

Playing with Presence: How meditation can increase the experience of embodied presence in a virtual world

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ABSTRACT

Feeling deeply connected to yourself and your body creates a richer experience of presence in a virtual world, even when your body is sitting in a chair wearing VR goggles. We call this *embodied presence*. Connection to the self and body (paying attention to present-moment sensations and feelings) enhances the sense of self and the sense of presence, regardless of whether you are in the natural world or a VR world. Our Beach VR Meditation demonstrates how meditation can be designed to increase the experience of embodied presence in a virtual world.

1. INTRODUCTION

Feeling deeply connected to yourself and your body creates a richer experience of presence in a virtual world, even when your body is sitting in a chair wearing VR goggles. We designed a meditation experience with the specific intention of helping you connect with yourself and more deeply experience being at a virtual beach. It's your body and senses that make a beach environment come alive most fully.

2. PRESENCE

In 1992 when VR and Carrie Heeter were much younger, she published an article titled "Being There: The subjective experience of presence".¹ She argued that experiencing yourself in VR is the same as the process of discerning and confirming your existence in the natural world. Carrie defined three dimensions of presence: 1) *Personal presence* is enhanced when you can see your body represented in some way and when you can move and look around; 2) *Social presence* comes from other real or virtual beings who react to and interact with you; and 3) *Environmental presence* occurs when virtual objects and environments respond to your presence and actions.

2.1 The 4th Dimension of Presence

The authors' experiences designing and studying cybermeditation reveal the importance of a fourth dimension: *Embodied presence*. Connection to the self and body (paying attention to present-moment sensations and feelings) enhances the sense of self, regardless of whether you are in the natural world or a VR world. Neuroscience calls embodied presence "interoceptive awareness" -- the conscious perception of sensations from inside the body.²

2.2 Interoception and Embodied Presence

Interoception refers to sensitivity to and awareness of physical sensations such as temperature, pain, touch, balance, and sensing from internal gastro-intestinal, respiratory, cardio-vascular and uro-genital systems.³ Together these sensations form our embodied sense of self, our sense of how we are doing and of who we are in the world. Our mind interprets some of these feelings as emotions. Interoceptive awareness, aka embodied presence, is the

process of paying attention to and then acting in the (natural or VR) world informed by these physical and emotional feelings.^{2,3}

3. MEDITATION

Meditation refers to practices that regulate the human system and refine the state of the mind so that the mind can be directed towards an object to bring about a change in the human system.⁴ Meditation often involves directing attention toward specific interoceptive sensations, such as breath or other bodily sensations.^{5,6} Directing attention to these sensations during meditation heightens interoceptive awareness.⁵ Regular practice of meditation "brings interoception forward"⁷ into daily life, as we strengthen interoceptive neuropathways and develop the capacity to connect to ourselves and our bodies.

3.1 Meditation in Virtual Worlds

Meditation is often practiced indoors with eyes closed. We can also meditate in virtual worlds, with eyes open. For example, Cubical Ninjas has developed a virtual reality Guided Meditation App for the Oculus Rift. Unlike VR games, there are no monsters. There is nowhere to go. There is nothing to do. A "player" who chooses the Guided Meditation Costa del Sol environment is flown over the ocean to a luxurious 3D beach, where they simply sit on the beach for 10 minutes and listen to a guided meditation.

3.2 Meditation for Embodied VR Presence

Practicing an appropriately designed meditation can cultivate the capacity to experience embodied presence during meditation and in the world. In theory, meditations can also be designed to cultivate embodied presence in a virtual world. To explore this idea, Carrie invited her meditation teacher, Dr. Marcel Allbritton, to design a VR meditation with a goal of heightening the sense of embodied presence in a virtual world. Cubicle Ninjas CEO Josh Farkas invited us to use his Costa del Sol VR beach environment.

3.2.1 Meditation Expertise and Lineage

Our meditation is created by a practitioner with extensive experience and training in one of the major meditation lineages. Marcel's training and work in yoga therapy integrates breathing, physical postures, and mental attention with holistic understandings of the system of yoga for healing based on the Yoga Sutras of Patanjali.⁸ His background includes a PhD in Information Science, a 3-year Yoga Therapy Training program, 2-year Yoga Therapy internship, additional classes and workshops in India and the U.S., and 7 years of seeing clients one-on-one as a Clinical Yoga Therapist.

3.2.2 VR Meditation Design Process

Marcel began the design process by spending time on the virtual beach. His task was to adapt yogic mind-body meditation design to the constraints and affordances of VR. For example, at a VR beach, eyes will likely be open. Another constraint is that when wearing a VR headset, you can feel but not see your physical body. When seated with your arms by your side, it feels natural to only see the virtual world. Yoga asanas (movements) where we would normally see our arms move feel odd because we feel our body moving yet in the in the VR world no arms appear.

Marcel applied his knowledge of yoga and experience with clients, classes, and workshops to develop a series of carefully sequenced steps, precise wording, and timing. We recorded this version while Marcel was on the beach wearing the headset. We both tried the meditation and talked about our experiences. Marcel revised, and we re-recorded, this time with Carrie in the VR and Marcel instructing her in the meditation. We experienced this version, revised it and recorded a final time.

4. BEACH VR MEDITATION

Our Beach VR Meditation for Embodied Presence moves through carefully sequenced steps to help the player connect with their visual and auditory perception of the virtual beach and with their interoceptive awareness of bodily sensations to more deeply experience being at a virtual beach. As the meditation guide, Marcel instructs the player where to direct their attention. You begin by looking around at the virtual beach – the ocean, the beach, the palm trees -- and listening to the waves and the birds. Then you connect with your body, feeling your hands, what your sitting on, moving your fingers and shoulders slightly, feeling each movement. You return your attention to the beach, more aware of both your body and the beach. You close your eyes and concentrate on your breathing, noticing a slight rising on inhale, a slight lowering on exhale. You open you eyes and feel yourself experiencing the beach. In this state of embodied presence, the beach feels more vivid and you feel more fully there.



Figure 1: Player Observing Virtual Beach.

5. FUTURE WORK

Our work pioneers the design of VR meditation practices that help train the meditator to experience a greater sense of embodied presence not only in the virtual world but in life. We envision therapeutic and personal growth applications of VR meditations to

cultivate embodied presence. VR and game design could also incorporate elements or periods of meditation to make virtual experiences and games feel more vivid and real.



Figure 2: Embodied Self at Virtual Beach

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