PROACTIVE AND REACTIVE INHIBITORY CONTROL IN EATING DISORDERS

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Inhibitory control is:

- The ability to withhold inappropriate and unwanted behaviour
- Implicated as altered in eating disorders

(Berner and Marsh, 2014; Thamotharan et al., 2013; Wierenga et al., 2014)

- A multi-faceted construct with different types of inhibitory control

(Brooks et al., 2012)
DEFINITIONS

**REACTIVE:** Withholding a response in reaction to a external cue

**PROACTIVE:** Anticipatory withholding of a behaviour in context of uncertainty or goal-attainment
STUDY AIMS

• To examine the status of proactive and reactive inhibitory control in across the eating disorder ‘spectrum’

• Consider the role of intolerance of uncertainty
METHOD

• 94 adult women
  • 28 AN, 27 BN, 11 BED, 28 HC
• Completed 2 computer tasks and self-report scale
  • Stop signal task → Reactive & proactive inhibition
  • Cued reaction time task → Proactive inhibition
  • Self-report: Intolerance of uncertainty scale
ED EXPERIENCE GREATER INTOLERANCE OF UNCERTAINTY THAN HC

All $p<0.001$
STOP SIGNAL TASK PROCEDURE
STOP SIGNAL TASK PROCEDURE
STOP SIGNAL TASK TO ASSESS REACTIVE INHIBITION

- Four blocks: 0% stops, 15% stops, 25% stops, 35% stops
- Varied stop signal delay (SSD) $\to$ 50% accuracy
- Stop signal reaction time (SSRT) indexes the ‘speed of stopping’ as function of mean RT and SSD

(Verbruggen et al., 2008)
REACTIVE INHIBITION: NO GROUP DIFFERENCES

• No difference in SSRT between groups

• Consistent with majority of previous studies
  (e.g. see reviews Bartholdy et al., 2016; Van den Eynde et al., 2011)
STOP SIGNAL TASK TO ASSESS PROACTIVE INHIBITION

- Four blocks: 0% stops, 15% stops, 25% stops, 35% stops
- Varied stop signal delay (SSD) → 50% accuracy
- Strategy indexed by stop accuracy and reaction time
GROUP PATTERNS IN STRATEGIC PROACTIVE INHIBITION

Stop accuracy

Mean reaction time on ‘go’ trials

People with AN act more cautiously in the SSRT
CUED REACTION TIME TASK
PROCEDURE
CUED REACTION TIME TASK
PROCEDURE

[Diagram showing a yellow circle and a blank square with arrows indicating movement directions]
CUED REACTION TIME TASK
PROCEDURE
CUED REACTION TIME TASK
PROCEDURE

• Varied warning-target time delay: pure block, 100ms, 300ms, 500ms
• Metric: The speed of releasing inhibited action
EVIDENCE FOR TONIC SUPPRESSION OF MOTOR RESPONSE

- All groups performed best when they had more time to disinhibit
AN SHOW GREATER PROACTIVE SLOWING THAN HC WOMEN

- All groups performed best when they had more time to disinhibit.
- Significant main effect of group when controlling for intolerance of uncertainty.
SUMMARY

**SSRT task**
- Reactive inhibition: No group differences observed
- Strategic proactive inhibition: Patterns suggest greater in AN and poorer in BN/BED

**Cued reaction time task**
- Proactive inhibitive under uncertainty: Slower release of inhibited action in AN than HC
CONCLUSIONS

Inhibitory control differs across the disorders
- Model seems to refer to proactive inhibition
- AN: Perfectionism (Lloyd et al., 2014) & Accuracy preference (Sternheim et al., 2011)
- BN/BED: Increased impulsivity (Sysko et al., 2017)

Contribution of inhibitory control to psychopathology
- May explain some clinical observations
- E.g. inhibited temperament & avoidant behaviours in AN, inability to resist in BN/BED

Potential target for treatment
- Manipulating proactive inhibition promising?
- Implications for behavioural training interventions
- Disorder-specific efficacy
FUTURE WORK

1. INTRA-DIAGNOSTIC DIFFERENTIATION
   E.g. difference in inhibitory control between AN-R and AN-BP

2. A ROLE FOR CBT IN INHIBITORY CONTROL?
   Exploring the impact of less anxiety around uncertainty on proactive inhibition

3. REPRODUCE IN LARGER SAMPLE SIZES
   To benefit from increased statistical power and external validity
THANK YOU FOR LISTENING!

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[Logos of King’s College London, Medical Research Council, and National Institute for Health Research Biomedical Research Council]