SENSORY ATTENUATION UNVEILS THE EFFECT OF FATIGUE ON THE SENSE OF AGENCY

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BACKGROUND AND AIM

The sense of agency is the feeling of control over actions and their consequences. This fundamental component of bodily self-awareness can interact with fatigue, i.e., the feeling of overwhelming tiredness and exhaustion associated with voluntary action. An emerging model (Sensory Attenuation Model of Fatigue, SAF) suggests that fatigue might interact with sense of agency by interfering with Sensory Attenuation (SA), a perceptual phenomenon whereby self-generated sensory inputs are less intense than externally-generated inputs. Yet, the mechanisms underlying the relationship between fatigue and sense of agency remains unclear.

AIM

Providing behavioral evidence to the proposed model by investigating the impact of susceptibility and acute induced fatigue on Sensory Attenuation.

METHODS

Participants

43 healthy subjects (23.24 ± 3.62)

Fatigue Severity scale (Susceptibility to fatigue)

HIGH FSS

n = 22
Age = 23.64 ± 4.20
Sex = 9 M

LOW FSS

n = 21
Age = 22.95 ± 2.87
Sex = 13 M

Force Matching Task (FMT)

Day 1

No-Fatigue Session

Day 2

Acute Fatigue Session

Protocol

INDIRECT CONDITION

DIRECT CONDITION

INDIRECT Fatigue Task

DIRECT Fatigue Task

Fatiguing Task: sustained maximal contractions with a handgrip to induce acute fatigue.

RESULTS

SA index = \( \frac{F_{\text{Matched}}}{F_{\text{Target}}} \)

- \( \approx 1 \) ACCURATE estimation
- \( > 1 \) OVERESTIMATION of target force
- \( < 1 \) UNDERESTIMATION of target force

INDIRECT

DIRECT

SENSORY ATTENUATION

Overestimation

Underestimstion

0.0

0.5

1.0

1.5

2.0

2.5

Direct

Indirect

DISCUSSION

Subjects with high trait fatigue show reduced sensory attenuation, suggesting an interaction between high fatigue susceptibility and reduction in the individuals’ ability to distinguish between self and externally-generated stimuli. The current study gathered new insights on the impact of fatigue on the sense of agency, providing groundbreaking evidence in favor of the SAF model in a healthy population.

REFERENCES


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