I'm going mobile! Evidence supporting the implementation of wireless devices to measure physiology in the lab (and beyond)

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Overview

- Advances in technology have provided mobile methods for physiological data collection.
- Despite prevalence of wireless devices, uptake by researchers has been limited.
- Measuring physiology outside the lab may improve ecological validity and better inform interventions.

Experiment 1

Method

- Participants were male academics (*N* = 70)
- Assessed wireless electrodermal activity (EDA) via Biopac BN-PPGED amplifier during virtual reality.
- Participants took part in a male-dominated research conference and took perspective of female scientist.

Results

- Men assigned to female avatar had higher EDA than those assigned male avatar, *t*(68) = -2.18, *p* = .033.
- EDA mediated support for equality initiatives after perspective-taking, *b* = 0.10, 95% CI [0.02, 0.23].

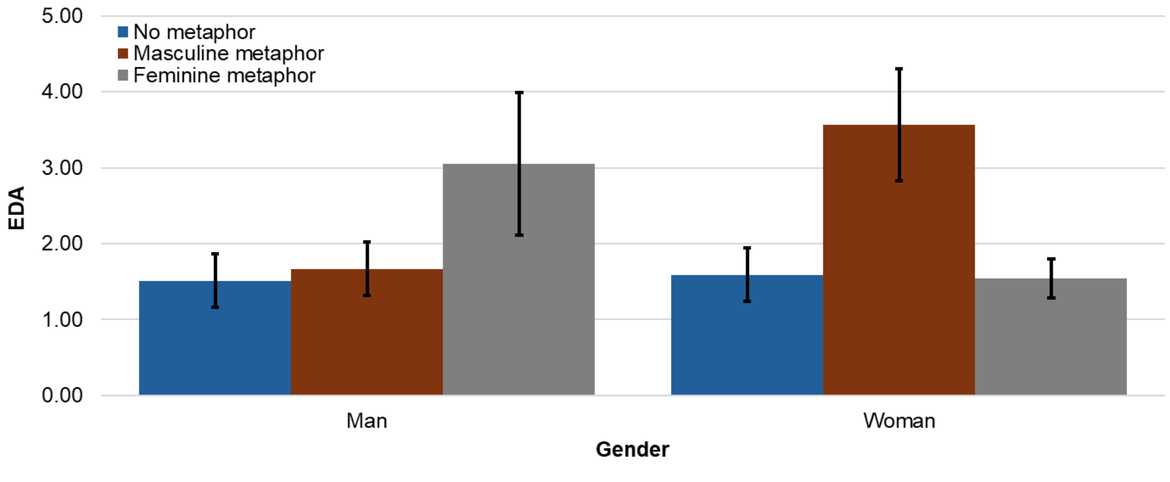
Experiment 2

Method

- Participants were undergraduate students (*N* = 58)
- Assessed wireless EDA via Shimmer GSR+ sensor.
- Prior to an interview, ideal job candidates described using masculine, feminine, or no metaphors.

Results

- Masculine metaphors increased EDA during the interview among women, *F*(2,52) = 4.65, *p* = .014.
- Women's EDA mediated the time to complete the trail making test, *b* = -26.44, 95% CI [-62.72, -0.47].



Experiment 3

Method

- Participants were undergraduate students (*N* = 28)
- Assessed wireless electroencephalogram (EEG) via Advanced Brain Monitoring B-Alert X10.
- During a group problem solving exercise (2 naïve participants, 2 confederates) asymmetrical activity of the PFC was used to assess approach motivation.

Results

- Left PFC activity increased during group problem solving (*M* = 0.12, *SD* = 0.15) compared to baseline (*M* = 0.02, *SD* = 0.16), *t*(27) = -2.74, *p* = .011.
- Left PFC activity predicted quicker time to complete the trail making test, *r*(26) = -.655, *p* = .002.

Experiment 4

Method

- Participants were undergraduate students (*N* = 71)
- Assessed wireless EEG via Neuroelectrics Enobio 8.
- Prior to completing the balloon analogue risk task, participants drank alcoholic or placebo beverages.

Results

- Placebo beverages elicited greater left PFC activity (*M* = 0.20, *SD* = 0.41) compared to alcoholic drinks (*M* = -0.01, *SD* = 0.46), *t*(69) = 2.00, *p* = .049.
- Left PFC activity predicted poorer decision making after placebo beverages, *t*(67) = -2.80, *p* = .007.