

# A Network Analysis of the Relationship between Irritability and Anhedonia Symptoms

Sonia Sistiaga<sup>1</sup>, Mandy Rossignol<sup>1</sup>, Nellia Bellaert<sup>1,2</sup>

<sup>1</sup> Cognitive Psychology and Neuropsychology Department, University of Mons, Belgium

<sup>2</sup> Yale Child Study Center, Yale School of Medicine, Yale University, New Haven CT, U.S.A.

## Introduction

- **Irritability and anhedonia** are common symptoms of major depressive disorder (MDD) that are associated with greater depression severity and poor longitudinal 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).

## Aim

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

## Methodology

### Participants (N = 422)

- 32.60 years of age ( $SD = 14.38$ ) ; 82.20% females
- Exclusion criteria : past or current drug/alcohol dependence, medical, or psychiatric ( $\neq$  depression/anxiety) condition.

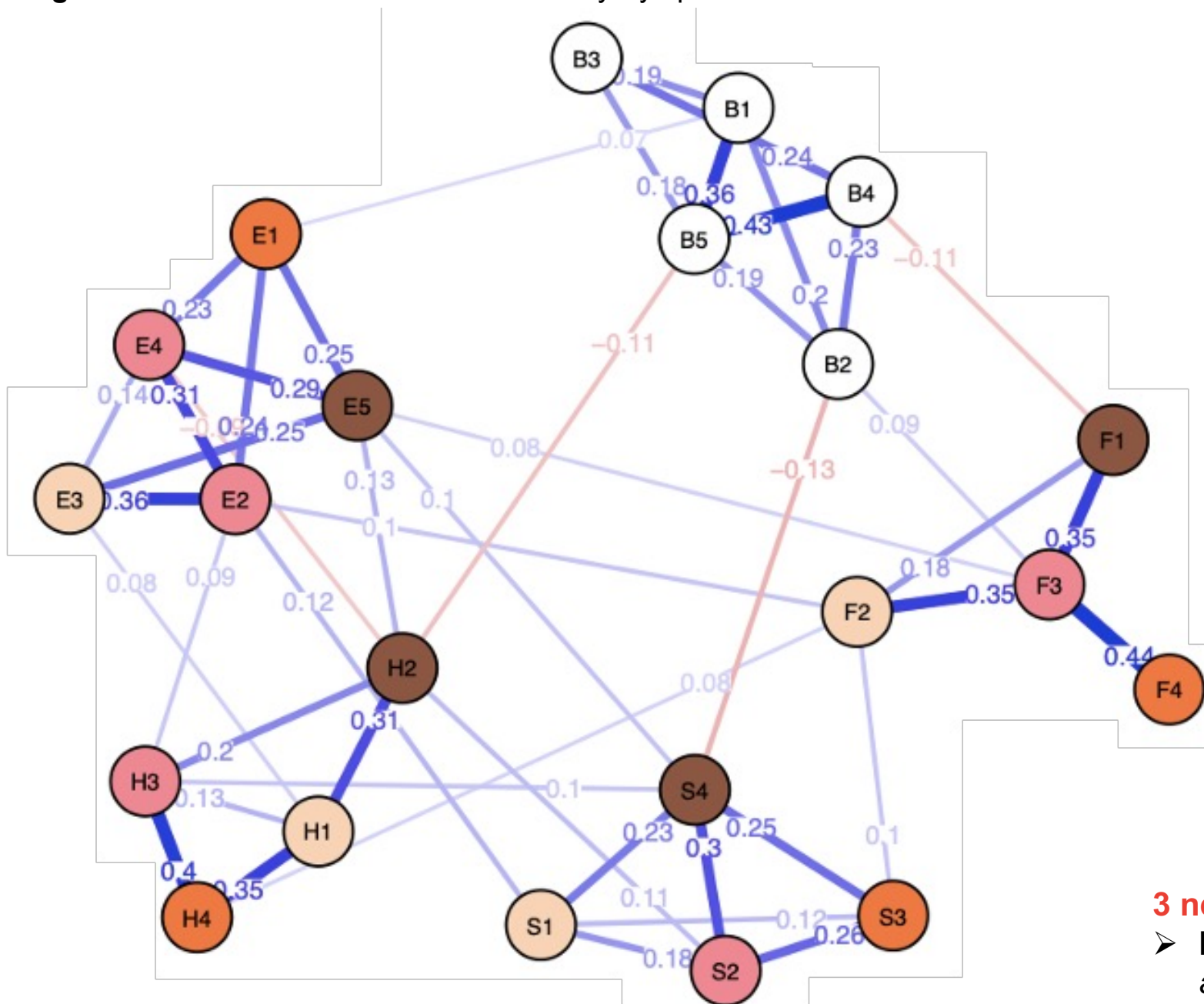
### Questionnaires (completed in an online survey)

- 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

### 2 positive correlations between BITe items and DARS items

- **B1** « I have been grumpy » - **E1** « I would actively seek out my favourite sensory experiences » (estimate : .07) → **motivation** dimension
- **B2** « I have been feeling like I might snap » - **F3** « I want to have these foods/drinks » (.09) → **desire** dimension

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

- **B2** « I have been feeling like I might snap » - **S4** « I would actively participate in my favourite social activities » (estimate : -.13) → **effort** dimension
- **B5** « I have been feeling irritable » - **H2** « I would spend time doing my favourite activities » (-.11) → **effort** dimension
- **B4** « Things have been bothering me more than they normally do » - **F1** « I would make an effort to get/make my favourite foods/drinks » (-.11) → **effort** dimension

## Discussion

- **Irritability** was linked to
  - an increased **motivation and desire** to feel sensory experiences, but
  - **less willingness to expand effort** to engage in social activities and hobbies.
- These results suggest that irritability and anhedonia are mostly related through an impairment of the **effort** facet of the hedonic response. In other words, highly irritable individuals may be less willing to expand effort to obtain rewards, while the other hedonic dimensions may still be preserved.
- This method of data analysis could identify unique symptom profiles, which could improve treatment strategies. Experimental paradigms coupled with data collection methods, such as EEG or fMRI, could allow an in-depth analysis of the links between anhedonia and irritability.