Effects of Mindfulness-Based Cognitive Therapy on the experience of positive emotions in daily life: A randomized controlled trial

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Overview

• Positive emotions, why bother?
• Experience Sampling Method
• Mindfulness-Based Cognitive Therapy
• MindMaastricht trial
• Results
• Conclusion
Introduction: Positive Emotions

- Associated with longevity and health

- Positive and negative emotions = different subsystems

(Cohn & Fredrickson, 2009; Geschwind, 2011)
Emotions

- Negative emotions
- Positive Emotions

intensity

time
Experience Sampling Method

- At random
- 10 times per day
- 6 days

Right now, I feel...

<table>
<thead>
<tr>
<th></th>
<th>not at all</th>
<th>moderately</th>
<th>very</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cheerful</td>
<td>1  2  3  4  5  6  7</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Anxious</td>
<td>1  2  3  4  5  6  7</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Daily life person-context interaction

Experience sampling procedure

Day 1  Day 2  Day 3  Day 4  Day 5  Day 6

7.30  beep  beep  beep  beep  beep  beep  beep  beep  beep  22.30

one ESM day

Positive emotions

Activity Pleasantness

Daily-life context
Daily-Life Reward Experience

Positive emotions

Daily life
How to increase positive emotions?

Attentional broadening

Positive emotions

Reward
Mindfulness-Based Cognitive Therapy

- 8 week training, 10-15 participants
- In touch with and aware of the present moment
- Non-evaluative and non-judgmental
- Daily homework: attention exercises
MindMaastricht RCT

- Sample: 130 participants with residual symptoms of depression, not currently depressed
Positive emotions

- Happy
- Satisfied
- Strong
- Enthusiastic
- Curious
- Animated
- Inspired
- [Relaxed]

alpha = 0.89
Pleasantness of current activity

- I enjoy this activity
- I am skilled at doing this
- This activity requires effort
- I would prefer to do s.th. else
- [I feel I’m being active]
- [This is a challenge]
## Results

<table>
<thead>
<tr>
<th>Total Entries</th>
<th>Invalid</th>
<th>Participants</th>
<th>Entries per participant</th>
</tr>
</thead>
<tbody>
<tr>
<td>12,453</td>
<td>559 (4 %)</td>
<td>130; 1 excluded</td>
<td>49 (SD 7.6)</td>
</tr>
</tbody>
</table>
After mindfulness training...

- More positive emotions
- Activities appraised as more pleasant
Also: Increased reward experience

Positive emotions vs. Daily life

Before vs. After
PA change

![Graph showing PA change between CONTROL and MBCT groups. The graph indicates a significant increase in MBCT post-intervention compared to pre-intervention, as indicated by the asterisks (** and ***).]
Activity pleasantness change

pre        post

CONTROL    MBCT
Reward Experience change

pre

post

CONTROL

MBCT
Increases in positive emotions
Related to reduction in residual symptoms?

Reduction in residual symptoms

pre  post
Related to reduction in residual symptoms?
Related to reduction in residual symptoms?
But...

- Original idea behind MBCT: learn to disengage from automatic negative thinking patterns that arise during dysphoric mood and facilitate relapse (Teasdale, 2000)

- So: Ruminations, worry, NA $\rightarrow$ PA etc.? (crossed out)

- Independent of changes in rumination, worry, NA, and stress sensitivity
Conclusions

• Reward experience can be learned

• Living in the moment
  → more receptive
  → higher experience of positive emotions during pleasant activities

• More research necessary underlying mechanisms!
Conclusions

• MBCT has another, less often studied face: it facilitates the experience of positive emotions.

• Changes in PA-related variables possibly contribute to the protective effects of MBCT against future relapse.
Thanks to:

Marieke Wichers

Frenk Peeters

Jim van Os

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References


- Wichers et al. (2009). Reduced stress-sensitivity or increased reward experience: The psychological mechanism of response to antidepressant medication. *Neuropsychopharmacology, 34,* 923-931.


- Wichers, Geschwind et al. (2010). Scars in depression: is a conceptual shift necessary to solve the puzzle? *Psychological Medicine, 40(3),* 359-365.
Introduction: Positive Affect (PA)

• PA reduces stress-induced psychiatric and physiological symptoms
• PA also reduces the expression of genetic vulnerability for affective disorders
• Effects PA > NA on resilience & well-being (Cohn & Fredrickson, 2009)
• → PA preserves, and possibly improves, mental health.
Activity-related reward experience

Increase in Positive Affect

Responders | Nonresponders | Responders | Nonresponders
Mindfulness | Control

pre | post

[Graph showing the increase in positive affect for responders and nonresponders in the Mindfulness and Control groups, with error bars indicating variability.]
Activity-related stress sensitivity

Increase in Negative Affect

Responders | Nonresponders | Responders | Nonresponders

Mindfulness | Control

Graph showing the comparison of increase in negative affect between responders and nonresponders in Mindfulness and Control groups, pre- and post-intervention.
NA change pre/post: Mindfulness vs. Controls
Maastricht
Measuring emotions in daily life?

- NA and PA fluctuate...
Method

• 49 depressed patients (randomized to Imipramine or placebo)

Week 1

• HAM early improvement
• PA early change
• NA early change

Week 6:

• HAM score
• Remission
• Recovery
Reward Experience & Resilience

- High reward experience should contribute to the preservation of mental health
  - Especially when at risk for low mood
    - Childhood trauma
    - Recent Stressful Life Events
    - Genetic Risk
Differential relapse prevention effect

• Finding: MBCT reduces relapse only in 3+ patients, not in 2- (Teasdale et al., 2000; Ma & Teasdale, 2004)

• Assumptions:
  1) MBCT works mainly via cognitive processes (Rumination, meta-cognition)
  2) Automatic negative thinking patterns stronger and more related to relapse in 3+

• Consequence: Most studies exclude 2-
Differential relapse prevention effect

- (Teasdale et al., 2000; Ma & Teasdale, 2004)
Assumptions

1) MBCT works mainly via cognitive processes (rumination, meta-cognition)

2) Automatic negative thinking patterns stronger and more related to relapse in 3+
Consequence

- Most later studies excluded 2- patients:
  - Bondolfi, et al., 2010; Godfrin & van Heeringen, 2010; Kuyken, et al., 2008; Kuyken, et al., 2010; Segal, et al., 2010

- Even when not directly examining risk for relapse:
  - Barnhofer, et al., 2009; Hargus et al., 2010; Kingston et al., 2007
Exclusion justified?

- Arguments against exclusion:
  - Subpopulation overlap argument
  - Diversity argument
  - Continuity argument
  - Confounder argument
Subpopulation overlap argument
Diversity Argument (1)

• Diverse effects:
  – Changes in emotion regulation:
    • Positive emotions increase (Geschwind et al, submitted; Fredrickson et al., 2008)
    • Upward spiral (Garland et al, 2010)
    • Related to reduction of dep. symptoms
  – Various other reported effects → works on more basal level
Diversity Argument (2)

• Beneficial for diverse populations not suffering from major depression
  • working people, cancer, pregnancy, anxiety, ...

![Graph showing effectiveness vs depression severity]

- No dep
- 2-
- 3+
Continuity Argument (1)

• Relapse = dichotomous
• Evidence for continuity of symptoms
• Problems with dichotomous classifications
• ➔ Useful to examine continuous measures
Continuity Argument (2)

- Residual depressive symptoms
  - Continuous
  - Predict risk for relapse (Judd et al., 1999; Nierenberg, et al., 2010)
  - MBCT associated with reduction residual symptoms (Kenny & Williams, 2007; Kingston, et al., 2007; Mathew et al., 2010)
  - No comparison yet between 2- and 3+
Confounder argument

- MBCT vs TAU trial in 3+ patients only (Segal et al., 2010)
  - MBCT only effective among unstable remitters = with intermittent residual symptoms
  - No effect in stable remitters = residual symptoms <7
  - Patients with residual symptoms were actually excluded in original studies!
  - MBCT in 2- with residual symptoms???
Hypotheses

- MBCT $\rightarrow$ residual symptoms
- Independent of 2- or 3+ subgroup  
  $=$ no interaction treatment*$\text{subgroup}$
- Explore whether MBCT works via diff. mechanisms in the 2- and 3+ subgroups  
  (rumination, worry, mindfulness positive and negative emotions)
No evidence for interaction
Treatment*Subgroup

<table>
<thead>
<tr>
<th>Measure</th>
<th>$\beta$</th>
<th>$p$</th>
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<tbody>
<tr>
<td>HDRS</td>
<td>0.45</td>
<td>0.162</td>
</tr>
<tr>
<td>IDS</td>
<td>0.33</td>
<td>0.240</td>
</tr>
<tr>
<td>Rumination</td>
<td>0.34</td>
<td>0.206</td>
</tr>
<tr>
<td>Worry</td>
<td>0.23</td>
<td>0.332</td>
</tr>
<tr>
<td>KIMS observe</td>
<td>0.09</td>
<td>0.743</td>
</tr>
<tr>
<td>KIMS describe</td>
<td>0.25</td>
<td>0.236</td>
</tr>
<tr>
<td>KIMS act aware</td>
<td>-0.18</td>
<td>0.522</td>
</tr>
<tr>
<td>KIMS accept</td>
<td>-0.27</td>
<td>0.236</td>
</tr>
<tr>
<td>PA</td>
<td>0.08</td>
<td>0.210</td>
</tr>
<tr>
<td>NA</td>
<td>-0.07</td>
<td>0.284</td>
</tr>
</tbody>
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By subgroup: Hamilton Depression Rating Scale

HDRS

- 2- TAU
- 3+ TAU
- 2- MBCT
- 3+ MBCT

pre    post
Same for self-report...
Effect Size of Treatment per Subgroup

- HDRS
- IDS-SR
- Rumination
- Worry

2- 3+

-0.8 -0.7 -0.6 -0.5 -0.4 -0.3 -0.2 -0.1 0
Conclusions

- Need to re-examine and reconsider:
  - MBCT just as effective in 2- as in 3+
  - At least when looking at participants with residual symptoms