

Arousal effects on time perception and timed behaviour

ABSTRACT:

Background

Emotional distortions to time are hypothesized to occur because of changes in physiological arousal. Increases in sympathetic nervous system (SNS) reactivity are associated with a lengthening of perceived duration whereas increases in parasympathetic nervous system (PSNS) reactivity are associated with a shortening of perceived.

Aim

To examine the autonomic mechanisms underlying the impact of stressors on time perception and timed behaviour. To examine stress-induced increases in SNS activity lead to an overestimation of time and that increased PSNS activity attenuates this effect.

Method

Five experiments were conducted. SNS activity was increased through stress induction using emotional images or white noise. PSNS activity was increased using a controlled breathing exercise. SNS activity was indexed using Pre-ejection Period (PEP) and skin conductance level. PSNS activity was indexed using High-frequency heart rate variability (HF-HRV). Time perception was assessed using a verbal estimation task, timed behavior was assessed using a rhythm production task.

Results

Across multiple experiments, stress induced increases in SNS reactivity were negatively correlated with perceived duration on time perception tasks, but only when the stimuli were highly arousing and negatively valenced. Increasing PSNS activity reduced perceived duration on time perception tasks. SNS and PSNS activity was unrelated to timed behavior.

Conclusions

Emotional distortions to time appear to result from a combination of bottom up (SNS activity) and top down (threat-detection) processes. Increasing PSNS activity offers a mechanism to reduce the perceived duration of negative events and improve wellbeing.

Keywords

Time perception

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Published Work:

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