Changes in Well-Being from a 30-minute Meditation: Comparing the Effects of Different Delivery Methods

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Most Previous Approaches

1) Long-Term Meditation
   Most studies are *correlational*, looking at difference between long-term *meditators* vs. *non-meditators*

   Fewer studies are *interventional*, often long-term (*3 months*) retreats (compared to wait-list controls)

2) Cohort is typically Self-Selecting
   Participants are *incentivized to improve*
Most Previous Approaches: Limitations

1) Long-Term Meditation

*Impossible to know which aspects of the meditation are most effective*

2) Cohort is typically Self-Selecting

*There could be “placebo effects”*
Current Approach

1) Short-Term Meditation (30 minutes)

- Is 30 minutes enough to see improvement in well-being?

- If so, this allows more conditions to be tested to study the effects of different aspects of meditation

2) Cohort is not Self-Selecting

Randomized Control Trial

...........with Active Control
Methods

30-Minute Meditation

1) Walking Meditation/Body Scan: 10 minutes
2) Mindful Meditation (Vipassana): 10 minutes
3) Compassion Meditation: 10 minutes

In groups of 10

Control: 30-Minute Movie

Question 1-
Is 30 minutes of meditation sufficient to improve well-being?
### Methods

#### 30-Minute Meditation: 4 conditions (2 x 2 factorial)

<table>
<thead>
<tr>
<th>Leader Present</th>
<th>No Expectation</th>
<th>Expectation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Leader No expect</td>
<td>Leader Expect</td>
<td>Record No expect</td>
</tr>
</tbody>
</table>

“This exercise is expected to enhance your well-being, and I hope this will happen for you today”

**Question 2** - *Does having the leader present produce greater improvement?*

**Question 3** - *Does expectation produce greater improvement?*

Relevant to the question of effectiveness of online Apps!

(also investigated this for the Movie Control)
Question 4- Does being in a group produce greater improvement than being alone?

Relevant to the question of effectiveness of online Apps!
186 Participants (campus undergraduates)

Mean age = 20.4 ± 0.2 years

<table>
<thead>
<tr>
<th></th>
<th>N</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Gender</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Female</td>
<td>130</td>
<td>69.9%</td>
</tr>
<tr>
<td>Male</td>
<td>52</td>
<td>27.9%</td>
</tr>
<tr>
<td>Transgender or unreported</td>
<td>4</td>
<td>2.2%</td>
</tr>
<tr>
<td><strong>Race</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Asian</td>
<td>117</td>
<td>62.9%</td>
</tr>
<tr>
<td>White</td>
<td>24</td>
<td>12.9%</td>
</tr>
<tr>
<td>Hispanic</td>
<td>28</td>
<td>15.1%</td>
</tr>
<tr>
<td>Other</td>
<td>17</td>
<td>9.1%</td>
</tr>
</tbody>
</table>
Methods

Participants filled out Mental Well-Being Questionnaires PRE and POST Intervention

Improvement (%) = \frac{(POST - PRE)}{\text{Max Points on Questionnaire}}
Which Questionnaires?

Exploratory

1) Mood Scale, 42-Item (Huelsman et al, 1998; Brief et al.1988; Thompson, 2007)
2) State-Trait Anxiety Inventory (STAI) (Spielberger et al., 1983)  
   a) State  
   b) Trait  
3) Warwick Mental Well-being (Stewart-Brown et al. 2009)  
4) Psychological Well-Being Scales (PWB), (Ryff & Keyes, 1995)  
5) Five Facet Mindfulness Questionnaire, 20 items (Baer et al, 2006)  
6) Multidimensional Assessment of Interoceptive Awareness (MAIA) (Mehling et al., 2012)  
7) Compassion Love for Humanity Scale (Pommier, 2011)
Question 1: Is 30 minutes sufficient? (Meditation vs. Movie Control)

MANOVA results: $F(8,137) = 2.10, p = 0.0396$

<table>
<thead>
<tr>
<th>Questionnaire</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>1) Mood Scale</td>
<td>13.9</td>
</tr>
<tr>
<td>2) STAI-State</td>
<td>5.66</td>
</tr>
<tr>
<td>3) STAI-Trait</td>
<td>1.94</td>
</tr>
<tr>
<td>4) Compassion</td>
<td>1.92</td>
</tr>
<tr>
<td>5) Psychological Well-Being</td>
<td>1.64</td>
</tr>
<tr>
<td>6) MAIA</td>
<td>0.44</td>
</tr>
<tr>
<td>7) Warwick-Edinburgh</td>
<td>0.25</td>
</tr>
<tr>
<td>8) Five Facet Mindfulness Q</td>
<td>&lt; 0.0001</td>
</tr>
</tbody>
</table>
Question 1: Is 30 minutes sufficient? (Meditation vs. Movie Control)

<table>
<thead>
<tr>
<th>Questionnaire</th>
<th>F(1,44)</th>
<th>p value</th>
</tr>
</thead>
<tbody>
<tr>
<td>1) Mood Scale</td>
<td>13.9</td>
<td>0.000277</td>
</tr>
<tr>
<td>2) STAI-State</td>
<td>5.66</td>
<td>0.0187</td>
</tr>
</tbody>
</table>

Positive vs. Negative
- e.g., Enthusiastic
- e.g., Peaceful
- e.g., Upset
- e.g., Tired
Question 1: *Is 30 minutes sufficient?*

MANOVA: \( F(3,149) = 5.16, p = 0.002 \)

- **Meditate** = 111 (all 4 conditions collapsed)
- **Movie** = 45

![Graph showing improvement in mood and anxiety](image)

- **Improvement (Post-Pre)/Max**
- **POSITIVE MOOD** (reversed)
- **NEGATIVE MOOD** (reversed)
- **STATE ANXIETY** (reversed)

*Increasing Well-Being*
*Decreasing Well-Being*
**Question 1: Is 30 minutes sufficient?**

MANOVA: $F(3,149) = 5.16, p = 0.002$

- Meditate = 111 (all 4 conditions collapsed)
- Movie = 45

Survey Fatigue

**Survey Fatigue**

- **Positive Mood (reversed)**
- **Negative Mood (reversed)**
- **State Anxiety (reversed)**

**Question 1:** Is 30 minutes sufficient?
Question 1: *Is 30 minutes sufficient?*  
**YES!**

MANOVA: $F(3,149) = 5.16, p = 0.002$

- Meditate = 111 (all 4 conditions collapsed)
- Movie = 45

**Improvement (%) (Post-Pre)/Max**

- **Positive Mood**
  - Meditate: *p < 0.001*
  - Movie: *p = 0.076*

- **Negative Mood** (reversed)
  - Meditate: *p = 0.007*
  - Movie: *p = 0.026*

- **State Anxiety** (reversed)
  - Meditate: *p = 0.007*
  - Movie: *p = 0.026*

Increasing Well-Being  
Decreasing Well-Being
Question 2- *Does having the leader present produce greater improvement?*

**No**

<table>
<thead>
<tr>
<th>Leader Present</th>
<th>No Expectation</th>
<th>N = 29</th>
<th>Expectation</th>
<th>N = 29</th>
</tr>
</thead>
<tbody>
<tr>
<td>Recording of Leader</td>
<td>No Expectation</td>
<td>N = 27</td>
<td>Expectation</td>
<td>N = 26</td>
</tr>
</tbody>
</table>

MANOVA: $F(3,102) = 1.42$, $p = 0.24$

**NO!**

So far, this is good news for online Apps!

……although more to say about this in Q&A
Question 3- Does expectation produce greater improvement?

MANOVA: $F(3,102) = 3.71, \ p = 0.014$

YES!

Interaction Not Significant: MANOVA: $F(3,102) = 0.85, \ p = 0.47$
Question 3: Expectation Effects for Meditation

Only significant for **Negative Mood**

- **Expect** = 55
- **No Expect** = 56

* p = 0.001

- **Positive Mood**
- **Negative Mood** (reversed)
- **State Anxiety** (reversed)

**Improvement (%) (Post-Pre)/Max**

- **Increasing Well-Being**
- **Decreasing Well-Being**
Question 4: Is it better to be in a group?

Group Meditation = 27 (Recording, No Expect)

- Positive Mood
- Negative Mood (reversed)
- State Anxiety (reversed)

Increasing Well-Being
Decreasing Well-Being
Question 4: *Is it better to be in a group?*

MANOVA: \(F(3,52) = 1.32, p = 0.28\)

(NO!)
Some further analysis on Negative Mood

1) Pre Scores Predict Improvement
2) Two Types of Negative Mood
   High Energy: e.g., “Upset”
   Low Energy: e.g., “Tired”

Maybe come back to in Q&A
Some further analysis on **Negative Mood**

**Pre Scores Predict Improvement**

Putting Pre Scores into the statistical model reveals somewhat stronger effects of our manipulations.

\[ r = -0.41 \]

Might be due to regression towards the mean

![Graph showing scatter plot with regression line](image)
Conclusions

1) Yes, 30 minutes of meditation is sufficient for improving well being
   - Use State, not Trait, Questionnaires (and not too many)

2) No, it does not help to have the leader present
   - But maybe that is idiosyncratic

3) Yes, people improve more if we tell them to expect it
   - Is that real? Or are they just telling us what they think we want to hear?

4) No, it is not better to be in a group meditation vs. alone

   Online Meditation Apps might be “as good as it gets”
   (but perhaps expectation should be added in)
Thank you!