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Acute stress influences the discrimination of complex scenes and complex faces in young healthy men.

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Abstract

The stress-induced release of glucocorticoids has been demonstrated to influence hippocampal functions via the modulation of specific receptors. At the behavioral level stress is known to influence hippocampus dependent long-term memory. In recent years, studies have consistently associated the hippocampus with the non-mnemonic perception of scenes, while adjacent regions in the medial temporal lobe were associated with the perception of objects, and faces. So far it is not known whether and how stress influences non-mnemonic perceptual processes. In a behavioral study, fifty male participants were subjected either to the stressful socially evaluated cold-pressor test or to a non-stressful control procedure, before they completed a visual discrimination task, comprising scenes and faces. The complexity of the face and scene stimuli was manipulated in easy and difficult conditions. A significant three way interaction between stress, stimulus type and complexity was found. Stressed participants tended to commit more errors in the complex scenes condition. For complex faces a descriptive tendency in the opposite direction (fewer errors under stress) was observed. As a result the difference between the number of errors for scenes and errors for faces was significantly larger in the stress group. These results indicate that, beyond the effects of stress on long-term memory, stress influences the discrimination of spatial information, especially when the perception is characterized by a high complexity.

KEYWORDS:

Hippocampus; Medial temporal lobe; Perception; Socially evaluated cold-pressor test; Stress; Visual discrimination

Highlights

- Stress is known to influence the hippocampus.
- The hippocampus is involved in the perception of complex scenes.
- Acute stress tended to impair the discrimination of complex scenes.
- Acute stress had no significant effect on the discrimination of faces.

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