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Editorial: Social relevance of polar research: Part 1

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Polar research encompasses a broad spectrum of scientific investigations, including environmental studies, climate change research, biodiversity conservation, psychology, human geography, indigenous studies, anthropology, political science, sustainable tourism development, and more. While the natural aspects of polar research have received significant attention, this special issue of *Polish Polar Research* entitled *Social Relevance of Polar Research* seeks to bridge the gap and shed light on the broader societal implications of this critical field.

The first part of the special issue begins by reflecting on what motivates people to work in the polar regions (Walotek *et al.* 2024). There are dozens of year-round polar stations in the Arctic and Antarctica (Palinkas and Suedfeld 2008), creating jobs for several thousand people yearly (Davies 2022). Working conditions in polar stations are referred to as ICE – isolated, confined, extreme, recognizing that they pose above-average challenges to human adaptation (Sandal *et al*. 2006). Hence, a legitimate question arises: why do people want to expose themselves to such conditions? A study by Walotek *et al*. (2024) shows that winterers are primarily motivated by the desire for challenge and adventure, the need for unique experience and job performance. Differences in motivation can be observed between people from different countries, between men and women, wintering to varying types of polar stations – Arctic and Antarctic, civilian and military.

The following two articles delve deeper into who participates in polar expeditions. Researchers have so far considered various characteristics that may affect adaptation to extreme conditions, such as personality and temperament, stress resistance, and mental health status (Palinkas 2003; Sandal *et al.* 2006; Leon *et al.* 2011; Johnsen and Gjeldnes 2023). The articles by Skorupa *et al.* (2024) and Kokun and Bukhmatov (2024) focus specifically on personality. According to Skorupa *et al.* (2024), an analysis of personality tests of work candidates at the Polish Polar Station Hornsund in Spitsbergen from 2019 to 2023 reveals significant differences from the general population. As expected, candidates applying for work in the polar station scored significantly lower in neuroticism and higher in conscientiousness than the general population. Other significant differences included lower extroversion and surprisingly, lower openness to experience than the general population.

For polar expeditioners, working in a polar station can be a constructive experience. As shown by Kokun and Bukhmatov (2024), participants in expeditions to the Ukrainian Antarctic *Akademik Vernadsky* station experienced various aspects of personal growth following participation in Antarctic expedition. Moreover, personality traits, such as extraversion, may allow the prognosis of post-expedition growth. Alongside personality traits, professional hardiness appears to be the most important predictor for post-expedition growth, influencing primarily the quality of relations to others and appreciation of life.

The traits associated with adaptation to work in a polar station extend beyond personality. One fundamental individual difference, which arouses much debate in the context of polar exploration, is gender. Bożek *et al.* (2024) explored the beginnings of women participation in polar expeditions and how large a group of polar explorers they are today. The first Polish woman to visit Antarctica was Alina Centkiewicz, who participated in an expedition to East Antarctica with her husband in 1958–1959 (Cisak 2015; Bożek 2021). In 1958, Zofia Michalska took part in a Polish expedition to the Arctic, becoming the first woman from Poland to do so (Siedlecki 1964). Women also visited polar stations almost from the beginning of their establishment in the 1970s and 1980s. However, it was only in the second decade of the 21st century that female participation in year-round expeditions significantly increased (Bożek *at al.* 2024). Women are now as valuable members of polar expeditions as men, making essential contribution to the operation of polar stations.

Despite the numerous physical and mental challenges of human presence in the polar regions (Sandal *et al.* 2006), this activity carries a very high value for society. As argued in the final article of the special issue by Goździk (2024), the polar regions capture attention and thus effectively engage the general public in the discussion of climate change. As some of the most fascinating natural environments, polar regions have the power to engage pupils in topics related to nature in general and the global change in particular (Macario *et al*. 2013). The difficulties in reaching regions such as the Arctic add to their allure (Goździk

2017). Goździk (2024) discusses educational projects such as EDUSCIENCE, EDU-ARCTIC, EDU-ARCTIC 2, and INTERACT, implemented, among others, by the Institute of Geophysics PAS. The educational activities within those projects have a very high impact. For example, teachers of students aged 13–20, participating in the EDU-ARCTIC program between 2016 and 2019, reported significant increases in all aspects of learning outcomes, including knowledge about nature, geography, natural resources and climate change in polar regions, as well as sensitivity to environmental issues concerning these regions.

By adopting a broader approach to studying polar regions, this special issue explores the multifaceted dimensions of polar research in relation to individuals and society. It highlights the significance, implications, and potential contributions of polar research to addressing social challenges in the polar regions and beyond.

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