

Psychology Documentation

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MINDFULNESS

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What is mindfulness?

Mindfulness is a state of being present and observing the current moment without judgement (Sauer et al., 2013). There are various activities, such as meditation or yoga, that can facilitate mindfulness states.

All it takes is 10 mindful minutes | Andy Puddicombe



Mindfulness explained by 'Headspace' creator Andy Puddicombe

Underlying the concept, Grossman, Niemann, Schmidt and Walach (2004) suggest that humans are usually operating in “automatic pilot mode” where we are unaware of our moment-to-moment experiences. Mindfulness develops the ability to sustain attention on mental content which enables a more accurate perception of how we respond to our thoughts and the world around us. This leads to enhanced emotional processing and coping regarding stress and illness, thus providing greater positive outlook and self-control.

Mindfulness, cognition and emotion

The benefits of mindfulness are widespread with examples ranging from enhanced cognitive functioning and mood through to pain relief, relationship satisfaction and greater quality of life.

A dedicated mindfulness virtual reality experience would be highly effective as a tool to induce cognitive and emotional states. Yet this is not completely necessary. There are tools and principles we can draw from which can be implemented within an experience to encourage a state of mindfulness in users.

Research Evidence – calm

The positive effects of mindfulness interventions are extremely well validated. As research continues to thrive in this area the health benefits associated with the brain, body and mind becomes more and more clear.

Importantly for virtual reality design, this evidence supports the use of mindfulness through various technology mediums. More so, the benefits apply to novice meditators after very short intervention periods. This means that experiences which draw on mindfulness principles will not (and should not) be exclusive to people with more experience in such practices.

Example research evidence supporting the effects of mindfulness interventions and calm

Technology Supported Mindfulness

Traditional mindfulness exercises are often inaccessible and lack the engagement factor required to encourage regular practice amongst non-meditators. Technology-supported mindfulness applications have grown in popularity because they offer novel, entertaining approaches which can reach wider audiences.

Mani, Kavanagh, Hides, and Stoyanov (2015) conducted a review of mobile-based mindfulness apps. The authors identify the features most reflective of high-quality mindfulness apps. From this we outline five mindfulness exercises, elements of which can be implemented in short VR experiences.

Mindfulness exercises

1. Breathing

Slow and deep breathing whilst encouraging awareness of the in and out breathes.

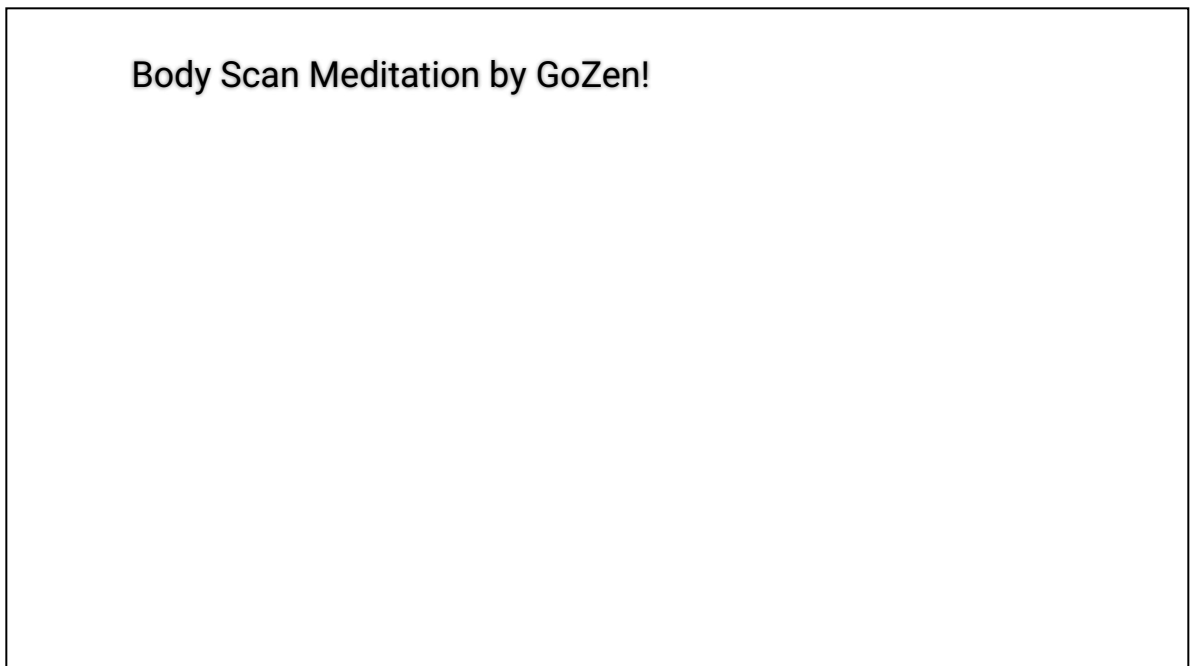
3-minute Mindful Breathing Meditation (Relieve Stress)



Mindful breathing exercise

2. Body scan

Awareness of the body focusing on each of the body parts, usually starting from the toes or the head and progressing up or down. A visual representation of a body could be used to direct attention whilst highlighting different body parts when progressing through the scan.



Body scan exercise

3. Thoughts and emotions

Acknowledging thoughts and emotions non-judgmentally, as they come and go.

Mindfulness Meditation: Mindfulness Exercise, Being Mindful o...

Mindfulness exercise accepting thoughts and emotions

4. Identifying as an object

Common examples include imaging oneself as a mountain and feeling stronger or as a lake experiencing stillness and peace. It may be beneficial to transition between different viewpoints (e.g., an onlooker looking at a mountain vs. the viewpoint of a mountain looking down).

Mindfulness: Mountain Meditation (15 mins)

Mountain meditation exercise

5. Object focus

This involves concentrating on one particular object whilst bringing attention back to the object as the mind wanders. The object should be attractive or interesting. Having a choice between various virtual objects at the beginning of an experience would be advantageous.

How to Meditate ~ Focusing on an Object

Object focus exercise

Interactive mindfulness – Is expert guidance necessary?

Most of the apps reviewed by Mani et al. (2015) are passive and involve voice-guided meditation. Implementing guided mindfulness practice into Liminal VR experiences is certainly worth exploring yet this may require qualified teachers.

Mindfulness principles can be implemented within VR experiences without the need for voice guidance. In the [breathing](#) section we discuss the use of visual and audio cues to guide users to desirable breathing patterns.

A growing body of evidence suggests that mindfulness applications can be extremely effective whilst utilising user interaction capabilities and text, visual, and audio feedback.

Chittarro and Vianello (2014) compared a technology supported technique for mindfulness (AEON) with two traditional thought distancing techniques (Figure 2). AEON outperformed the other methods in areas of achieving mindfulness, ease of use and enjoyment.

(a)

(b)

(d)

(c)

Different stages of AEON: Users submit persistent negative thoughts (a), when they decide to 'practice', the app switches to the practice screen where thoughts are displayed on parchment under water (b).

Users can then interact with the water by touching parts of the screen (c) which after a number of interactions will cause the thought to disappear (d).

A Framework for Interactive Mindfulness Applications

Salehzadeh Niksirat et al. (2017) introduced the framework which encompasses components of the attention regulation process, attention restoration theory, and relaxation response.

Differently from the thought distancing technique used in AEON, this framework is concerned with focused attention on a singular movement pattern, similar to focusing on an object or the inhale and exhale of the breath.

Attention Regulation

The attention regulation process describes a cycle of self-regulation supported by technology-mediated detection and feedback mechanisms (Green, Green & Walters, 1969, 1970).

Technology detects the current state of the user's attention and provides real-time feedback as a guide to help maintain concentration when attention lapses. Previously, this approach relied on dedicated biofeedback sensors (e.g., respiration sensors, EEG).

The technology-mediated attention-regulation process (Salehzadeh Niksirat et al., 2017).

The framework introduced by Salehzadeh Niksirat et al. (2017) leverages the interactive capabilities of mobile devices which removes the need for biofeedback sensors. The researchers implement the framework within a new interactive mindfulness application called 'Pause'.

Users interact through the mobile touch screen with instructions to maintain a slow and steady finger movement pattern. When the application detects movement has veered off course (concentration lost), visual and audio feedback is provided to steer the user back on track.

The infographic below outlines the application Pause implemented within the attention-regulation framework (a), with an overview of the application (b) and the specific interaction steps within Pause (c), (Salehzadeh Niksirat et al, 2017).

Framework essentials

Provide Simplistic Non-demanding Feedback

Attention restoration theory (Kaplan, 1995) suggests that tired cognitive resources require restoration through interactions with non cognitively demanding environments.

Salehzadeh Niksirat et al. (2017) implemented ambient and simplistic visual and audio feedback to support the interaction.

Repetition and slowness is key

There are many methods used to elicit relaxation but at the core, slowness and repetition is always key. Walking meditation, Yoga and Tai Chi are all excellent examples exploiting slow, repetitive patterns to induce mindfulness and RR (Salehzadeh Niskirat et al, 2017).

Users of Pause are guided to use slow, repetitive, continuous patterns through finger movements on the touch screen.

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