

Improving police performance by training officers to manage stress

Policing is a high-stress occupation in which making mistakes can have serious consequences. **Dr Judith Andersen**, a Canadian researcher specialising in psychophysiology and health, has teamed up with **Dr Harri Gustafsberg**, a Finnish retired police officer who now works as a mental resilience coach, and **Dr Joseph Arpaia**, a psychiatrist in the US. Together, they have developed an innovative training method to help police officers understand and manage their psychological and physiological responses to stress, enabling them to make better decisions in the line of duty.



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Research project

Developing a programme to reduce police officer stress and improve decision making

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Talk like a ...

psychophysiolgist

Autonomic nervous system — the part of the nervous system that regulates involuntary physiological processes

Biofeedback — monitoring a physiological response, such as heart rate, and using this information to control it

Heart rate variability — the variation in time intervals between heartbeats

Parasympathetic nervous system — the part of the autonomic nervous system which relaxes the body

after periods of stress and helps to modify overactivation of the sympathetic nervous system

Psychophysiology — the study of how the mind and body interact

Sympathetic nervous system — the part of the autonomic nervous system that helps the body activate the 'fight or flight' response

Vagus nerve — the nerve that, as part of the parasympathetic nervous system, sends signals between the brain, heart, lungs and digestive system

Policing is a prime example of a career in which appropriate responses to dangerous situations are vital. Police officers are trusted to de-escalate threatening situations with minimal use of force. However, even though police training emphasises this approach, the body's stress response can override this training and cause an officer to make mistakes in the heat of the moment. In some cases, this can lead to tragic outcomes.

Understanding and controlling this stress response is, therefore, crucial.

To address this challenge, Dr Judith Andersen, from the University of Toronto, assembled a team of experts who each brought unique skills to her project. As a psychophysiology and health researcher, Judith has expertise in the development of field-based psychophysiological interventions. She paired up with Dr Harri Gustafsberg, who understands the stress of policing first hand from his experience as an



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operational commander in the Finnish Police National Special Intervention Unit and from his work as a mental resilience coach. Together, they teamed up with psychiatrist Dr Joseph Arpaia, who is an expert in psychophysiology-based treatments and behavioural modification. “We each bring unique expertise from our fields,” says Judith. “Working together means that we are more confident in the positive results of our research and fieldwork.”

Responses to stress

The body’s response to threats is powerful. A surge of chemicals, including adrenaline and hormones such as cortisol, can trigger the ‘fight or flight’ response, which primes the body to take rapid physical action to escape or overcome a threat. “When this response is moderate, it enhances performance through more accurate vision, hearing, motor control and reaction time,” explains Judith. “However, when the response is more severe, it can negatively affect performance.” For instance, people experiencing an extreme stress response may have distorted thinking and poor motor control. Overactivation can impact their decision-making ability when dealing with threats. And recurring extreme stress activation increases the risk of the person developing physical and mental health conditions.

Our autonomic nervous system regulates involuntary physiological processes, such as heart and breathing rates, and is responsible for the physiological changes that we experience during stressful situations. “The parasympathetic nervous system (the part of the autonomic nervous system responsible for recovery and focused attention) is suppressed within milliseconds of a stressful situation arising,” explains

Joseph. “This allows unchecked activation of the sympathetic nervous system (the part of the autonomic nervous system that readies the body for fight or flight).” This increases heart and breathing rates, but also decreases cognitive processing, oxygen delivery to the brain, and fine motor skills. “This process is beneficial for purely physical tasks, such as running and fighting,” says Joseph. “However, other skills, such as verbal abilities and response inhibition, become less effective. Police need the ability to simultaneously engage physical, verbal and social skills to de-escalate situations and improve safety. That was an existing gap in police training that our research addresses.”

Hearts and minds: the research process

Judith first visited Harri at the Police University College of Finland in 2013. Over the next year, they observed officers and collected psychophysiological data during high-intensity training exercises. Judith’s research lab is an ‘ambulatory’ lab, meaning it contains equipment that allows her to measure psychophysiological responses to stress in the field, rather than in the lab. This means she can measure police officers’ heart and breathing rates and hormone levels while they move around and take part in training scenarios.

“Collecting data during fast-paced critical incident scenarios, such as simulated accidents or active shooter drills, was challenging,” says Harri. “Equipment that works in the lab often fails in field settings, so we had to identify techniques that accurately monitored officers on the move.” This led Judith and Harri to Joseph. He had developed psychophysiological monitoring equipment and software for treating his

patients, which was just what the team needed for monitoring police officers. Over the years, Judith, Harri and Joseph uncovered how and why police officers at every level (from new recruits to those in top-level tactical units) respond to stress during active duty. “We found that increased heart rate is an indicator of activation of the sympathetic nervous system and suppression of the parasympathetic nervous system. This leads to a greater risk of making mistakes, such as forgetting to use de-escalation techniques or using unnecessary force,” says Judith. “We also observed that many officers were unable to recover quickly from stressful situations, putting them at risk of exhaustion, burnout and future mistakes.” These results indicated a need to develop techniques that allow officers to have greater control over their stress responses.

Listen to your heart: biofeedback training

One variable the team measured in officers was the variation in time between heartbeats, known as heart rate variability. “Healthy heart rate variability indicates an adaptive response to stress, but severe or long-term stress can cause heart rate variability to become unhealthy,” says Judith. “We use heart rate variability biofeedback (HRVB) to help officers know when their heart rate variability is reaching unhealthy levels, so they know when to apply techniques to keep it in a healthy range.”

HRVB involves monitoring real-time changes in heart rate variability and using this information to control it. Using the heart rate monitor and app designed by Joseph, police officers can observe their heart rate during training exercises and ➔

understand the extent to which their body's stress response affects their physical and psychological state. They can also see how the use of techniques, such as breathing training, can control their heart rate variability and improve their performance.

The team developed training techniques that use HRVB to help officers better regulate their stress response. "The first technique we teach is the 'reset breath'," says Joseph. "This is a prolonged exhalation that gives the brain a short window of time to shift attention from the stress response and refocus on the task at hand." By stimulating the vagus nerve, a key component of the parasympathetic nervous system, the reset breath allows for a more balanced interplay between the sympathetic and parasympathetic nervous systems. The team describes this technique as a 'manual override' of the stress response that, with repeated training, can be conditioned so that

officers perform this technique in stressful situations without even thinking about it. This reset breath is integrated into live action fieldwork settings through the team's 'Reset, Refocus, Respond' technique.

The team found that HRVB training was a powerful way to improve police officer performance. "We observed that HRVB training was associated with reduced use of force, fewer lethal force errors, improved communication skills and improved situational awareness," says Harri. "This training not only makes situations safer for the public, but it also improves the health of officers by preventing chronic stress from accumulating over time."

iPREP: International Performance Resilience and Efficiency Program

Judith, Harri and Joseph have now rolled out a police training programme that

makes use of the lessons learnt from their research. "iPREP teaches officers about biological awareness and psychological and physical responses to their environment," says Harri. "Police officers often don't understand the link between these reactions and their performance – iPREP aims to change that."

iPREP training focuses on reality-based scenarios, using HRVB to help officers understand their body's reaction to stress and how this influences their decision-making process. Officers are then taught methods to gain better control over their stress response. "Any taught behaviour or skill that is performed during stressful situations needs to become an automatic response for officers," says Judith. iPREP has been fully accredited by the University of Toronto Temerty Faculty of Medicine and is now used to train police officers in North America and Europe.

About psychophysiology

Do you blush when you feel embarrassed? Does your heart rate increase when you feel excited or scared? These physiological responses to psychological processes are what psychophysiology is all about. "Psychophysiology is the study of the interaction between mental and biological processes," explains Judith. These mental processes include cognition, mood, perception, decision making and stress, while biological processes include cellular electrical activity, metabolism and hormone secretion.

Studying the interface between psychology and

physiology requires a strong understanding of both disciplines, and how each influences the other. "Psychophysicologists use a wide range of equipment," says Joseph. "This can range from simple heart rate monitors to magnetic resonance imaging (MRI) machines that measure brain activity in real time." While Judith, Harri and Joseph's psychophysiology research is conducted with human subjects, some scientists study psychophysiological processes in animals (usually rats). This allows them to conduct more invasive experiments, such as inserting probes in the brain to directly measure biological processes and responses.

Pathway from school to psychophysiology

At school and beyond, study biology, chemistry, psychology and mathematics. “Psychophysiology blends understanding from lots of scientific areas,” says Judith. “Key topics include human physiology, psychology, cognitive science, biochemistry, mathematics, statistics and neuroscience. These areas of study are necessary to understand the psychophysiological processes taking place and the methods that are used to analyse them.”

Some universities offer degrees in psychophysiology. A degree in psychology, physiology or medicine could also lead to a career in psychophysiology.



Meet Judith

As a teenager, I had a wide range of interests. I was on the acro-gymnastics team, sang in a choir and loved being outside in nature as much as possible. My parents were in health and caring professions, and their influence caused my interest in psychology.

Growing up, my family moved every few years, so I experienced many different environments. Seeing the diversity of nature between Ontario, Arizona and California was a formative experience that began my love for health psychology. However, moving all the time was also very stressful and impacted my education. I was a shy child and sometimes experienced paralysing fear. Despite this, I sought out whatever assistance I could to support my learning. However, I always wished for more tangible ways to reduce my stress.

When several of my peers joined the military, I was amazed by their stories of facing extreme stress. During my master’s degree in counselling, I completed an internship at a veterans’ hospital where I met many soldiers and veterans with experiences of post-traumatic stress disorder (PTSD). Along with my own experiences, that inspired me to research ways to help people feel relief from stress while staying healthy and performing at a high level in their careers.

“Growing up, my family moved every few years... which was very stressful. I always wished for more tangible ways to reduce my stress.”

As a psychophysiology and health researcher, I enjoy being embedded with teams of police officers in the field. I conduct research directly in the environments relevant to the people I’m working with. I’ve accompanied training exercises at military bases and measured physiological reactivity of federal officers while on duty and during advanced exercise courses. This gives me the opportunity to better understand the realities of these careers and to create tangible ways to reduce stress and boost health.

I am obsessed with gardening and enjoy listening to audio books. I also love taking my dogs on long hikes. My happiest days are a combination of all these activities!

Explore careers in psychophysiology

Some psychophysicists work in academia, where they conduct research with human or animal subjects to understand how the body responds to psychological processes. Others have clinical careers, where they work with patients to help them manage their body’s responses to psychological inputs.

Judith suggests contacting psychophysiology researchers at nearby universities and asking them about their research and whether they have any career advice or work experience opportunities.

The Society for Psychophysiological Research (www.sprweb.org) and the International Organization of Psychophysiology (www.iopworld.org) have information and resources about the field. When you start university, Judith recommends reading articles from the International Journal of Psychophysiology (www.sciencedirect.com/journal/international-journal-of-psychophysiology) and Psychophysiology (www.onlinelibrary.wiley.com/journal/14698986) to learn about current research topics (your university should have a subscription so you can access them).



Meet Harri

As a teenager, I lost interest in studying and did all kinds of stupid things. But then I discovered karate, which changed my direction entirely. Participating in martial arts helped me take responsibility at school and in my life and it awakened my curiosity in humanity's potential.

Growing up in northern Finland, I was surrounded by a unique blend of athleticism and adventure. My father was a renowned former elite discus thrower, and a steady stream of ex-athletes were always arriving at our doorstep. These visits often led to unforgettable hunting and fishing trips, with tales of past glory days. Many visitors were also police officers, giving me a glimpse into the world of law enforcement that seemed both thrilling and daunting.

I worked in the Finnish National Police Special Intervention Unit for over 20 years. When I joined, the unit was suffering

after a failed hostage rescue operation and organised crime was spreading in the country. We had to react, but even though we developed our tactical procedures, training systems and operative management skills, we made too many mistakes.



I wanted to understand the mind-body connection behind stress in life-threatening situations.



I wanted to understand why these mistakes happened. Why did stressful situations cause us to lose situational awareness and make bad decisions? I wanted to understand the mind-body connection behind stress in life-threatening situations. So I trained as a mental resilience coach, where I learnt that we must master our internal responses to stress.



Harri with Epi, his special unit attack dog

These days, my time is spread among many different activities. In addition to participating in scientific research projects, I am writing a book and I lead online coaching programmes and one-to-one coaching. I am an entrepreneur and every day is different, which I love.

In my free time, I love sports. I go to the gym and enjoy trail running in the forest. I also play music.



Meet Joseph

As a teenager, I wanted to understand how the world around me worked. I was fascinated by meditation and the link between body and mind. I studied martial arts, and the mind-body links formed through martial arts and meditation have been central to my life ever since.

I had a hard time choosing what to study at college. I settled on chemistry, but even after graduating, I wasn't sure what I wanted to do. I worked in a lab doing molecular

genetics research, which was exciting and very new at the time, but I kept reading about psychology. I decided I wanted to learn how to apply the skills I had learnt from intense training in martial arts and meditation to healing people and teaching people to heal themselves. That led me to become a physician specialising in psychiatry.

I use both medication and psychotherapy when working with my patients. We talk about their physical and emotional responses to internal and external experiences, and how to make those responses more helpful. I use biofeedback to help them get more control over their autonomic nervous system and to manage stress.

Many of my patients are healthcare professionals or first responders. They need techniques to perform effectively in

high-stress situations. My martial arts and meditation training taught me many such techniques, and I am able to combine these with knowledge of psychophysiology to help patients respond effectively under stress.

I became aware of Judith's work with police officers after hearing her on a podcast. It linked with my clinical work, so I called her and we spent two hours talking about stress, physiology and its effects on performance. She invited me to work with her team and I am very glad to be doing so.

In my free time I enjoy reading, meditating, spending time with family and philosophising about life. I also love writing, especially about meditation and stress. I co-authored a book on meditation that received a foreword from the Dalai Lama!

Meet the *iPREP* content contributors



Sergeant Lissa Ruocco

Lissa has over 25 years of experience in law enforcement. She has spent 18 years in the tactical unit, working as a sniper (the first female sniper in all of Canada), negotiator, rappel master, fitness appraiser, team leader and training officer. Lissa loves to encourage people to pursue a career in tactical policing and has won the Ontario Women in Law Enforcement's Mentoring and Coaching Award.



Retired Senior Constable Steve Poplawski

Steve has over 30 years of experience as a police officer and use of force instructor. He has developed and taught evidence-based de-escalation techniques and has worked with many first responder groups. Steve has particular expertise in scenario-based learning and defensive tactics, including in criminal investigations and frontline operations.



Retired Sergeant Don Back

Don has over 30 years of experience in law enforcement, with extensive expertise in use of force training, legislation, and criminal and sexual assault investigations. He has worked as a use of force instructor at the Ontario Police College and the Canadian Police College, and he has particular expertise in scenario-based learning and defensive tactics.



Dr Paula Di Nota

Paula studies the complex relationships between learning, stress, performance and mental health in police and other public safety professionals. She has conducted field investigations using ambulatory HRVB with law enforcement officers in Canada and Europe, with the aim of improving physiological resilience, cognition and motor performance.



Retired Chief Gene Di Maria

Gene has over 25 years of community corrections experience, having served as a probation officer and supervisor, and he was instrumental in the development of the US Federal Probation and Pretrial Academy. He has worked as a use of force instructor, firearms instructor, defensive tactics instructor and scenario-based training instructor, and he served as chief of safety and firearms for the Probation and Pretrial Services Office of the US Courts.



Dr Juha-Matti Huhta

Juha-Matti has over 20 years of police experience, including in a K-9 (police dog) unit and a regional special response team. His scientific research focuses on understanding and developing situational awareness in policing and using evidence-based approaches to police training.