



# Psychophysiology

with Dr Judith Andersen, Dr Harri Gustafsberg and Dr Joseph Arpaia

## Talking points

### Knowledge

1. What is the fight or flight response?
2. What is biofeedback?

### Comprehension

3. Why is it important for police officers to be able to control their stress response?
4. What are the physiological changes associated with activation of the sympathetic nervous system?

### Application

5. How would you conduct a research study to understand the psychophysiological mechanisms driven by the 'reset breath'? What hypotheses would you test, and what experimental techniques could you use?
6. How have Judith, Harri and Joseph's personal skills contributed to their roles within the project?
7. What other professions might benefit from heart rate variability biofeedback (HRVB) training, and why?

### Analysis

8. Some effects of the fight or flight response seem counter-productive, such as distorted thinking and reduced fine motor skills. Why do you think seemingly problematic responses evolved in humans?
9. Why is it important that Judith has an ambulatory lab?

### Evaluation

10. When police operations go wrong (for example, a police officer wounds a civilian) the officer may cite the fight or flight response as the cause of their misjudgement. To what extent do you think this is a justifiable reason? Use information from the article and from your own knowledge in your answer.

## Activities


### 1. Psychophysiological experiment

You can measure some psychophysiological functions in the classroom. For example, heart rate can be measured by locating your pulse in your neck or wrist and measuring the number of beats per minute, while breathing rate can be measured by counting the number of breaths per minute. If you have access to a blood pressure cuff, you can also measure blood pressure.

Design an experiment to determine the links between psychological inputs and physiological responses. For example, you could measure physiological factors before and after participants watch videos designed to elicit different emotional responses, such as excitement, stress, relaxation, joy or boredom (ensure all videos are suitable for the classroom).

When designing your experiment, consider the following:

- What are your hypotheses?
- What are your independent and dependent variables?
- How will you keep all other variables constant?
- Will your results show causation or correlation?
- What information will you give participants before they participate?
- What data will you collect from participants? (keep in mind the importance of anonymity in your results)



The iPREP team observes SWAT (special weapons and tactics) training exercises to monitor officer stress levels in real time © Judith Andersen

### More resources

- Learn more about iPREP: [www.proresilience.org](http://www.proresilience.org)
- Find more information about iPREP: [linktr.ee/i\\_prep](http://linktr.ee/i_prep)
- The iPREP protocol has been published: Andersen, JP, Arpaia, J, Gustafsborg, H., Poplawski, S., Di Nota, PM. (2024). The International Performance, Resilience and Efficiency Program Protocol for the Application of HRV Biofeedback in Applied Law Enforcement Settings. Journal of Applied Psychophysiology and Biofeedback [link.springer.com/article/10.1007/s10484-024-09644-3](https://doi.org/10.1007/s10484-024-09644-3)
- Learn more about the research conducted in Judith's ambulatory lab: [www.hartlab.net](http://www.hartlab.net)
- This video provides an interesting and accessible explanation of the 'fight, flight or freeze' response: [www.youtube.com/watch?v=jEHwB1PG\\_-Q](https://www.youtube.com/watch?v=jEHwB1PG_-Q)
- This article and podcast look at how breathing techniques can regulate stress responses: [www.bbc.co.uk/programmes/articles/1mW6885X3N2gKnVjXT00KcJ/how-to-reset-your-brain-with-your-breathing](https://www.bbc.co.uk/programmes/articles/1mW6885X3N2gKnVjXT00KcJ/how-to-reset-your-brain-with-your-breathing)

- How will you accurately record your results?
- How will you process, analyse and display your results?

Perform your experiment with your classmates, then collect and analyse your results. What have you discovered about the links between psychological inputs and physiological responses? Present your findings as a short presentation that highlights your hypotheses, methods, results and conclusions. What were the limitations of your experiment? What further experiments would you like to conduct if you had access to more scientific equipment?

## 2. iPREP briefing session

Imagine you are leading an iPREP training session for police officers. Your first task is to brief officers on what to expect from the session and explain why it will be useful for them. Design a short briefing speech and/or presentation to convey this, using the information in the article to help you.

Consider the following:

- How can you explain the anticipated structure of the session accessibly and clearly?
- What background detail is going to be most useful for them to know? Police officers are rarely scientists. Adapt the language and level of technical detail you use accordingly.
- The iPREP session will likely be quite different from what officers are accustomed to, especially regarding the use of biofeedback devices and consideration of psychophysiology. How can you make them feel at ease?
- How can you convince officers about the usefulness of the session?

Present to a group of classmates who take on the role of police officers. Answer any questions they may have. Do they seem ready to undertake the training session?