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EFFECT OF DEPRESSION ON THE OCULOMOTOR INHIBITION IN A NON-CLINICAL SAMPLE

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I. Introduction

- Cognitive biases have been highlighted in depression **impairing inhibition abilities** (Joormann & Gotlib, 2010).
- The aim of the study was to evaluate **oculomotor inhibition**, which is defined as a **suppression of reflexive saccades** toward peripheral cues (Nigg, 2000).
- To measure such processes, authors have developed an **anti-saccade paradigm** (Cherkasova *et al.*, 2002).
- The present study adapted this task with **emotional information** to assess oculomotor inhibition in depression.

II. Hypotheses

2 main assumptions:

- H1 – **Anti-saccade task** would result in longer reaction times (RT) and reduced correct answer rates (CA) → Involvement of disengagement processes.
- H2 – **Higher level of depression** would reduce general efficiency and specifically affect disengagement abilities.

Participants

**118** STUDENTS > 19 ♂ / 99 ♀ / M = 19.84 > SD=1.73

Measures

INVENTORIES
- **Depression level** (Q25-Q75 > 3 groups)
- **Rumination level**
- **Anxiety level**

→ **BDI-13** – Beck Depression Inventory (Beck & Beadmesdefer, 1974, 1987)
→ **ATQ** – Automatic thoughs Questionnaire (Hollon & Kendall, 1980)
→ **STAI** – State and Trait Anxiety Inventory (Spielberger *et al.*, 1983)

Depression Level	BDI M (SD)	ATQ M (SD)	STAI-State M (SD)	STAI-Trait M (SD)
Low gr.	1.41 (.73)	38.72 (5.40)	47,62 (10,54)	45,45 (6.21)
Medium gr.	4.46 (1.14)	44.12 (10.39)	48.94 (9.82)	49.47 (9.53)
High gr.	9.83 (2.93)	63.53 (19.17)	59.56 (10.65)	58.22 (6.27)

III Method - ATTENTIONAL ENGAGEMENT & DISENGAGEMENT ASSESSMENT

PRO-Saccade (PS)

ANTI-Saccade (AS)

1600ms
Cue 600ms
Target 100ms
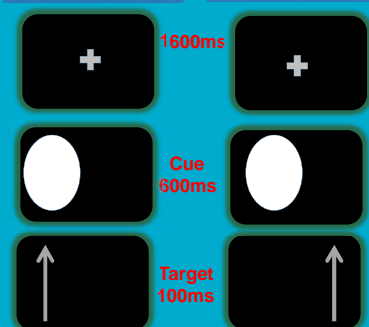
ANTI-SACCADE TASK: measure of cognitive inhibition (control deficit) in which participants have to suppress a reflexive saccade towards a peripheral stimulus and generate a volitional saccade in the opposite direction.

STIMULI TYPE

No emotion
(1) Positive
(2) Negative
(3) Neutral

Social emotion
Joy, Surprise(1)
Anger, Disgust(2)
No expression(3)

Non-social emotion
Butterfly, Ladybug(1)
Spider, Snake(2)
Tree leaf(3)

ENGAGEMENT
Focus your attention toward the cue.

DISENGAGEMENT
Focus your attention away from the cue.

CA   **ANSWERS RECORDING**   RT

And decide the orientation (up/down) of the arrow appearing immediately after the cue.

IV. Results

H1 confirmed

- **Main task effect (CA):**
For all participants, **AS task > PS task**.
$F(1,114)=18.959$, p<.000, partial $\eta^2=.143$.
- **Main stimuli-type effect (CA, RT):**
CA – For all participants, **Social errors < Non-social errors**.
$F(1,114)=40.492$, p<.000, partial $\eta^2=.262$.
RT – For all participants, **Social RT < Non-Social RT**.
$F(1,115)=10.244$, p=.002, partial $\eta^2=.082$.
- **Task*Stimuli-type interaction (RT) - (Fig. 1):**
In PS condition, **Social RT < Non-Social RT**.
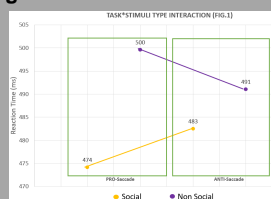In AS condition, **Social RT > Non-Social RT**.

V. Discussion

- Attention is easily engaged in pro-saccade condition, when the location of the target is activated (top-down attentional control).
- The slowing effect on non-social cues engagement and disengagement difficulties toward social cues (bottom-up automatic processing) might be attributed to the more pronounced salience and relevance of human faces (Wild et al., 2001).
- Higher level of depression have a global slowing effect that may be interpreted in terms of motivational deficits (Eliot, 2006).
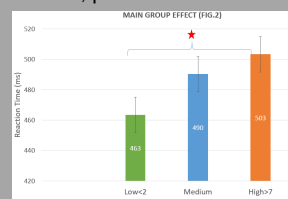- ➔ Limitations of the study:
- Anxiety comorbidity,
- Non-clinical sample
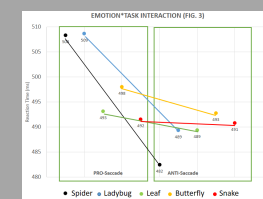- More females than males.

H2 confirmed

- **Main group effect (CA, RT):**
CA – High BDI errors > Low/Medium BDI errors, $F(2,114)=3.261$, p=.042, partial $\eta^2=.054$.
RT – High BDI RT > Low/Medium BDI errors, $F(2,115)=3.309$, p=.040, partial $\eta^2=.054$, **(Fig.2)**
- **Emotion*Task interaction (CA, RT):**
In social condition => CA – **AS errors > PS errors**, $F(4,112)=16.961$, p<.000, partial $\eta^2=.130$.
In non social condition => CA – PS errors < AS errors, for **Spiders**, t(116)= 2.031, p=.045, and **Ladybugs,** t(116)=7.669, p.000**. => RT – PS RT < AS RT**, for **Spiders**, t(117)= 3.678, p<.000 and **Ladybugs**, t(117)= 3.678, p<.000, **(Fig.3)**
- **Emotion*Task*Group interaction (CA):** Only in Low BDI, $F(4,112)=2.707$, p=.034, partial $\eta^2 =.088$.
In the AS condition, main effect of emotion, $F(4,112)=2.137$, p=.081, partial $\eta^2 =.071$.
Disgust faces errors > Neutral faces errors, p=.082.

TASK*STIMULI TYPE INTERACTION [FIG.1]
$F(1,115)=15.443$, p=.002, partial $\eta^2=.118$

MAIN GROUP EFFECT [FIG.2]
$F(2,115)=3.309$, p=.040, partial $\eta^2=.054$

EMOTION*TASK INTERACTION (FIG. 3)
$F(4,112)=4.846$, p=.001, partial $\eta^2=.148$

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