Wivine Blekic[1], Kendra Kandana Arachchige[1], Erika Wauthia[1,2], Pierre Maurage[3], Mandy Rossignol[1].

Neural mechanisms of encoding and maintenance of emotional faces in social anxiety disorder : An ERP study with an N-back task

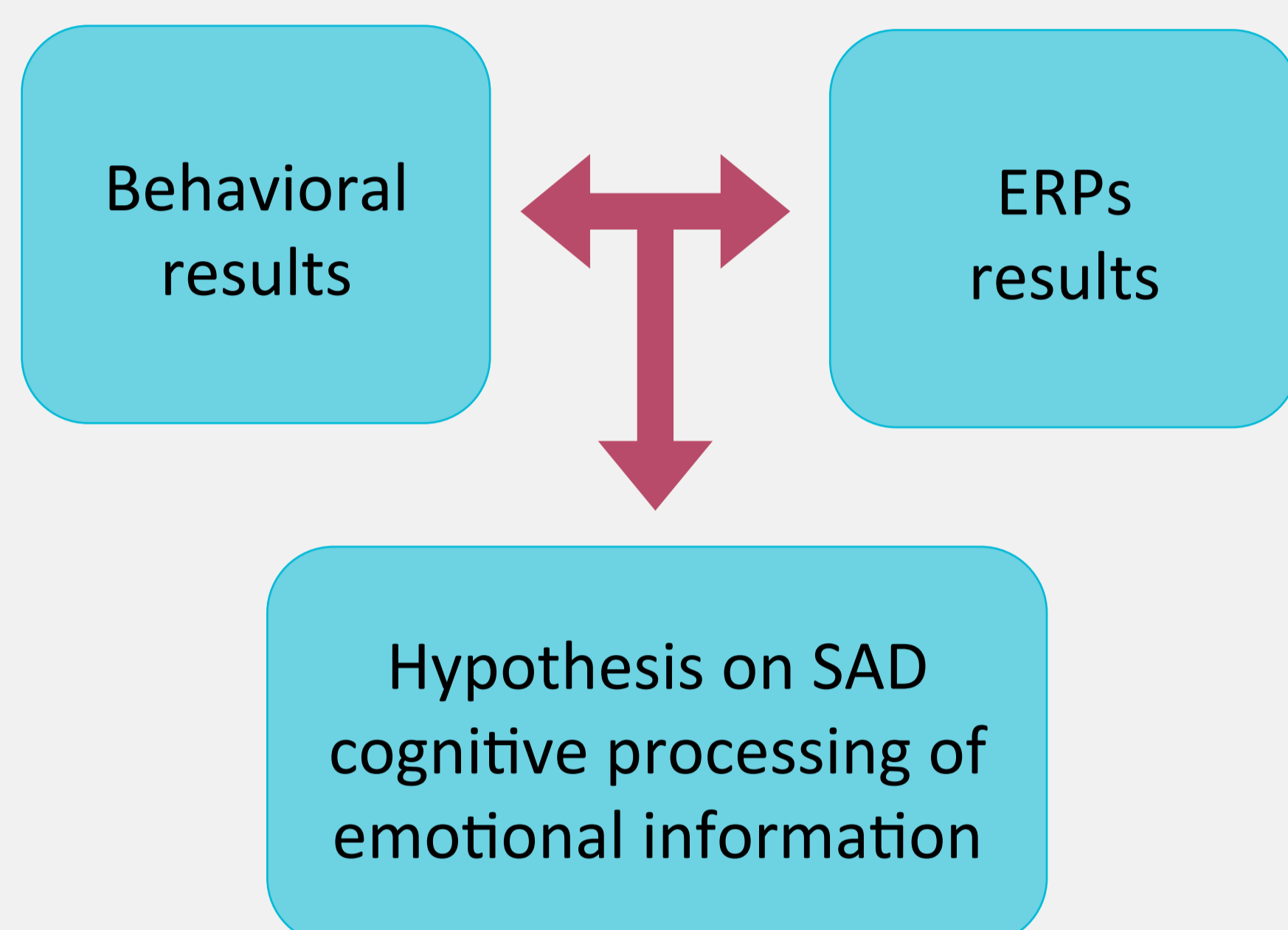[1.]Service de Psychologie Cognitive et Neuropsychologie, Université de Mons.
[2.]Fonds pour la recherche Recherche en Sciences Humaines (FRESH), Belgium
[3.]Laboratoire de Psychopathologie Expérimentale, Université Catholique de Louvain.

1. Introduction

- Social anxiety disorder (SAD) is associated with an attentional bias (engaging or disengaging process) for threatening information, which could modulate memory stages.

- Event Related Potentials (ERPs) studies can provide a better understanding of the nature and behavioural impact of this attentional bias.
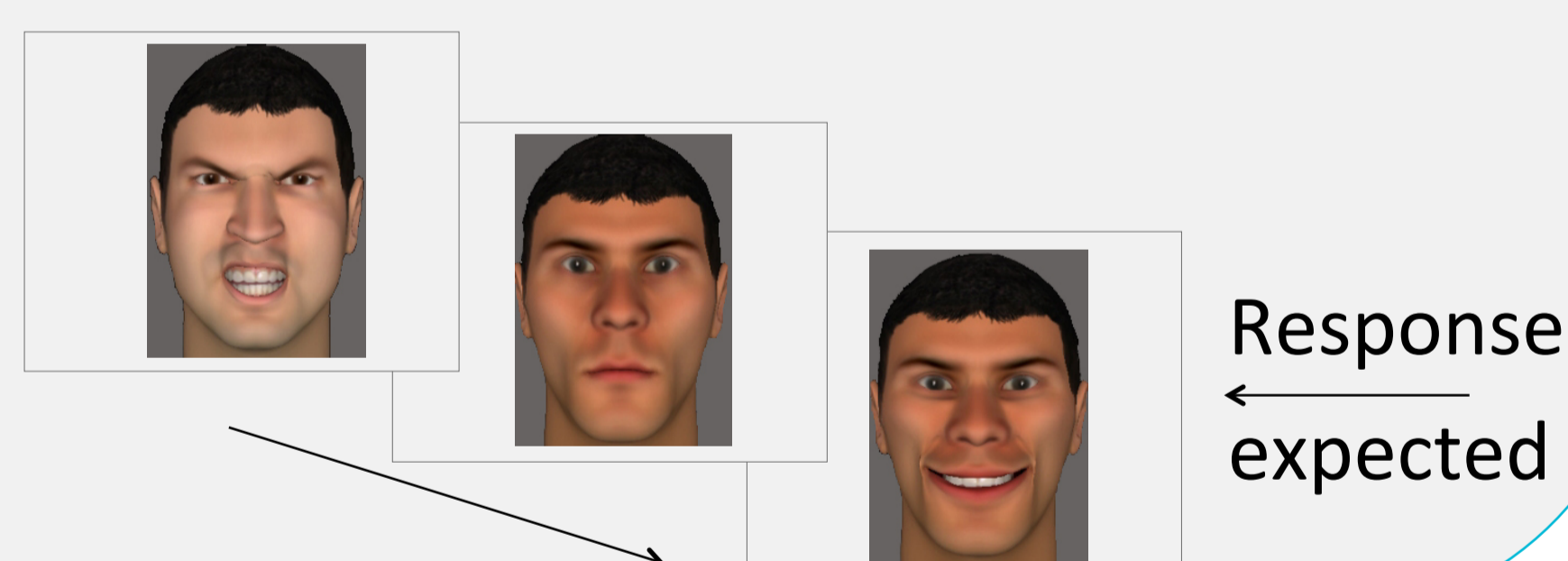
2. Aims

Behavioral results ⟷ ERPs results

Hypothesis on SAD cognitive processing of emotional information

3. Population

48 subjects :
- 24 subjects SAD;
- 24 control subjects : CNTR

Test	SAD	CNTR	Sig.
LSAS	91.68	33.96	P <0.011
Age	20.08	20.56	P <0.001
Sex	13 ♀ 12 ♂	13 ♀ 12 ♂	X^2 <0.000

4. Methodology

- N-Back task :
  - Three loads (0Back, 1Back, 2Back);
  - Three different faces (X, Y, Z);
  - Three different emotions (anger, joy, neutral);

- Two conditions:
  - « Emotion » (the target stimulus is a facial emotion);
  - « Identity » (the target stimulus is the identity of the face showed, despite of its emotion). Example :

ISI = 1000 ms
Presentation time = 500 ms

Response expected
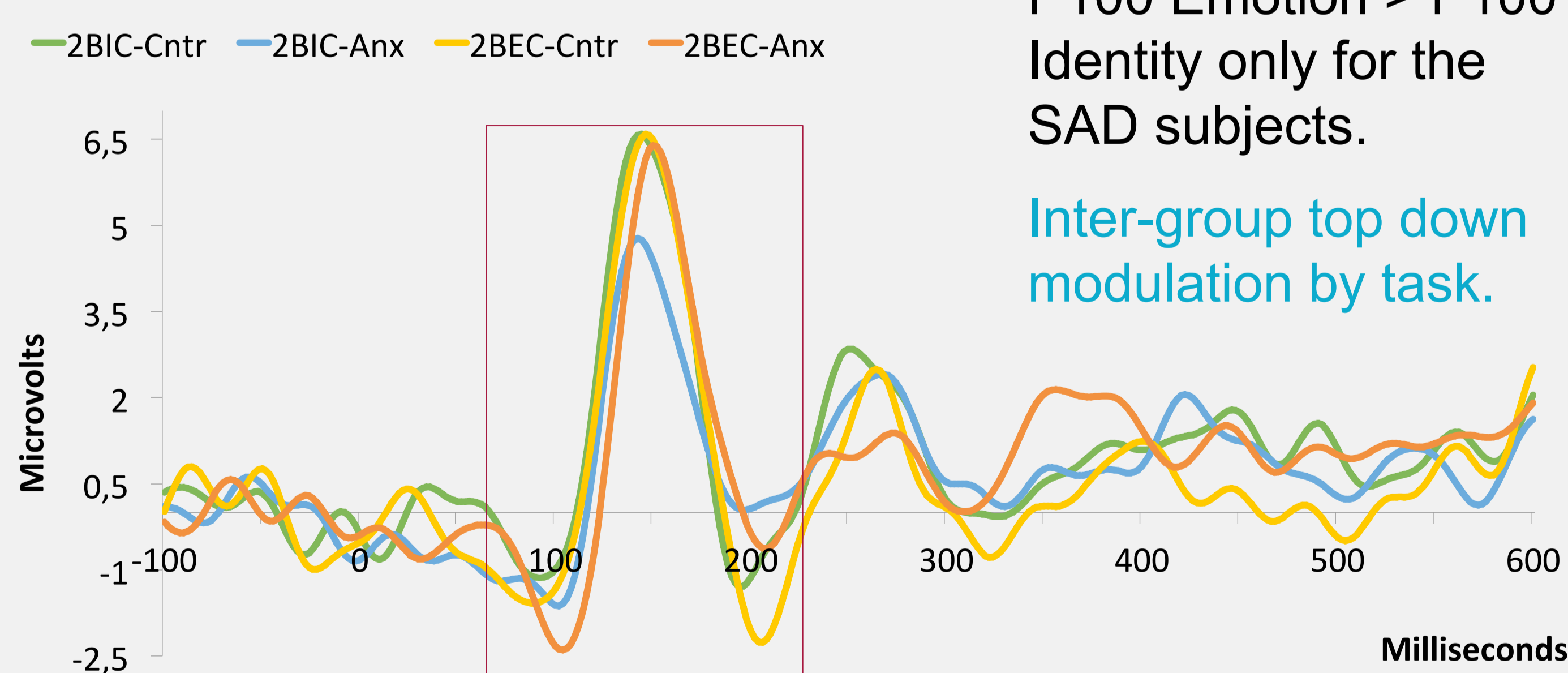
5. Results

Group*Emotion on reaction time
$F (2,90) = 2.925; p = 0.059$

- RT CNTR > RT SAD;
- In SAD group : RT anger > RT Joy and neutral

Bottom up modulations :
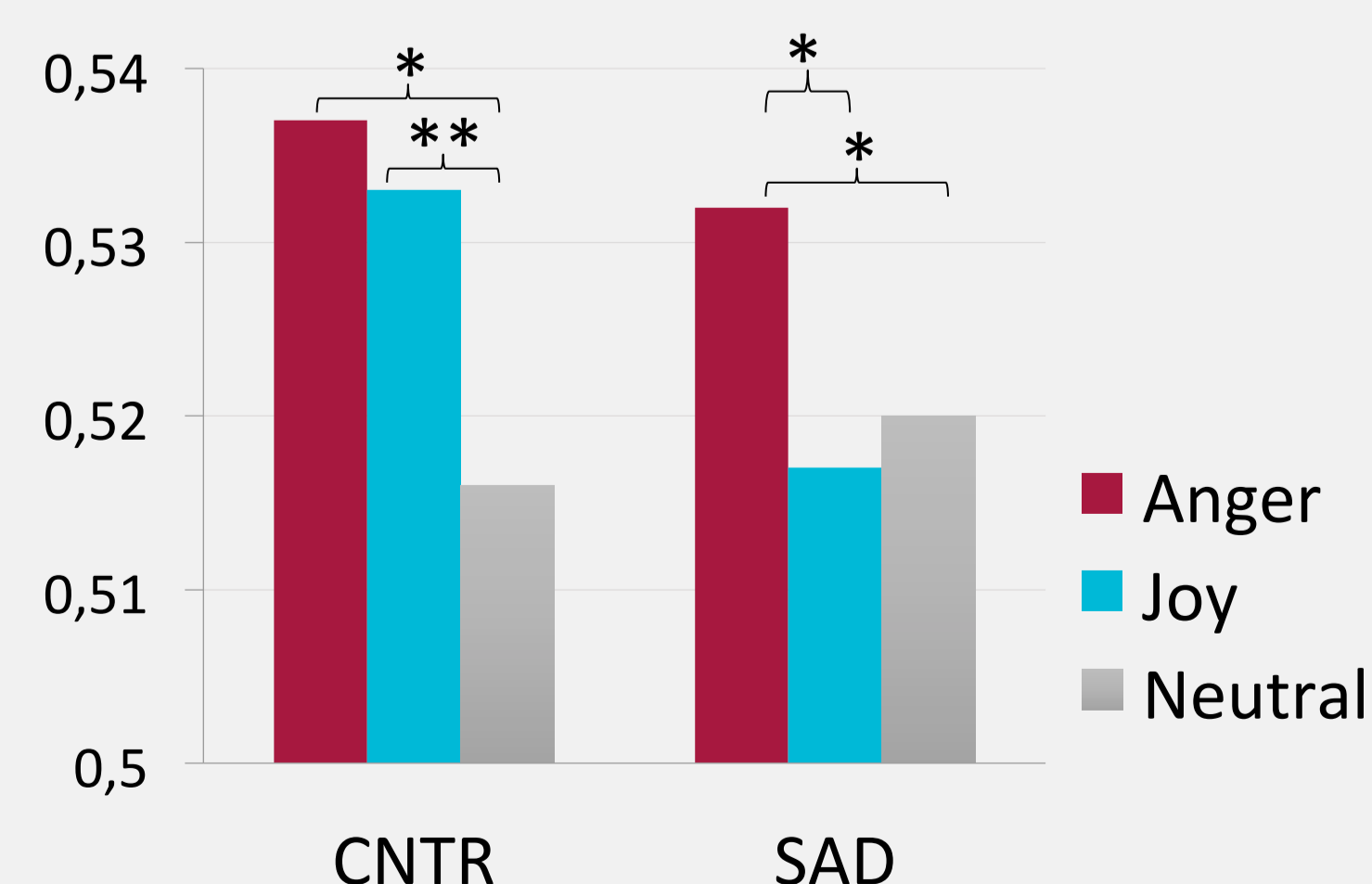- Intra-group by group
- Inter-group (SAD) by emotion

Task*Group on P100 amplitude (Oz)
$F(1,25) = 6.313; p = 0.019$

Legend: 2BIC-Cntr, 2BIC-Anx, 2BEC-Cntr, 2BEC-Anx
Microvolts / Milliseconds

P100 Emotion > P100 Identity only for the SAD subjects.

Inter-group top down modulation by task.

Group*Emotion on LPP latency
$F (2,50) = 6.862; p = 0.005$

Legend: Anger, Joy, Neutral — CNTR, SAD

- Neutral ≠ from others in the CNTR group;
- Anger ≠ from others in the SAD group.

Intra-group bottom up modulation by emotion.

6. Discussion

The SAD group present a **modulation of early stages of the visual processing :**
- Larger P100 in SAD group for emotional condition = deeper visual processing for emotional information (Rossignol & al. 2012).
  → Top-down modulation by emotion : SAD subjects allocate more attentional resources to encode emotional information;

Attentional bias in SAD group = **bottom-up modulation by angry faces** (AF) :
- Larger LPP for AF = more sustained attention for those targets; and slower RT for AF;
- SAD subjects could need more time to disengage their attention from AF and start the behavioural response.

Bibliography
- M.Rossignol, S. Campanella, P. Maurage, A. Heeren, L. Falbo, P. Philippot. (2012). Enhanced perceptual responses during visual processing of facial stimuli in young socially anxious individuals. *Neurosciences Letters* 526 (1), 68-73.