

# How are Irritability and Anhedonia Symptoms Linked? A Network Approach

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## Introduction

- **Irritability and anhedonia** are common symptoms of major depressive disorder (MDD) that predict **greater depression severity** and **poor outcomes**, including **suicidality**.
- Anhedonia is a **multifaceted symptom** that reflects impairments in several dimensions of reward processing (i.e., **consummatory pleasure, desire, motivation, and effort** to pursue reward).
- Both symptoms have been proposed to result from **paradoxical reward processing dysfunctions**, but the interactions between them remain unclear.

## Aim

→ Analyze how each facet of anhedonia interacts with irritability using a **network analysis**.

## Method

### Participants (N = 448)

- **422 healthy subjects** ( $M_{age} = 32.59$  ;  $SD = 14.38$ , 82.20% female)
- **26 patients suffering from depression or bipolar disorder**, recruited from hospitals and clinics ( $M_{age} = 44.31$ ,  $SD = 13.43$ , 84.60% female)
- Exclusion criteria : past or current drug/alcohol dependence, medical, or psychiatric ( $\neq$  depression/anxiety) condition.

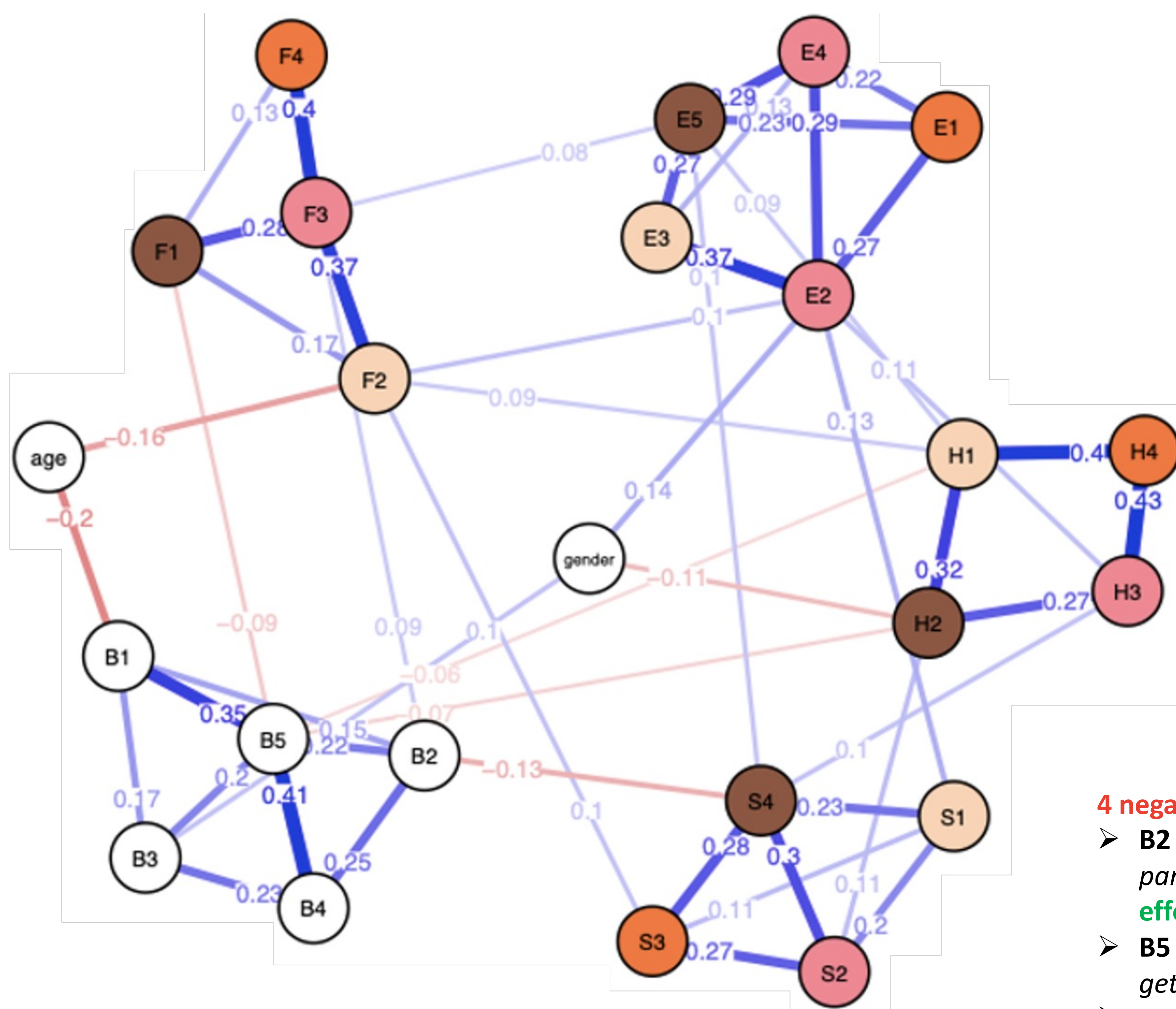
### Questionnaires

- *Dimensional Anhedonia Rating Scale* (DARS, Rizvi et al., 2015)
- *Brief Irritability Test* (BITe, Holtzman et al., 2015)
- Correlation between DARS and BITe :  $r = -.12$ ,  $p < .05$

**Data analysis** : a regularized Gaussian Graphical Model to estimate the network structure between items.

Figure 1. Network of Anhedonia and Irritability Symptoms.

## Results



### DARS items :

- Hobbies : H1-H2-H3-H4
- Food : F1-F2-F3-F4
- Social activities : S1-S2-S3-S4
- Sensory experiences: E1-E2-E3-E4-E5

### BITe items: B1-B2-B3-B4-B5

### Components of hedonic treatment :

- Motivation
- Effort
- Desire
- Pleasure

- Positive partial correlation
- Negative partial correlation

### 1 positive correlation between BITe items and DARS items

- **B2** « I have been feeling like I might snap » - **F3** « I want to have my favorite food/drinks » (.09) → **desire** dimension

### 4 negative correlations between BITe items and DARS items

- **B2** « I have been feeling like I might snap » - **S4** « I would actively participate in my favorite social activities » (estimate : -.13) → **effort** dimension
- **B5** « I have been feeling irritable » - **F1** « I would make an effort to get my favorite food/drinks » (-.09) → **effort** dimension
- **B5** « I have been feeling irritable » - **H2** « I would spend time doing my favorite activities » (-.07) → **effort** dimension
- **B5** « I have been feeling irritable » - **H1** « I would enjoy my favorite activities » (-.07) → **pleasure** dimension

## Discussion

- **Irritability** was linked to
  - an **increased desire** for **food and drinks** but,
  - **less willingness to expand effort** for **social activities, non-social hobbies** and **food/drinks**
  - **less consummatory pleasure** for **non-social hobbies**
- These results suggest that irritability and anhedonia are mostly related through **an impairment of the effort facet** of the hedonic response.
- This data analysis method could identify unique symptom profiles, which could improve treatment strategies. Combining experimental paradigms with EEG or fMRI data collection enables an in-depth analysis of the association between anhedonia and irritability.