Teamwork in Antarctica

Research Report

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Content

1. About the project

Summary

Project title

Team Adaptation during Antarctica Summer Campaigns (ADaT – PROPOLAR 2019/2020; NTR Grant nº 19 2019)

Background and objectives

Antarctica is the harshest continent on the planet and presents unique challenges to human collaboration. Since 2016, our team has applied diverse theoretical and methodological perspectives to learn how Antarctica science teams engage in various forms of teamwork to achieve performance goals.

We have found that Antarctica science teams face daily challenges that threaten mission success and one of the most important predictors of good performance is team adaptation. Team adaptation is defined as the adjustments teams make when faced with emergent contextual changes (e.g. weather change). While most of the data that we have collected comes from Antarctica science teams, our findings suggest that we also need to consider other teams with whom these teams interact in order to understand the full picture of team adaptation in Antarctica.

> ***"One of the most important predictors of good performance is team adaptation; the adjustments teams make when faced with emergent contextual changes (e.g. weather change)"***

Thus, we gathered additional data concerning the views and experience of managers and logistic team members, who (a) support Antarctica science teams, (b) connect to multiple science teams and (c) provide key resources that these teams need. We have several aims: to gain insights into the unique perspectives of Antarctica teams; to clarify the dynamics of science teams as well as logistic team adaptation in Antarctica, and to present practical recommendations that can assist in the design and implementation of effective teamwork under extreme conditions.

Research Team

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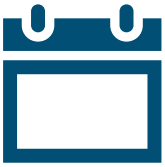
2. Methods

Procedure

Study performed at King George Island, Antarctica



Data collected from
January 30. to February 13. 2020

Participants included scientists, staff and managers

15 minute self-reported survey completed with an iPad or paper pencil version. We assessed[1]:

- The challenges teams faced
- How teams adapted to the challenges
- Team members ratings of how effective they dealt with the challenges

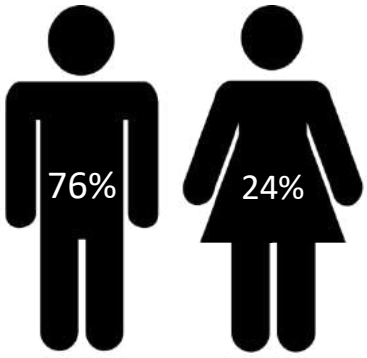
[1] Participants were asked to: (1) order challenges by order of severity, i.e., how much the events threatened team performance; (2) to what extent they agreed that their team changed the way they behaved to deal with challenges, using a Likert-type scale ranging from 1 (Totally disagree) to 5 (Totally agree); and to rate their performance solving challenges, using a Likert-type scale ranging from 1 (Not effective at all) to 5 (Totally effective).

3. Results

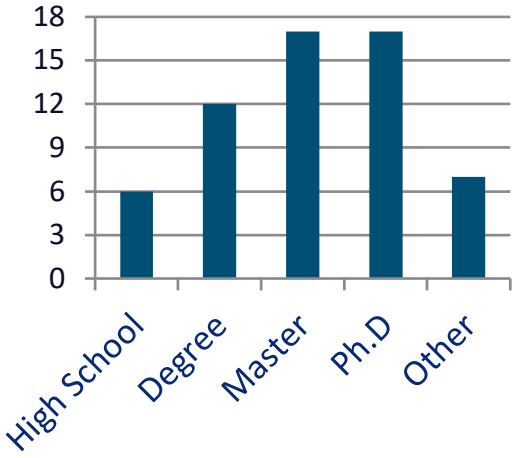
Demographics

Participants: 60

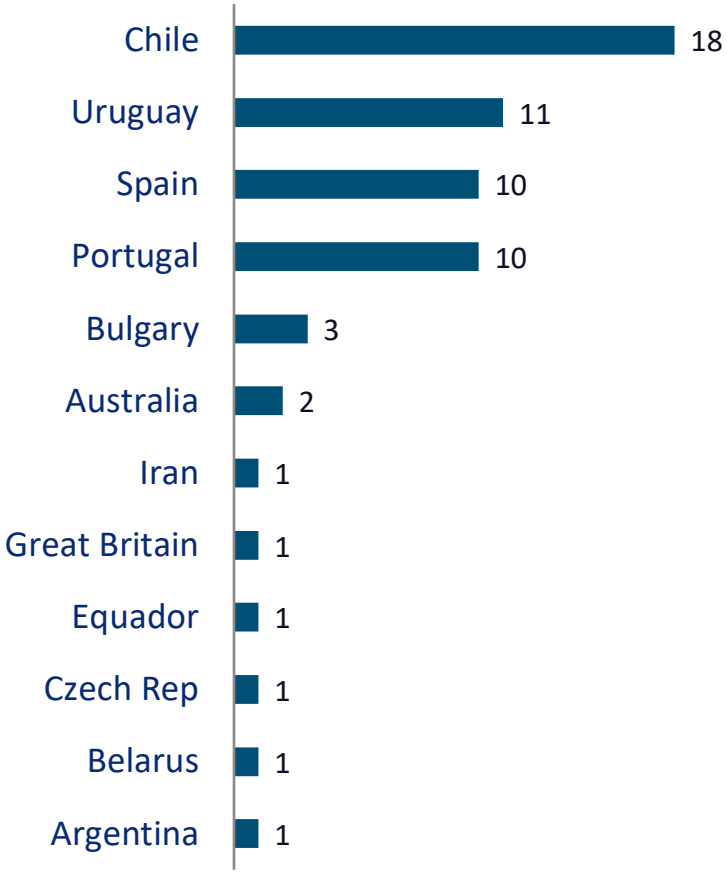
Mean Age: 44 years (*SD*=13)



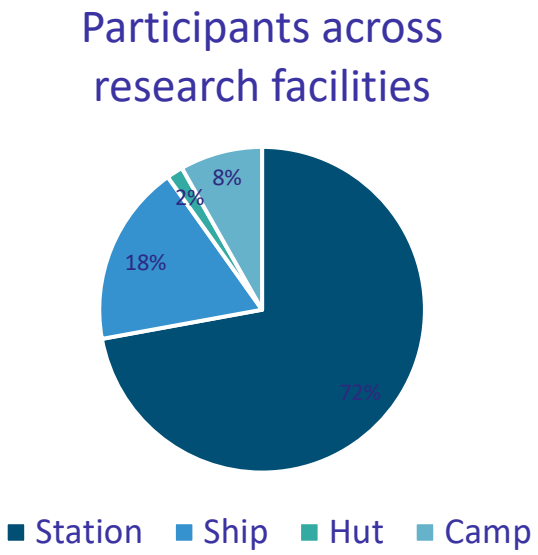
Education level

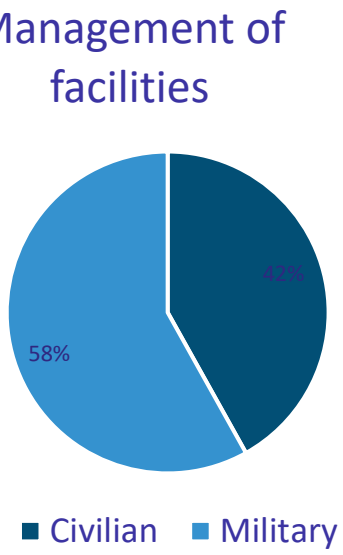


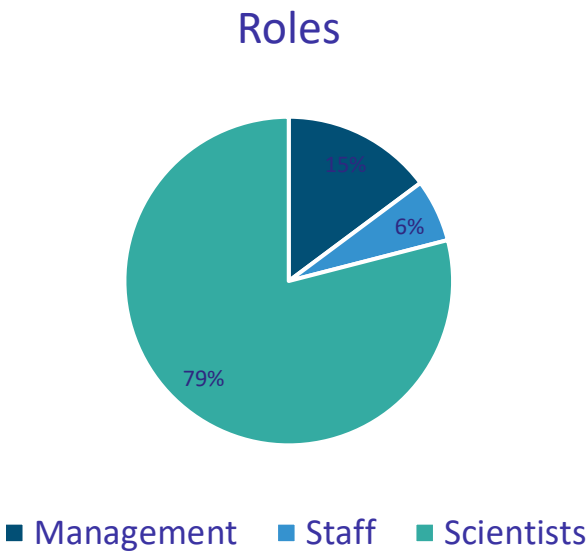
Nationalities



Demographics

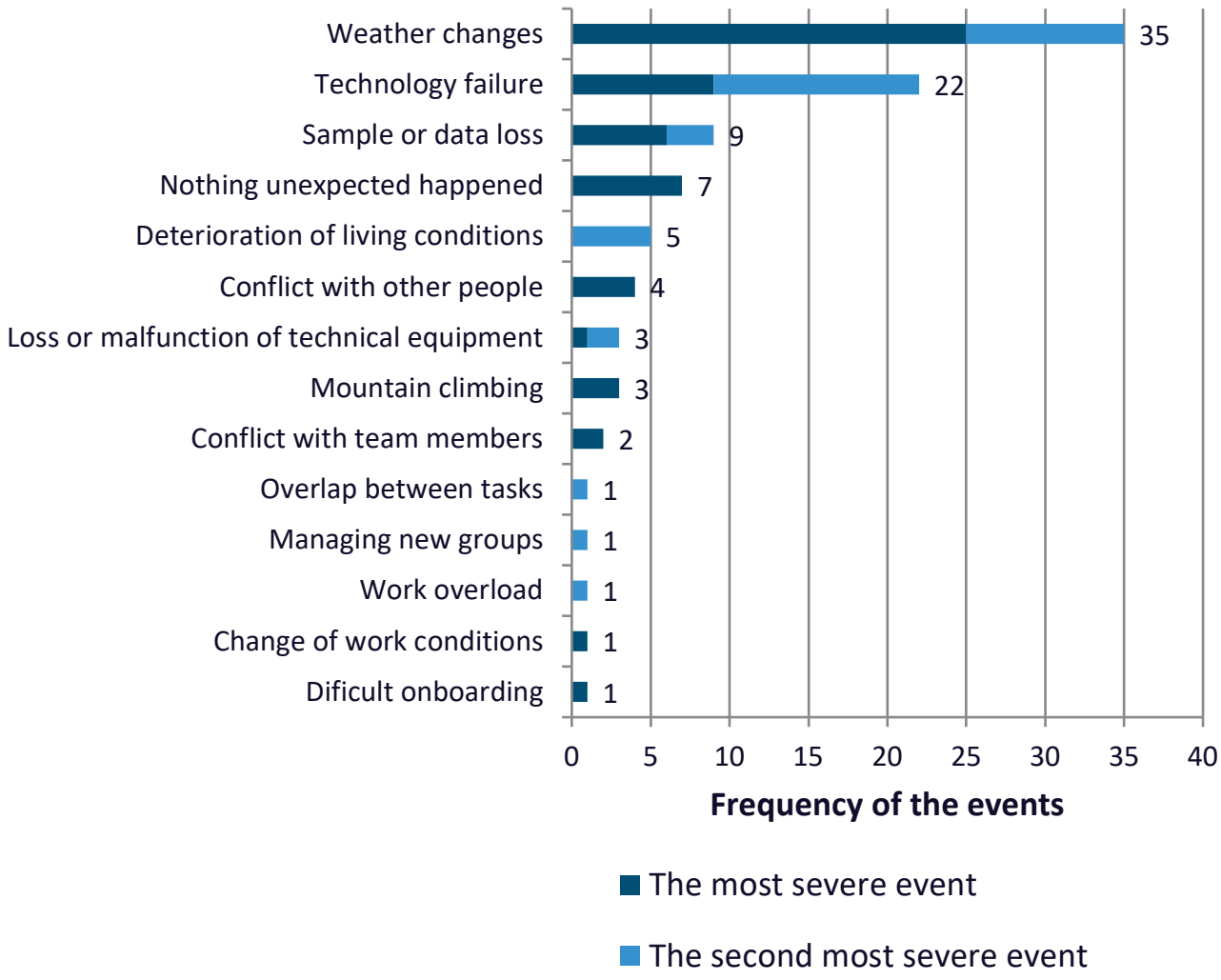






4. Results

What were the two most severe challenges you faced with your team in the last week?



"Weather changes and technology failures were the two most common challenges that teams faced and had to adapt to."

What do our participants say about the challenges they faced?

Since most field studies depend highly on weather conditions this was the most common challenge and reason why teams had to adapt their plans. This challenge is often anticipated, especially by experienced researchers. They often think about contingency plans before the mission because they are aware that weather conditions might allow only very few field days.

> ***"It's always the weather, so we have to adapt every time. (…), the weather will be good, we can go to the field (…), when we get there, the weather is horrible. We have to wait"***

The second most frequent challenge that teams faced were complications with equipment (break or loss of equipment). In some campaigns, this lead to a mayor delay of the project but other teams adapted by finding replacements for their broken equipment on the station or other stations. In some cases teams even improvised and built new equipment with parts that were lying around at the station.

> ***"I waited one week for my equipment and that was not part of the plan (…) and they could not find my things so it was stressful".***

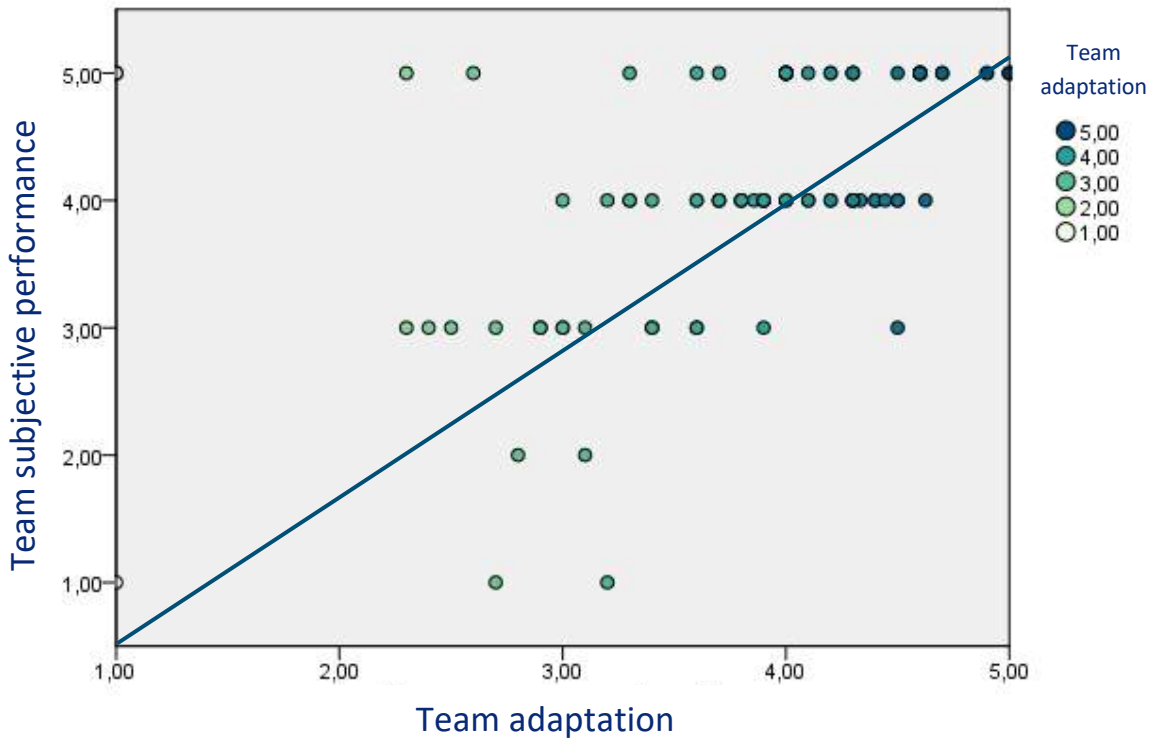
Some teams faced severe threats from the nature or animals, especially divers often put themselves in danger when the sea conditions change rapidly or unexpectedly animals become a threat to divers. In these situations teams have to rapidly adapt in the moment to solve the problem.

> ***"Three divers went down and at the moment they threw themselves [into the water] a leopard seal appeared (…) unfortunately the seal began to surround them from above and did not let them leave immediately."***

These three quotes illustrate extreme situations that Antarctica teams face. In order to be successful the teams need to quickly assess the situation, be flexible, adapt and find a solution. This happens either in the moment if sudden changes occur or they anticipate changes beforehand and already have contingency plans in place.

Adaptation of teamwork processes

Team adaptation is positively related with team subjective performance. The more team members reported that they changed their behaviour to respond to challenges, the more successful they were in solving those challenges.



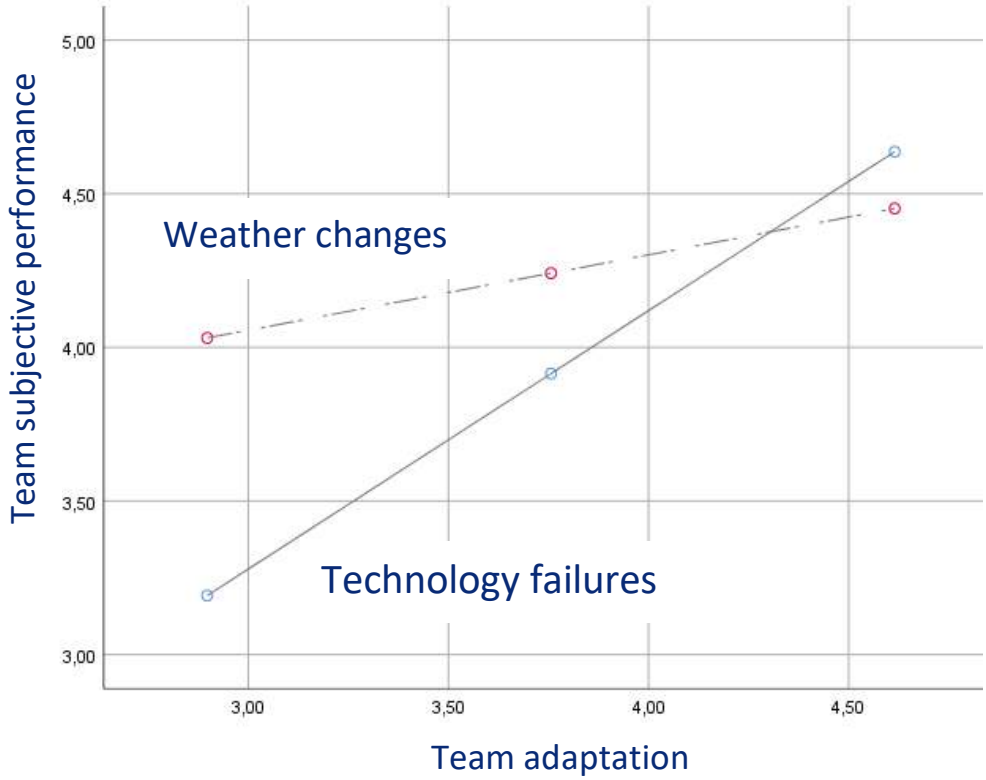
Teams can adapt different teamwork processes depending on the challenge. We distinguish three teamwork processes: *a)* **action processes** *b)* **transition processes** and *c)* **interpersonal processes**. ***Action processes*** include teamwork during a field trip for example coordinating actions, offering and asking for support, or monitoring the work. ***Transition processes*** include everything that happens before or after a field trip like planning, defining strategies, goals and roles or reflection. ***Interpersonal processes*** concern the team itself and includes managing conflicts, building motivation and creating a positive mood.

A team can and needs to change the three teamwork processes depending on the challenge. Our data suggest that the adaptation of ***Interpersonal processes*** is strongest related with performance.

Adaptation to different challenges

Team adaptation to challenges such as technology failures or equipment malfunction happens mainly through changes in ***interpersonal processes***.

Team adaptation to challenges happens through adaptation of all three teamwork processes (i.e. ***action, transition and interpersonal processes***). Our data also suggests that adaptation of ***interpersonal processes*** is stronger related with performance during challenges like technology failures in contrast to weather changes. (See figure below)



"The best way to deal with technology failures is to focus on interpersonal processes. During weather changes it is beneficial to adapt all teamwork processes"

What do our participants say about what helps them solving the challenges they faced?

Antarctica is not only characterized by a unique environment with it's stunning nature and landscape but also with it's unique social environment. Teams are confined and isolated on stations and generally resources are scarce. This fact increases the importance of a good social network that can act as additional resources to solve challenges.

> ***"Collaborating with others (…) is fundamental. And I think we know that without this collaboration we could not do things (…) that spirit of collaboration is very much rooted in people going to Antarctica".***

Building a good network is crucial. In case of equipment malfunction other research teams might be able to share their equipment. Skilled logistic staff might be able to improvise, repair and build new equipment. Succesful teamwork in Antarctica is very much rooted in mutual support. This support becomes better and more effective with better social relationships.

> ***"You need a network here, to do the job well (…). Several small groups, working together, who share certain tasks. Then there is the station staff, doctors, and military etc. that support us".***

Formal (e.g. briefings) and informal (e.g. dinner, sports) interactions with other researchers and staff are important to establish good relationships and build a support network that will help to deal with challenges.

> ***"My equipment was broken. The base technicians help us to solve the problem. (…) if no one can solve it they contact the base that is next to ours and try to solve the problem, it always works (…)."***

In order to be successful Antarctica teams need to collaborate and use their network to adapt and find solutions.

4. Recommendations

"Successful campaigns are possible if teams adapt to the unexpected challenges that arise during their missions."

How can individuals and teams increase their adaptation and performance?

- Plan in advance as much as possible before the campaign. Also, think about a "Plan B", "C" and "D" if something might go wrong. Once in Antarctica, be open to revise and update your plan on a daily basis or after any unexpected challenge.
- Build strong and meaningful relationships with your team members. Once in Antarctica make sure you do the same with other people (e.g. scientists, staff, and managers). This network will help you dealing with challenges.
- Be mindful of your fellow team member's needs; be willing to support them in the tasks they have to do or the problems they may be dealing with. Simple questions like *"How are you today?"* or *"How can I support you"* can make a big difference.
- Be open to change the way you work and how you work if that is not the best way to solve an unexpected challenge.

How can managers and polar programs enable team adaptation?

- Make teams aware of challenges and encourage them to anticipate potential solutions before the mission.
- Train people to learn how to communicate and reflect better collectively in order to improve how well they respond to the challenges that happen or are anticipated.
- Implement and encourage station routines that enable effective work (e.g. daily briefing and debriefings) and social (e.g. celebrations, games) interactions between people in order to build a network.

5. Further readings

Recommended Books

Edmondson, A. C. (2012). ***Teaming: How organizations learn, innovate, and compete in the knowledge economy***. John Wiley & Sons.

Edmondson, A. C., & Harvey, J. F. (2017). ***Extreme teaming: Lessons in complex, cross-sector leadership***. Emerald Group Publishing.

Scientific Literature

Golden, S. J., Chang, C. H., & Kozlowski, S. W. (2018). ***Teams in isolated, confined, and extreme (ICE) environments: review and integration***. Journal of Organizational Behavior, 39(6), 701-715.

Mathieu, J. E., Gallagher, P. T., Domingo, M. A., & Klock, E. A. (2019). ***Embracing complexity: Reviewing the past decade of team effectiveness research***. Annual Review of Organizational Psychology and Organizational Behavior, 6, 17-46.

Maynard, M. T., Kennedy, D. M., & Sommer, S. A. (2015). ***Team adaptation: A fifteen-year synthesis (1998–2013) and framework for how this literature needs to "adapt" going forward***. European Journal of Work and Organizational Psychology, 24(5), 652-677.

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The research included in this report was approved by the Research Ethics Committe of ISPA- Instituto Universitário (Ref. I/028/11/2019)