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>Recording of Leader</th>
<th>No Expectation</th>
<th>Expectation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Leader No expect</td>
<td>Record No expect</td>
<td>Leader Expect</td>
<td>Record 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?*

Relevant to the question of effectiveness of online Apps!

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

(also investigated this for the Movie Control)
Methods

30-Minute Meditation: 1 extra condition

1 participant at a time
Recording
No Expectation

VS.

10 participants at a time
Recording
No Expectation

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>
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<tr>
<td><strong>Race</strong></td>
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<td></td>
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<tr>
<td>Asian</td>
<td>117</td>
<td>62.9%</td>
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<tr>
<td>White</td>
<td>24</td>
<td>12.9%</td>
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<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)}{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>$F(1,44)$</th>
<th>p value</th>
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</thead>
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<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>
<tr>
<td>3) STAI-Trait</td>
<td>1.94</td>
<td>0.17</td>
</tr>
<tr>
<td>4) Compassion</td>
<td>1.92</td>
<td>0.17</td>
</tr>
<tr>
<td>5) Psychological Well-Being</td>
<td>1.64</td>
<td>0.20</td>
</tr>
<tr>
<td>6) MAIA</td>
<td>0.44</td>
<td>0.51</td>
</tr>
<tr>
<td>7) Warwick-Edinburgh</td>
<td>0.25</td>
<td>0.62</td>
</tr>
<tr>
<td>8) Five Facet Mindfulness Q</td>
<td>&lt; 0.0001</td>
<td>0.99</td>
</tr>
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</table>
Question 1: Is 30 minutes sufficient? (Meditation vs. Movie Control)

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- **States**
  - Positive e.g., Enthusiastic, Peaceful
  - Negative e.g., Upset, Tired
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

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

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

*Survey Fatigue*
**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** (reversed)
- **Negative Mood** (reversed)
- **State Anxiety** (reversed)

- *\( p < 0.001 \)*
- *\( p = 0.007 \)*
- *\( p = 0.026 \)*
**Question 2- Does having the leader present produce greater improvement?**

NO!

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

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<td>$N = 29$</td>
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</tr>
<tr>
<td>Recording of Leader</td>
<td>$N = 27$</td>
<td>$N = 26$</td>
</tr>
</tbody>
</table>

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!**

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<th>No Expectation</th>
<th>N = 27</th>
<th>Expectation</th>
<th>N = 29</th>
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**Interaction Not Significant:** MANOVA: $F(3,102) = 0.85, p = 0.47$
Question 3: Expectation Effects for Meditation

Based-lined to Movie condition

Expect = 55
No Expect = 56

Increasing Well-Being
Question 4: Is it better to meditate in a group? **NO!**

Based-lined to Movie condition

**STATE**
- ANXIETY (reversed)
- POSITIVE MOOD
- NEGATIVE MOOD (reversed)

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

- **Group Meditation = 27** (Recording, No Expect)
- **Single Meditation = 23** (Recording, No Expect)

**Increasing Well-Being**

**MOOD**

**MOOD (reversed)**

**ANXIETY (reversed)**
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”
Some further analysis on *Negative Mood*

Pre Scores Predict Improvement

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

Might be due to regression towards the mean

$r = -0.41$
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)