

**Lea Sophie Vink****Maximilian Peukert****Florian Ott**

MINDS ON AUTOPILOT

NAVIGATING THE LULLS IN AVIATION

Boredom in aviation is known amongst front-line practitioners but tends to be overlooked by organisations as a safety issue. In their study, **Lea Sophie Vink**, **Maximilian Peukert** and **Florian Ott** explored some of the influences on boredom and how people cope.

KEY POINTS

- **Prevalence of boredom:** Boredom is a widespread issue across aviation operations, impacting pilots and air traffic controllers alike, with male operators showing a higher susceptibility.
- **Personal coping strategies:** Aviation professionals use a variety of coping strategies, offering insights into resilience amidst monotony.
- **Organisational countermeasures:** There is a concerning gap in proactive training and systematic measures to address boredom, leaving operators vulnerable to its effects, especially with increasing automation in the industry. Organisational measures are also necessary to cope with boredom.

In safety-critical sectors such as the aviation industry, aircrews, air traffic controllers and engineers have careers with many days of routine and satisfactory work. Although all staff train for unusual and novel situations and regularly practise high-pressure and high-performance events, the aviation network and safety management systems depend upon operators having a relatively quiet and monotonous job where nothing out of the ordinary goes wrong. Pilots even have a phrase for this: “Hours of boredom, punctuated by seconds of terror.” But operators rarely train for this boredom, and relatively little time is devoted to education and practice about it. In the literature of Human Factors and psychology, there is surprisingly little written about how human beings cope with being bored, staying active and alert during monotonous times and – when demanded by situations – suddenly surge back to full performance and alertness.

Even more curiously, the scientific and medical academic literature is very sparse on what exactly boredom is. Is it a feeling? Is it a neurological phenomenon? What is the relationship to underloading or low arousal? Are certain people more susceptible? And how long does it take us to get bored? We are fascinated by these questions and especially the relationship to another foe of human performance: fatigue. For example, do boredom and monotony create more fatigue? Or do they reduce it because high intensity operations make us more fatigued?

With all these questions in mind, towards the end of 2023, we attempted to create a methodology to investigate the presence of boredom and monotony in aviation. Over three months, aviation professionals from around the world were invited to answer a short online survey. Primarily, the question of the prevalence and potential of boredom amongst pilots, air traffic controllers and technicians were investigated. Secondary to this was to establish what kind of coping strategies or training and systematic measures were in place. And thirdly, we wanted to test if our methodology could be replicated to delve deeper into the questions above.

The study consisted of the short boredom proneness scale by Struk and colleagues (2017) which is used to assess how prone to boredom people might be. We also utilised the Dutch boredom scale by Reijseger and Colleagues (2013) to understand if aviation had job-specific boredom issues. Finally, we utilised a series of qualitative questions about how individuals manage boredom and monotony. The first round of results did not disappoint! We collected responses from over 300 operators, with about 70% being air traffic controllers and 25% airline pilots and 5% technicians from over 25 countries. We had a good representation of female (25%) colleagues to male colleagues (75%) and a good distribution of ages and experiences with the majority being between 35 and 54 years old. Based on these data, we conducted detailed thematic analyses as well as an analysis using AI techniques to create a taxonomy of coping mechanisms and training tools.

So far, our results indicate that boredom and monotony are present within all operations, particularly amongst air traffic controllers, more so than pilots. We detected that male operators are statistically more likely to experience boredom than female colleagues but that there is no difference in the age of an operator and no cultural prevalence

“Boredom and monotony is present within all operations, particularly amongst air traffic controllers, more so than pilots.”

for boredom. This means that it doesn’t matter how experienced you are or where you come from, we all get bored in the aviation industry from time to time, with males tending to be more prone to suffering from boredom-related complaints.

We also found that staff working as instructors or on-job trainers are far less likely to experience boredom than those

not certified to act as instructors. This suggests that staff benefit from thinking about how their jobs work, actively engaging in a kind of meta-supervision of their own work from the perspective of a trainer or having learned techniques for conducting on-job monitoring of themselves and others. Or it could be simply that on-job trainers have a higher workload overseeing trainees, leading to less boredom.

Furthermore, our results confirm that:

1. Almost no operators are proactively trained either in basic/ on-the-job training or in regular crew resource management recurrent training sessions, with regard to boredom.
2. There is a lack of systematic countermeasures and procedures in place to assist operators in coping with boredom.
3. With the rise of automation and demand for finer efficiency margins, perceived boredom is increasing because pilots and ATCOs have fewer tasks to do when forced by company policy to adhere to autopilot or automated tools.

So, what can we do about it? The first thing to do is to understand where boredom comes from in the operation. The following figure created from our qualitative analysis, and first presented at the European Association of Aviation Psychology (EAAP) conference in Athens, reveals the key areas that induce boredom amongst our colleagues:

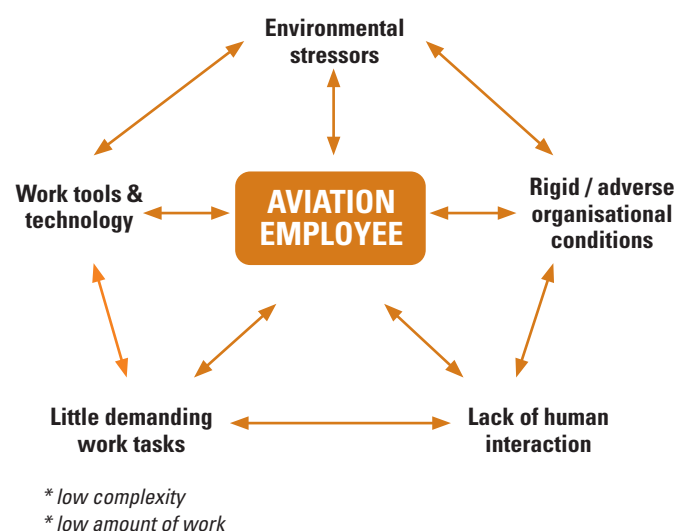


Figure 1: Where does boredom lurk and what are the main causes?

Unsurprisingly, low workload is a key factor. However, what was more surprising to us was that ‘lack of human interaction’ consistently featured as highly as low workload. Furthermore, environmental issues like vibrations, humming noises, light variation, temperature, and drizzle or long rainy conditions all affected the mood and feelings of boredom. Organisational conditions also featured heavily with participants regularly commenting everything from ‘too many rules’ to ‘not enough fun allowed’ as contributions to boredom.

And how do people cope with being bored? Figure 2 is a high-level view of the coping strategies and a first step in understanding what kinds of solutions could be taught to operators to help them cope. Our analysis has revealed a much more complex set of strategies that are different between pilots and air traffic controllers, which we will publish separately.

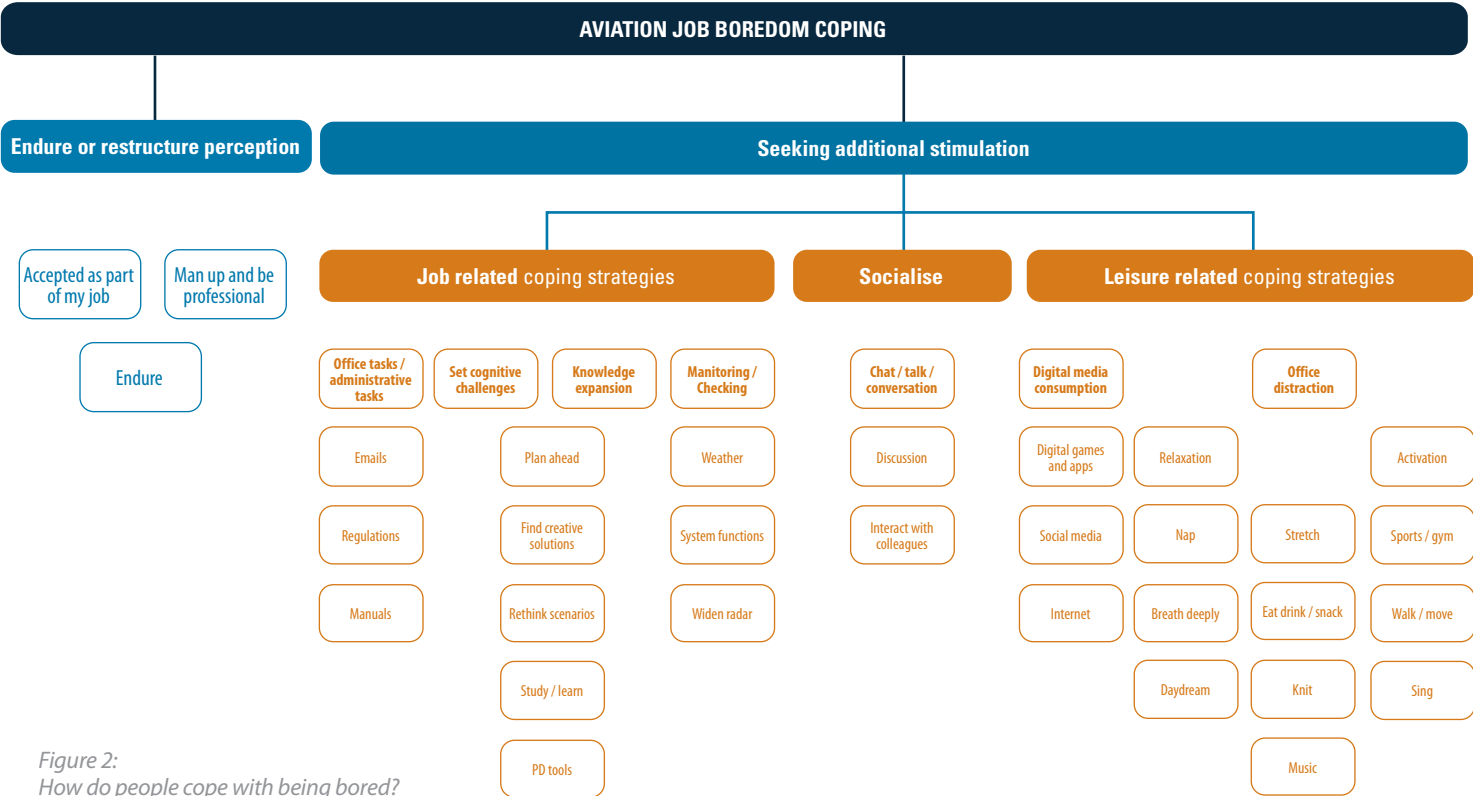


Figure 2:
How do people cope with being bored?

At first glance, many of these coping strategies should not be surprising. However, the qualitative comments revealed overwhelmingly that, in most cases, almost none of the socialising or leisure-related coping strategies are allowed in organisations. Some participants complained that some are actively forbidden such as using cell phones or talking to colleagues while on watch. Sadly, for us, some participants told us that “manning up and being professional” was about the best thing they were told to do when they were training, as well as just trying to endure and accept boredom in the job.

When we look at the literature and advice from occupational psychology, one thing we often find is that people do not just work for money. Socialising and participating in a culture that staff believe in and support are just as important as motivating factors. When staff are actively discouraged from socialising or sit in prolonged single-person operations, this not only has the inducing effect of boredom, but it also removes one of the key coping strategies and motivating factors of doing the job in the first place. This is a crucial finding in our study and should be part of all crew resource management training.

The other elephant in the room is the use of personal digital devices, like mobile phones, scrolling social media or watching films. As written in the Handbook of Fatigue Management in Transportation edited by Rudin-Brown and Filtress (2023), the use of digital devices to offset boredom and monotony is not only possible, but beneficial under the right circumstances – particularly when the situation is boredom inducing. It is better to be engaged in a cognitive task to stay in the loop than none. In fact, when battling fatigue or circadian rhythm variations, the use of digital devices may be the difference between falling asleep and staying at least partially engaged. Our study confirmed that most participants regularly use digital devices to offset boredom even when this might not be explicitly allowed. We particularly enjoyed some of the other more novel coping strategies such as knitting, crosswords and in some cases composing music!

This article has outlined some of the key findings of our study. In September 2024, we presented the comprehensive results at the European Association Aviation Psychology (EAAP) conference in Athens. We addressed the detailed thematic and taxonomy findings of our qualitative results and proposed a more thorough set of recommendations.

Our study comes at a crucial time in which new evidence is also emerging about the prevalence of fatigue across all our operations. For example, a major EASA study (2024) on fatigue has found that every extra hour in one work session increases fatigue by 33% and that night duties increase fatigue by 253% (EASA, 2024). Another study due in 2024 has also shown that highly complex operations can induce acute fatigue (measured via a reduction in reaction rates) at a much faster rate than previously assumed. When this is combined with long shift types, the risk of chronic fatigue and sleeping issues increases.

These results must be considered within the broader context of workload and boredom coping mechanisms, and we need to be far better at training and practising these strategies, especially if we are planning to introduce more automation and increase the use of single-person operations. But mostly, the lesson learned in our study is that a bored operator can be almost as problematic as a highly stressed operator and that we must do better to design our systems with this in mind.

For further information please contact Lea-Sophie Vink at lea-sophie.vink@austrocontrol.at

EASA (2024). Study on the Analysis, Prevention and Management of Air Traffic Controller Fatigue, May 2024. Available at:

<https://www.easa.europa.eu/en/domains/air-traffic-management/atmans-workforce-air-traffic-controller-%28ATCO%29-fatigue>

LEA SOPHIE VINK is a clinical cognitive neuropsychologist and the Human Performance Management Lead at Austro Control. Additionally, she chairs the CANSO Human Performance Workgroup and co-chairs the EU Commission Expert Group on the Human Dimension in Aviation. A former Royal New Zealand Navy navigation and commanding officer, Lea is now an Accredited Aviation Psychologist, manager and researcher specialising in cognitive psychology metrics, fatigue risk management, and AI-driven human performance control.

MAXIMILIAN PEUKERT is an aviation psychologist working as a Human Factors Specialist at the Swedish Air Navigation Service Provider (LFV) in Malmo. His research focuses on fatigue, shift work and workload in air traffic control. He is a member of the CANSO Human Performance Management Working Group and the EASA Human Factors Collaborative Action Group. maximilian.peukert@lfv.se

FLORIAN OTT completed a Bachelor degree in psychology at TU Dresden and is finalising his Master's thesis in Psychology: human performance in socio-technical systems. As part of this thesis, he investigated boredom and boredom in aviation. Florian is also interested in engineering and clinical psychology and has worked for the last 5 years at the university hospital in Dresden.