You Can't Fake Calm:
Designing and Evaluating
Respiratory Regulating Interface
for Calming Technology

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Breathwear

Breathing Rate
How to design and evaluate user interface for respiratory regulation?
Two types of guide
Visual & Auditory
Visual Guide
Design

= Guide

= User
Visual Guide

Design

= Guide

= User
Auditory Guide Design
Auditory Guide Design
Results
Study Result (N=14)
Study Result \( (N=14) \)

Self-reported Calming Effects

- **Calmed**: 5
- **No Change**: 4
- **Stressed Out**: 1

\( A > V \) \( (p=0.038) \)
Study Result (N=14)

Self-reported Calming Effects

- Calmed: 5
- No Change: 4
- Stressed Out: 3

Auditory Visual

A > V (p=0.038)

• Naturally Auditory
Study Result (N=14)

Self-reported Calming Effects

- Calmed
- No Change
- Stressed Out

Auditory > Visual (p=0.038)

- Naturally Auditory
- Attention
Study Result $(N=14)$

Self-reported Calming Effects

- **Calmed**
  - Auditory: 5
  - Visual: 4

- **No Change**
  - Auditory: 3
  - Visual: 2

- **Stressed Out**
  - Auditory: 1
  - Visual: 1

$A > V \ (p=0.038)$
Study Result \( (N=14) \)

**Self-reported Calming Effects**

- Calmed: 5
- No Change: 3
- Stressed Out: 1

Auditory > Visual \( (p=0.038) \)

**Breathing Rate Reduced**

- Breath/min: 4

Auditory < Visual \( (p>0.05) \)
Summary

How to design and evaluate user interfaces for respiratory regulation?

Audio > Visual

Conformity ≠ Self-rated Score
Thanks
Method

- $N=14$
- Four Design
## Design Spaces

<table>
<thead>
<tr>
<th>Device</th>
<th>Specialty Device</th>
<th>Smart Phone</th>
<th>Desktop</th>
</tr>
</thead>
<tbody>
<tr>
<td>User Attention</td>
<td>Full Attention</td>
<td>Semi Attention</td>
<td></td>
</tr>
<tr>
<td>Practice Duration</td>
<td>1-5 mins</td>
<td>5-20 mins</td>
<td>&gt; 20 mins</td>
</tr>
<tr>
<td>Stimulus</td>
<td>Continuous</td>
<td>Rhythmic</td>
<td></td>
</tr>
<tr>
<td>Type of Guidance</td>
<td>Auditory</td>
<td>Visual</td>
<td>Physical Contact</td>
</tr>
<tr>
<td>Evaluation</td>
<td>Self-report Score</td>
<td>Breathing Rate</td>
<td></td>
</tr>
<tr>
<td>Social Interaction</td>
<td>None</td>
<td>Asynchronous</td>
<td>Synchronous</td>
</tr>
</tbody>
</table>
Future work
Self-reported Calming Effects

Calmed
No Change
Stressed Out

A  AS  V  VS