The cognitive and neural moderators of hypomania and economic risk-taking

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Overview

Hypomania is a state of elevated mood and energy, which can occur in clinical and non-clinical populations. While it can feel subjectively positive, hypomania can disrupt thinking and judgement, leading to increased risk-taking behaviour. Hypomania often leads to excessive spending, gambling or borrowing, which can lead to severe negative consequences. Research suggests that the relationship between hypomania and economic risk-taking could be explained by reduced ability to perceive risk, executive function issues, or hyperfocus on reward. This poster outlines several studies which are taking place in our lab to better understand this phenomenon, using a cognitive neuroscience approach.

Keywords: Hypomania, Cognition, Risk, Brain-imaging

Background

- Previous work has suggested that hypomania might lead to increased reward sensitivity or reduced risk perception. However, empirical work which directly measures each of these constructs is limited.
- Neural correlates of hypomania also need further investigaion, as hypomania is often examined in the context of bipolar disorder, making it difficult to disentangle the role of hypomania from those of co-morbid conditions.
- We know that executive function can be impaired and impulsivity heightened in hypomnanic states, but it is unclear if these deficits are driving the relationship between hypomania and risk-taking.

Research questions

Study 1:

Do hyperfocus or impulsivity moderate the relationship between hypomania and economic risk-taking?

Study 2:

1a. Do reward sensitivity or risk perception moderate the relationship between hypomania and economic risk-taking?

1b. Do interactions between hypomania and reward sensitivity or risk perception predict neural activation in the prefrontal cortex during economic decisions?

2a. Do working memory or response inhibition moderate the relationship between hypomania and economic risk-taking?

2b. Do interactions between hypomania and working memory or response inhibition predict neural activation in the prefrontal cortex during economic decisions?

Methods

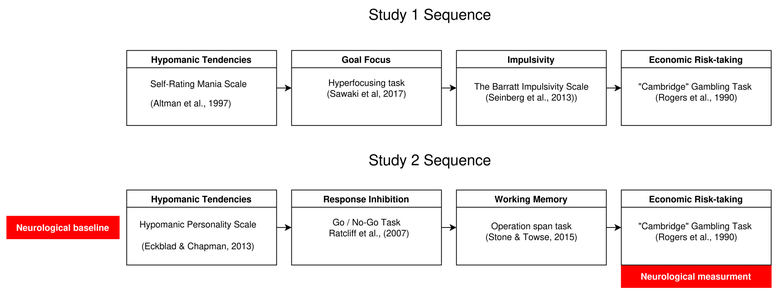

Figure 1: Overview of study procedures

fNIRS is used in Study 2 to measure prefrontal cortex activation during a risk-taking task. This allows us to examine the neural correlates of hypomania and risk-taking in real-time, at different stages of the decision-making process.

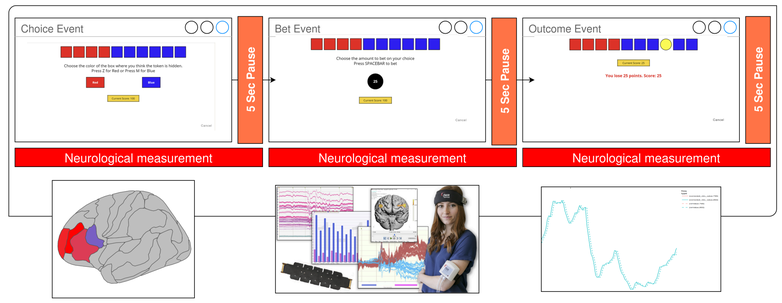

Figure 2: Neurological measures during decision-making

Predicted Results

In line with previous research, we expect to find that hypomania is associated with increased risk-taking. However, we expect to gain a clearer understanding of:

1. Which dimensions of the risk decision-making process are predicted by hypomania
2. How cognitive moderators (e.g., reward sensitivity, risk perception, executive function) interact with hypomania to predict these dimensions risk-taking behaviour.
3. Which areas of the brain are activated during risk-taking decisions, and how activation patterns could be indicative of the interaction between hypomania and cognitive moderators.

Applications and future directions

- Understanding the cognitive and neural moderators of hypomania and risk-taking has applications in clinical settings for the treatment of bipolar disorder.
- The current work will also expand our understanding of risk-perception more generally, which has applications for gambling, addiction, and other risk-taking behaviours.