Bolivian Amazonia, motorcycle expeditions across many countries, and others. To date, he has published 7 books about his projects and expeditions. While completing the South Pole expedition, Davor carried a satellite-tracking beacon to monitor his progress, specifically time, distance covered, and altitude. He also carried two satellite phones each with its own SIM card and a solar charging system to communicate with his team. The study conforms to the principles outlined in the Declaration of Helsinki, and a written consent form was obtained from participant prior to commencing the current research.

MEASURES

Portrait Values Questionnaire (PVQ; Schwartz, 1994; Schwartz et al., 2001; Lindeman & Verkasalo, 2005). A 40-item measure based on the 10 domains of Values Theory that includes short verbal descriptions of 40 different people, gender matched with the respondent, who endorse certain values. Each portrait describes a person's goals, aspirations, or wishes that point implicitly to the importance of a value. PVQ showed satisfactory internal consistency ranging from .61 (Tradition) to .83 (Achievement) (Caprara, Schwartz, Capanna, Vecchione, & Barbaranelli, 2006). Test-retest reliabilities ranged from .66 to .84 across scales; the discriminant validity of the 10 PVQ values was demonstrated by studies in numerous countries (Schwartz et al., 2001; Leon et al., 2011).

Posttraumatic Growth Inventory (PTGI; Tedeschi & Calhoun, 1996). A 21-item measure developed to assess positive outcomes following the experience of traumatic or life-altering event. Internal consistency for the total score and subscales of the PTGI has been reported as satisfactory (α coefficient for the total scale = .90, Relating to Others = .85, New Possibilities = .84, Personal Strength = .72, Spiritual Change = .85, and Appreciation of Life = .67), and the test-retest reliability (.71) over 2 months has also been reported (Tedeschi & Calhoun, 1996).

General Questionnaire. A demographics questionnaire was used to assess sex, age, race, ethnicity, income, relationship status, educational status and current occupational status.

Health History Questionnaire. A 6-part comprehensive self-administered health history questionnaire was used to collect important information about participant's current health status, personal health history, health habits and personal safety, family health history, surgery, mental health, and medication use prior to expedition.

Post-Expedition / 6-month Follow-Up Debrief Interview. Interviews were conducted at two-time points. The first interview was completed approximately three weeks post-expedition, and was designed to obtain more comprehensive information and detailed insight about the participant overall perspective, personal history, personal values, preparation for the expedition, challenges encountered during the expedition, coping strategies utilized in managing

challenges, appraisal of challenges, and lessons learned from expedition experiences. The second interview was conducted 6 months post-expedition to assess changes since the end of the expedition, specifically possible changes in personal values and potential for personal growth, and to explore some of the emergent themes taken from the initial interview in greater depth. Each interview lasted for 60 minutes.

PROCEDURE

General Questionnaire, Health History Questionnaire, and PVQ were administered four weeks pre-expedition at a time and place agreed with the researcher. Researcher checked immediately if all items on each test were completed, so there was no missing data. Shortly upon his return from the expedition first debrief interview was conducted, and participant completed PVQ and PTGI. Second debrief interview was conducted at the 6-month follow up, and PVQ and PTGI were administered. Over the course of the expedition, participant completed open-ended expedition diary and shared voluntarily parts of these records with researcher to aid recall during the post-expedition and follow-up interviews. Participant did not receive any compensation for his participation. Data were collected between December 2017 and August 2018.

Expedition Details

The goal of this expedition was to be the first person from Croatia to reach the South Pole without outside support. Davor wanted to undertake the expedition to one of the remotest and most desolate parts of the world ever since he started travelling around the globe. Throughout the two-year intense mental and physical preparation period, Davor was also raising funds to finance the expedition. Apart from private and public funding, the remaining sum was gathered successfully through the crowdfunding campaign.

Davor was flown by plane from Punta Arenas in Chile to Union Glacier Camp (altitude 700 m), the only private seasonally occupied campsite located in Ellsworth Land in Antarctica, and operated by Antarctic Logistics & Expeditions LLC (ALE), a company that provides expedition support and tours to the interior of Antarctica. From the Base Camp, Davor was transported by Twin Otter ski plane to Hercules Inlet (altitude 767 m) on the coast of the Antarctica. The expedition lasted for 47 days, during which Davor crossed 1163 km alone, unsupported and unassisted, from Hercules Inlet to the South Pole checkpoint. His expedition route, tracked via Global Positioning System (GPS) is shown on Image 1. Davor was dragging all the equipment and stock he needed on a sled weighing 135 kg at the start of the polar expedition. On daily average, explorer was walking on skis between ten and twelve hours at a pace of 30 kilometres per day. Occasionally, he would take a break, which cumulatively took three days of expedition (Day 14, 27 and 39). The temperatures were usually between -15 and -27 degrees Celsius. However, due to wind chill, an effect that changes perception of the temperature, explorer was periodically exposed to temperature of -50 degrees Celsius.

The most significant environmental stressors were severely low temperatures, whiteouts, wind, and low stimulation. Due to the constant cold wind, on Day 18 Davor developed a condition called polar thigh. Frequently seen in skiers in polar environments, polar thigh is defined as a form of mechanical abrasion or chilblains on the thighs caused by severe cold and friction between multiple layers of clothes, which can swiftly become blisters and then large open wounds if left untreated. Davor treated the itchy red lesions on his thigh with topical corticosteroid cream, and managed to keep the injury under control until the end of expedition. In the first week of the expedition inability to consume planned daily meal amount has occurred, accompanied by the pharyngeal reflex. The calorie consumption throughout the expedition was on average 5,121 cal (max 6400 cal, min 3,100 cal), and destination was reached with only 0,5 kg of food supply left. The unique physical demands associated

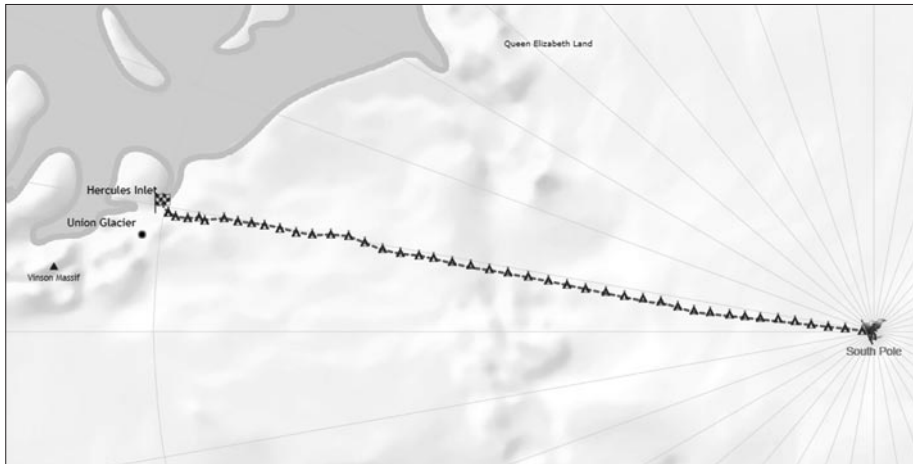


Fig. 1. - Expedition route tracked via Global Positioning system (GPS) from Hercules Inlet to the South Pole.

with polar expedition also resulted in significant weight loss (-16 kg compared to the initial measurement). The most prominent psychological stressor was fear of injury. Other personal challenges included isolation, fatigue, monotony, longing for family and friends, and reduced attention capacity.

Last week of the expedition was especially challenging because of the inclement weather, including strong headwind and bitter cold wind chill, and feelings of physical and mental tiredness. After he reached the South Pole on Day 47, Davor was picked up by a helicopter and flown to Union Glacier Camp, and then flown by the plane to Punta Arenas in Chile.

Results

GENERAL HEALTH

Review of Davor's past health history showed that he was in excellent physical and mental health. He consumed alcohol occasionally, and did not smoke. There was no family history of common chronic diseases. Before and after the expedition he did not complain about any ordinary health problem.

PERSONAL VALUES

Davor's PVQ results were compared to assess personal value hierarchy before the start of the expedition, and potential change in values hierarchy over time as a result of the expedition experience. His pre-expedition PVQ

values hierarchy indicated that Davor attributed highest importance to Universalism and Self-Direction. This profile configuration indicates that tolerance and appreciation of all living beings, as well as mastery, autonomy, and independence were highly important to him (Schwartz, 2012). In terms of motivational goals, Universalism and Self-Direction both express reliance upon one's own judgment and comfort with the diversity of the existence. Davor attributed least importance to Tradition, Power, Security, and Hedonism, which indicates that conventional values, social status and prestige, avoidance of challenges, and self-indulgence were of low importance.

The post-expedition and follow-up assessments showed that the most pronounced change was an increase in the Benevolence value, which indicated that Davor started to give more importance to interpersonal relationships as a result of the expedition experience. He showed an increase in the ranking of the Universalism from the post-expedition to the follow-up, that suggests a change over time related to importance placed on inner harmony, concern for the welfare of others, and protection of nature. Over the same time period, there was a decrease in the Self-Direction value, which might indicate his readiness to let go of his need to control. There was a pronounced decrease in the post-expedition and follow-up periods in the Conformity value, suggesting that Davor attributed less importance to fulfilling social expectations over time as a result of the expedition experience. Furthermore, in the follow-up period he placed even less importance to the Tradition value compared to post-expedition period. Changes in Portrait Value Questionnaire scores from pre- and post-expedition to follow-up period are presented in Figure 1.

POSITIVE GROWTH

Comparison of Davor's post-expedition and 6-month follow-up PTGI scale scores indicated that he experienced significant personal growth, which is in accordance with presumed salutogenic (or health-enhancing) function of challenging experiences (Antonovsky, 1987). His scores increased on three of the five PTGI scales at the 6-month follow-up, specifically Relating to Others, New Possibilities, and Appreciation of Life. While the score on Spiritual Change remained the same, Davor's score on Personal Strength was lower at the follow-up. The PTGI ratings are presented in Table I.

INTERVIEW MATERIAL

Despite all the challenges, Davor described his expedition experience as exceptionally rewarding and transformational in both post-expedition and 6-

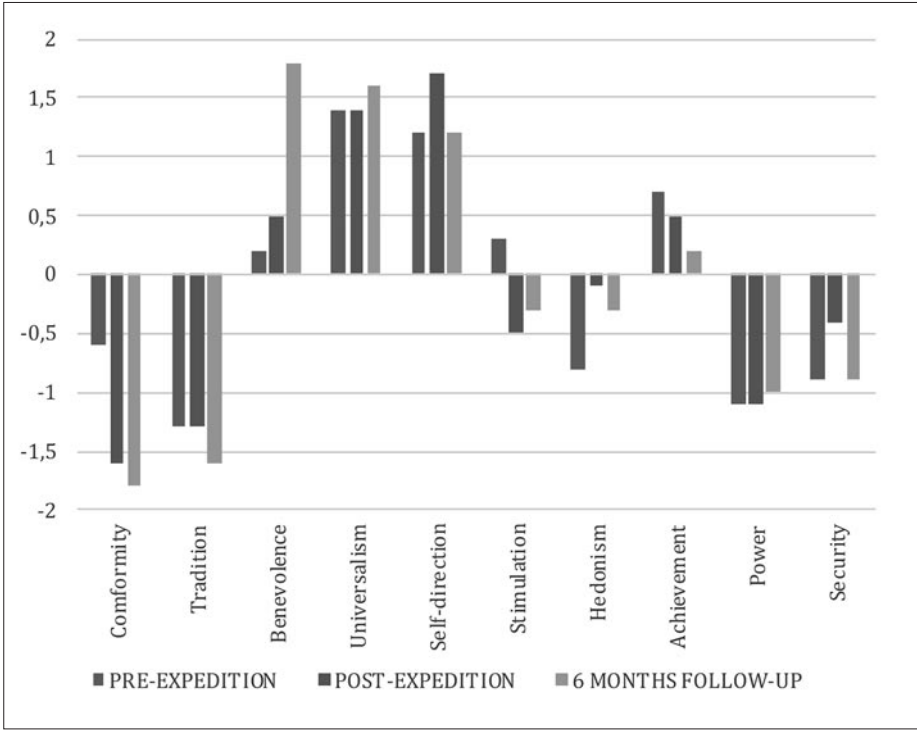


Fig. 1. - Changes in Portrait Value Questionnaire scores from pre- and post-expedition to follow-up period.

Note: 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 within-person 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. PVQ = Portrait Values Questionnaire

month follow-up interview. He emphasized that detailed and thorough pre-expedition preparation played an incredible part in the success of his venture along with developing good mental and physical strength, and establishing realistic expectations of environmental conditions.

Davor identified a number of daily routines that helped him to manage environmental conditions and dealing with day-to-day challenges, such as preparing breakfast, packing the gear before the day journey, writing expedition journal, preparing status update reports, and communicating with his family and support team in the evening. Regardless of the extended periods of light during summer season (i.e. midnight sun), he followed a 24-hour schedule. In the first days of expedition, before he established the strict daily

TABLE I.
PTGI Mean Scores

Scores	Post-expedition	6-month follow-up
Relating to others	2.4	3
New possibilities	2	2.6
Personal strength	4.25	4
Spiritual change	4	4
Appreciation of life	4	4.3

Note: Items were rated on a 6-point scale from 1 = *I did not experience a change as a result of my involvement in the expedition* to 6 = *I experienced this change to a very great degree as a result of my involvement in the expedition*.

PTGI = Posttraumatic Growth Inventory.

schedule, he complained about lack of sleep, and bouts of worry, usually in the morning, which he called “morning demons”.

When reflecting on the expedition itself, Davor accentuated managing fears and solitude as the most difficult personal challenges he had faced in Antarctica. He indicated, “I’ve spent a fair bit of time alone on my previous ventures, but nothing of this extended nature. This mindset of being completely alone in an immense space started getting to me, and every emotion became very intense and often overwhelming. Like I am surrounded with giant mirrors that enhance hundred-fold everything I feel.” In terms of coping with solitude and monotony of the landscape, the explorer noted that meditation/mindfulness techniques helped him to stay in the present, along with other coping strategies he employed. In his expedition journal, he also mentioned the period of conflicting thoughts, which mostly focused on his hope to be financially retributed for his efforts and publicly recognized after he successfully reaches his goal. These thoughts were opposite of his personal core values, and accompanied by an overwhelming feeling of shame. On Day 13 he experienced the flow state for the first time. Davor recalled, “I was completely immersed in the activity; I was so focused on the present that I lost track of the time passing; my Ego fell away, and my whole being was involved. I felt utterly serene; I used my skills to the utmost.” He pointed out that, “being present and focused on ice of Antarctica is not easy as it may seem.” Davor reported that from Day 13 until the Day 47, when his challenging journey was successfully completed, he would experience the flow state on a daily basis. Time intervals that he spent in the flow state varied, and on some days, he managed to achieve and be in the flow state for a couple of hours.

His most significant psychological slip occurred on Day 18 when he developed polar thigh. From that day until the middle of the expedition he was struggling to control his thoughts and emotions.

The moment of achieving expedition goal Davor described as “feeling of positive emptiness”. The whole expedition experience made him understand the value of what he has now, and clarify his goals in life. Davor noted, “I felt transformed, like I am just starting to live more fulfilling and less egocentric life; focused on needs of other people, being a team player. I made so many important decisions for my personal and professional future. Last, but not the least, I asked my girlfriend to marry me, and she said yes.”

Discussion

The aim of the present study was to examine changes in personal values during the course of the unsupported and unassisted solo expedition to the South Pole, post-return personal growth, and the stability of these changes over time. The findings demonstrated considerable changes in explorer’s personal values following the successful completion of the expedition and positive post-return personal growth.

Researchers who study extreme environments often overlook positive psychology aspects. While it is undeniable that polar expeditions come with certain problems and challenges, beneficial aspects of experiencing such an environment do exist as well (Suedfeld, 2001; Leon et al., 2011). Many explorers experience positive or so-called salutogenic outcomes (Antonovsky, 1987) resulting from successful adaptation to polar environments, and report feelings of personal growth, enhanced self-sufficiency, and improvements in health (Sandal et al, 2018;).

Studies of personal and social values of different types of expedition teams showed consistency across groups in designating high valuation of self-direction, stimulation, universalism, and benevolence (Blackadder-Weinstein et al., 2019). Davor was similar to other polar explorers in their high valuation of Universalism and Self-Direction, and low valuation of Tradition and Power (Smith, Sandal, Leon, & Kjærgaard, 2017c). The assessment of possible changes in values pre- to post-expedition indicated a significant increase in Benevolence, which reflects greater importance given to interpersonal relationships, especially relations within the family and with significant other. Increase in the ranking of the Universalism from the post-expedition to the follow-up suggests a change over time related to importance placed on inner harmony, concern for the welfare of others, and protection of nature. Over the same time period, there was a decrease in Self-Direction value, which might indicate Davor’s lesser need for autonomy. There was a pronounced decrease in the post-expedition and follow-up periods in the Conformity value, as well as further decline in Tradition value, which indicates that

Davor attributed less importance to fulfilling socially imposed expectations and following rules and procedures.

Davor's PTGI scores indicated considerable changes in personal growth over time, as a result of participating in the polar expedition. From the post-expedition to the 6-month follow-up period, Davor exhibited an increase in personal growth reflected by positive changes on Relating to Others, New Possibilities, and Appreciation of Life. His score on Personal Strength was lower at the follow-up, while the score on Spiritual Change remained the same. Similar PTGI findings that indicated salutogenesis (Antonovsky, 1987), characterised by perceptions of considerable personal growth through participating in extreme environment expeditions, were reported in other studies (Suedfeld, Brcic, Johnson & Gushin, 2012; Kjærgaard et al., 2013; Palinkas and Suedfeld, 2008).

The qualitative data obtained from current study suggest that the solo explorer was quite resilient in extreme situations, managed to control his anxiety and fears, and was relying successfully on his internal resources and capabilities in situations of threat (Domuschieva-Rogleva & Iancheva, 2017). Better understanding of explorer's post-expedition re-adaptation might provide useful information to future extreme environment expeditions, including long-duration space voyages (Lloyd & Apter, 2006). Another component of Davor's success was his self-awareness and ability to act upon it throughout the expedition, which emphasize the importance of harnessing the mind in a positive way. Application of these results might be useful in selection, training, monitoring and support of individuals who plan to operate in extreme environments, professional athletes, as well as for researchers interested in investigating psychological adaptation to extreme conditions.

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