INTEROCEPTIVE AWARENESS: THE "BEING" DIMENSION OF "BEING THERE" IN GAMES AND VIRTUAL WORLDS

The "being" dimension of "being there" in games and virtual worlds

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In this paper we introduce, operationalize, and test a theoretical conceptualization of interoceptive awareness (IA) in games and virtual worlds that parallels neurobiological explanations of interoception and embodied presence. We developed a scale to measure state IA during a Virtual Reality (VR) experience by adapting the Multidimensional Interoceptive Awareness (MAIA) scale that was originally created to measure the effects of meditation programs on general propensity for interoceptive awareness in daily life (trait IA).

Interoception is the capacity and propensity to direct and sustain attention to a state of perceptual presence in the body and a particular quality of awareness (Mehling et al., 2012) where the mind stays in a mode of perception (being), rather than action (doing) (Farb et al., 2015). IA can be defined, from the perspective of neuroscience, as sustained interoceptive awareness — "a state of discerning somatosensory attentional orientation" (Heeter, 2016, p. 1). There are large individual differences in IA, and the capacity and propensity for IA can improve with mental training such as meditation (e.g., Mehling et al., 2012; Bornemann et al., 2015; Heeter et al., 2017). IA can also be enhanced through meditation experiences that focus attention on present moment sensations (Heeter and Allbritton, 2015; Brewer et al., 2011; Mrazek et al., 2013).

Most conceptualizations of presence in virtual worlds identify technology as the main causal agent of presence. State IA is defined by an individual's attentional orientation, with or without technology. After all, our mind's natural tendency is to wander, and the natural world and the virtual world are both experienced by the body. The body perceives, interprets, and reacts to visual sensations, sounds, emotions, and thoughts. When we pay attention to the present moment, whether the present moment involves a virtual world or not, we do so by paying attention to the experience of the body. In doing this we feel present and alive. Thus, one of the goals of the current study is to bridge these two approaches to presence, focusing on the relationship between state IA and spatial presence.

We should see a positive correlation between state IA and feelings of self-location's spatial presence because an individual with high state IA during a Virtual Reality (VR) experience is directing attention to present moment bodily sensations and feelings (of being in the virtual world). In all previous presence research, the stimulus was not specifically designed to activate interoceptive awareness. VR technology and meditation afford an excellent opportunity to compare a virtual environment presence measure with state IA measures.

We examined the relationship between IA and the self-location subdimension of spatial presence. Experimental subjects were randomly assigned to either Samsung Gear VR or HTC Vive conditions where they experienced a 10-minute meditation that guided attention to breath and other present moment feelings. The meditation is grounded in the tradition of yoga and yoga therapy (Chandrasekaran, 2012; Desikachar et al., 2005; Mohan and Mohan, 2004) and was designed to activate state IA. Participants were seated and wore a VR headset enabling them to look around inside a 360-degree virtual representation of a peaceful Colorado River scene that seamlessly combined video, animation, and audio. For comparison, a third condition experienced the meditation with eyes closed.

Results suggest that: 1) state IA was correlated with and significantly higher than trait IA; 2) state IA during the meditation was not different between eyes closed and VR conditions, also VR display technology did not influence state IA; and 3) higher state IA was associated with significantly stronger feelings of spatial presence, whereas display technology had no relationship to spatial presence.

The main contributions from the current study are the introduction of IA to virtual world's presence research and the suggestion to consider IA in virtual worlds and game design. We examined the relationship between trait and state IA during a meditation experience designed with the goal of activating IA by relaxing the body, calming the mind, and directing attention to interoceptive bodily sensations including breath, movement, and the feeling of stability. On average, not only was state IA higher than trait IA, but trait IA predicted state IA. This finding suggests that designed experiences can activate interoceptive awareness beyond an individual's normal propensity for IA. We also explored potential differences in state IA between participants when experiencing the meditation through a VR headset or with eyes closed, audio only. Surprisingly, state IA for participants with eyes closed was nearly identical to state IA for VR participants. Finally, we investigated the relationship between different types of immersive VR headsets and state IA and self-location spatial presence, and did not find any. Overall, due to the significance and clarity of the findings, it seems that IA is a pivotal dimension for explicating spatial presence. Involving meditation experts on VR design teams could yield ways of directing the user's attention towards IA during non-meditation VR experiences.

State IA and trait IA are potentially important constructs for the study of presence in games and virtual worlds. Clearly meditation is a specialized VR experience, one where IA can be expected to be high. Our future research moves to consider IA in gaming experiences – how to measure state IA and whether, when, and how state IA is experienced during gameplay. The extent of state IA and its relation to other presence scales could be examined in non-meditation VR experiences. State IA could be manipulated, perhaps by doing a meditation exercise prior to games and other non-meditation VR experiences, potentially enhancing presence.

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JUST MODIKA: PERILS OF MODDING IN DOKI DOKI LITERATURE CLUB

Perils of Modding in Doki Doki Literature Club

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Abstract

Game modifications, or mods, often provide a way for fans and gamers to interact with game content and characters beyond the limitations of the developer's original work. However, when modders invent new content and storylines for independent activist or art games, they can disrupt the developer's intended message. This is the case with two mods, *Monika After Story* and *A Brand New Day* that were created for the popular independent game, *Doki Doki Literature Club* (*DDLC*). The unmodded version of *DDLC* is a psychological horror game that critiques both the cultural hegemony that drives the dating simulator (dating sim) genre and the concept of player control over narrative games. Both mods restore the dating sim's original tropes to the narrative by allowing the player to "save" all of the doomed characters or continue to romantically pursue the game's antagonist, Monika. To complicate the relationship between the game and its fans, developer Team Salvato has released a policy expressly prohibiting mods created with the intention of replacing the original game; all *DDLC* mods must be extensions of the experience to be played after the game rather than standalone products. Through this complicated relationship, the themes of psychological terror and loneliness present in the original game are replaced with heartwarming sentimentalism and even humor traditionally found in dating sims. Thus, both mods erase the activist message even as they provide solace to players who were initially disturbed by *DDLC*'s characters and themes.

Introduction

Doki Doki Literature Club (Version 1.1.0, Team Salvato, 2017) one of the most popular games of 2017, begins with a warning that it "is not suitable for children or those who are easily disturbed." The warning appears in stark contrast to the aesthetics of the title screen, which depicts a quartet of cute anime high school girls. They are the girls of the school's newly formed literature club—Monika, Natsuki, Sayori, and Yuri, each clad in the typical short pleated skirts and knee socks of the anime schoolgirl, and each with her own visual quirks like vibrantly-hued hair. It doesn't take long for the first-person main character to agree to join the club, not only because he is pressured by his childhood best friend, Sayori, and the club president, Monika, but because he sees an opportunity to build a relationship with one or more of the club's attractive members. After all, what could be better than membership in a club in which he has his choice of the four women who are competing for his attention? However, small hints reveal that this club is more than poetry-sharing and frivolous flirting. As the main character states just before the first club meeting, "And thus, today marks the day I sold my soul for a cupcake." With the game's initial warning in the back of their mind, the player can