The Neuroscience of Mindfulness

Mindful Attention in the Brain

Tina Forster & Hana Villar, 12th June 2015
Self-regulation theory of mindfulness

Diagram:
- Emotion Regulation
- Body Awareness
- Attention Regulation
- Perspective on the Self
Attention

“...is the taking possession of the mind, in clear and vivid form, of one out of what may seem several simultaneously possible objects or trains of thoughts...It implies withdrawal from some things in order to deal effectively with others.”

“The faculty of voluntarily bringing back a wondering attention over and over again, is the very root of judgment, character and will”

(William James, 1890)
Attention
Mindful Attention
Mindfulness & Attention

- Experiential practices ranging from few minutes to the standardised 8-week programme (MBSR/MBCT)

- Aim:
  - Moment-by-moment, non-evaluative, simultaneous attentiveness to internal & external experience

- Tool: Body Focus
  - noticing the breath
  - body scan
  - mindful sitting and movement
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(e.g. Schmidt et al., 2014 on touch imagery)
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Study:
- Randomised control trial (n=58)
- 8 week MBSR and control group (waitlist; no training)
- Measures:
  - General Mental Health questionnaire; Five Facet Mindfulness Questionnaire (FFMQ)
  - Heart beat task; attentional orienting task; sustained attention task
  - EEG
- Measurement time points:
  - Questionnaires: pre, mid and post MBSR (controls: 0, 5, 9 weeks)
  - Task + EEG: pre and post MBSR
FFMQ body awareness items are, for example:
- ‘when I’m walking, I deliberately notice the sensation of my body moving’
- ‘I notice how foods and drinks affect my thoughts, bodily sensations, and emotions’

Clear effect of MBSR on body awareness and perception: increased rating of body items
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Sustained attention task: count tones or count touch:

Clear effect of MBSR on body awareness and perception: increase accuracy of counting touch

* P ≤ 0.03

accuracy

Pre Post

TAC AUD
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Sustained attention task: count tones or count touch:

- Touch attended (pre)
- Touch attended (post)
- Touch unattended (pre)
- Touch unattended (post)

Touch on one of the hands

**μV**

- N20
- P50
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Sustained attention task: count tones or count touch:

TOUCH
Touch attended (pre)
Touch attended (post)
Touch unattended (pre)
Touch unattended (post)

TONES
Tones attended (pre)
Tones attended (post)
Tones unattended (pre)
Tones unattended (post)

Touch on one of the hands

Start of tone
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Sustained attention task: count tones or count touch:

Clear effect of MBSR on body awareness and perception: increase brain activity for attended/counted touch
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Sustained attention task: count tones or count touch:

- Increase brain activity for attended/counted touch after MBSR
- Timing of this effect suggests change in the reply of information from thalamus (‘brain’s gate keeper’) to body representation area
- Specific to touch (as not present with tones)
- Early marker of mindful attention?
- How does this generalize to general attention, awareness and emotion effects?
- Contribution of different mindfulness exercises

(Kerr, 2013)
Thank you for your Attention!