“What about prevention?” – Training cognitive control to reduce stress reactivity and rumination

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Disclosures

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  - We have nothing to disclose
Design

**PRE-SCREENING**
- RRS-NL-EXT

**BASELINE**
- Self-report
- Working memory

**TRAINING**
- Adaptive PASAT
- Adaptive Visual Search task (control group)

**POST-TRAINING**
- Self-report
- Working memory
- Stress reactivity & rumination in lab

**FOLLOW-UP**
- Response to naturalistic stress (self-report)

(Hoorelbeke, Koster, Vanderhasselt, Callewaert, & Demeyer, in press; BRaT)
PRE-SCREENING
• Undergraduate students
• “At-risk”

→ Heightened trait rumination (≥ pct. 70)
BASELINE

- BDI-II, MASQ-D30, RRS, PSWQ, RS, ACS, PANAS
- Automated Operation Span task (O-Span)
  - Complex span task
  - Letters
  - O-Span score
**TRAINING**

- randomized
- online
- 10 sessions within 14 days
- CCT or a non-working memory related training
- < 20 min.
POST-TRAINING

- Stress reactivity

- Stress induction procedure (Rossi & Pourtois, 2012)
  - visual oddball task
  - fictive norms of 42 students
  - feedback remains negative while block difficulty decreases
Breathing Focus task → VAS - Positive affect - Negative affect → Stress induction task → VAS - Positive affect - Negative affect → Breathing Focus task

Adaptive PASAT

Self-report
Working memory

Adaptive Visual Search task (control group)

Self-report
Working memory
Stress reactivity in lab

Response to naturalistic stress (self-report)

POST-TRAINING

RRS-NL-EXT

Self-report
Working memory
Follow-up:

- 4 weeks follow-up
- Online assessment
- Brooding
- Examination period
Hypotheses

(1) CCT $\rightarrow$ stress reactivity in lab context
   - mood
   - ruminative thinking

(2) CCT $\rightarrow$ brooding in response to a naturalistic stressor
Results
Participants

- $N = 53$, 47 completed the training, 37 responded to the follow-up call
- At risk undergraduate students

<table>
<thead>
<tr>
<th>Training condition</th>
<th>CCT</th>
<th>Sham</th>
</tr>
</thead>
<tbody>
<tr>
<td>N</td>
<td>25 (FU: 20)</td>
<td>22 (FU: 17)</td>
</tr>
<tr>
<td>Age</td>
<td>20.80</td>
<td>20.50</td>
</tr>
<tr>
<td>Gender (F/M)</td>
<td>(25/0)</td>
<td>(18/4)</td>
</tr>
</tbody>
</table>

- Self-report measures: no pre-test group differences
- Both groups: increase in functioning on the training tasks over time
Results – Manipulation check: Working Memory Functioning?

2 (Between: Condition) x 2 (Time: Pre-Post) Mixed ANOVA

→ Main effect of Time: $F(1, 45) = 19.66, p < .001, \eta^2 = .30$

But no Time x Condition interaction: $F(1, 45) = 0.51, p = .48, \eta^2 = .01$

However, in CCT:

$\Delta$ WM functioning $\sim \Delta$ brooding

$\Delta$ resilience
Results – Hypothesis 1: CCT = stress reactivity (lab)

2 (Between: Condition) x 2 (Time: Pre-Post) Mixed ANOVA’s
Results – Hypothesis 2: CCT = \rightarrow brooding (naturalistic stressor)

2 (Between: Condition) x 2 (Time: Pre-Post) Mixed ANOVA covariate: time since previous exam

+ CCT: reduced stress reactivity in lab (T2) \rightarrow lower brooding following naturalistic stressor (T3)
Discussion

_CCT can be used to ..._

1. decrease stress reactivity in at risk students

2. decrease brooding in response to a naturalistic stressor

= decrease vulnerability for depressive symptomatology?

(Hoorelbeke, Koster et al., in press; BRaT)
Thank you for your attention!

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