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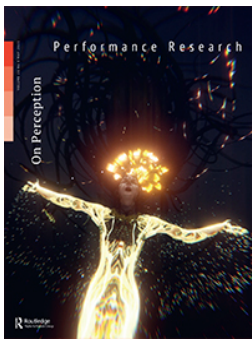
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Interoceptive Dramaturgies of ‘Surrogate-selves’ in Performative VR Experiences

PIOTR WOYCICKI

Through a close analysis of interoceptive dramaturgies, and by drawing on neuroscientific and cognitive definitions of interoception, this article will explore what is at stake in employing interoceptive oriented design in performative virtual reality (VR) environments and the ethical implications of manipulating corporeal experiences through these perceptual modalities. In this contribution, I examine two contrasting performative VR experiences: a one-to-one interactive virtual reality performance—*Goodnight, Sleep Tight* (2017) by ZU-UK—and *Half-Life: Alyx* (2020)—a VR game by Valve. The first case study is part one-to-one performance and 360-degree VR video inviting the participant to experience a dream through the eyes of a child. It is a gentle, poetic and subtly constructed VR experience that draws the participant into the world of childhood memories. The second case study is a survival horror videogame set in a three-dimensional (3D) VR environment replete with violence, gore and invasive interactivity. Despite the contrasts between the two case studies I contend, following Liam Jarvis’s (2019) insight, that in both cases players/participants are construed and perform as ‘surrogate selves’ of their respective avatars. I also argue that their experiences are to a great extent conditioned through interoceptive aesthetics.

INTEROCEPTION

I begin by defining interoception and establishing its key sensory modalities because this form of cross-modal perception is central to the experience and affective effect of performative VR. The term is used broadly in cognitive psychology and neuroscience to describe a vast array of sensations and perceptions ‘of the state of the body’ (Ceunen *et al.* 2016: 1). Studies of interoception are concerned with internal body states and

internally sensed stimuli. These are considered in contrast to ‘exteroception’, which refers to external stimuli and exogenous events that act upon and are perceived and sensed by the body. It is important to note that both perceptual modalities form part of ‘homeostasis of perception’ (Damasio 1999: 138) and cannot always be easily separated nor considered entirely separately in performance analysis. This is at least for two reasons: 1) external stimuli are often required to elicit internal perceptions (that is, audio-visual stimuli fed through a VR headset) and 2) ‘receptor systems and pathways for both’ modalities are not mutually exclusive (Ceunen *et al.* 2016: 6). For example, an ‘exteroceptive percept results from an integration of various sensory modalities including body state sensations (as well as past experience and other factors)’ (7). This is the case with VR motion sickness that is a result of dissonance between multiple modalities that are ‘normally’ homeostatically interconnected. As I attempt to consider various distinct aspects of interoceptive experiences in my analysis of the case studies I remain aware that they form part of the homeostatic state of the body and fall back on the phenomenological experience of the body as a whole (Leder 2018: 177). Because the experience of interoception often is subjective my approach to analysis is mainly based on my subjective sensory observations as an audience member. As Klich quoting Leder suggests, this degree of subjectivity limits the transferability to other people and contexts of the insights I arrive at: ‘We cannot assume that the same processes will elicit similar inner experiences for different individuals, or even for the same individuals at different times’ (Leder cited in Klich 2019: 177). My subjective observations are reflected on and analysed with reference to 1) distinct aspects of interoception; and 2) insights about creative strategies and intentions drawn from

an interview I conducted with Jadé Maravala, director/writer of *Goodnight, Sleep Tight*.

I now consider a selection of the more distinct aspects of interoception that are useful for the analysis of my case studies. Klich defines interoception as an umbrella term that ‘includes two forms of perception: proprioception (involving signals from the skin and musculoskeletal system) and visceroreception (involving signals from the internal organs such as heart rate, breath and digestion)’ (Pollatos cited in Klich 2019: 177).

Proprioception is a perceptual modality that involves awareness of movement and spatial positioning. It is in essence a kinaesthetic inner sense. It is comprised of signals from the skin surface, musculoskeletal system, muscle tensions and positioning and the vestibular system (signals inner ear), which is responsible for the sense of balance. This is an important modality when considering VR experiences since VR headsets read, coordinate and stimulate the experienter’s physical movements, their sense of spatial awareness and also their sense of rhythm.

Another aspect of proprioception that is relevant to VR design and interoceptive dramaturgies is that of *predictive coding*. It is an ability of the brain to simulate movements and ‘embodied states’ before they occur. Essentially it defines the process of perception as a simulation of a future state as opposed to a reflection on what has just occurred. Many VR performative environments are designed to allow the experienter to locate themselves in virtual space and map their body movements onto that of an avatar. Arguably, this is partially achieved through predictive coding, where the brain predicts how movements will affect the virtual environment and the subject’s positioning within it.

Sensations that arise from jarring, ‘mislocalizing’ or even ‘glitching’ (Jarvis 2019: 230) interoceptive modalities also form an integral part of interoceptive dramaturgical operations designed for VR experiences. One of these disruptive sensations is a feeling of an *out-of-body experience* that may result from a disconnection of proprioceptive awareness from visual and auditory stimuli that normally accompanies it. This is an aesthetic feature

sometimes used in VR experiences when, for example, the experienter is invited to ‘fly through space’ allowing them to freely spectate a virtual space from a mobile virtual viewpoint while all the time being consciously aware that they are sitting down and fixed in physical space.

VR experiences often trigger physiological reactions by design, which bring to the fore the visceroreceptive sensations. *Visceroreception* overlaps with proprioception (for instance, the activity of the vestibular system), but is generally said to perceive signals from internal organs such as heart rate, temperature, breath, sweat and digestion (Pollatos *et al.* 2016: 1).

GOODNIGHT, SLEEP TIGHT

In the spring of 2019, I participated in a version of *Goodnight, Sleep Tight* by the performance company ZU-UK at a Theatre and Performance Research Association (TaPRA) Interim Event held at the University of South Wales, Cardiff. The piece was written and directed by Jadé Maravala and designed in collaboration with the company. The first section of the piece was a one-to-one performance, presented live in a studio space.¹ The second section was a 360-degree film displayed through VR, which was filmed in a favela in Bogotá (Columbia) near an orphanage.

The performance space was comprised of a bed with additional props such as a bedside lamp, pillows, a teddy and a stand with a tablet. The performer was sitting on the side of the bed near the tablet that was connected to a VR Head Mounted Display (HMD). She invited me to lay down on the bed, tucked me in and asked me to relax. I was then given the HMD to wear. In the HMD there was a 360-degree film of a room uncannily similar to the one I was in.² As I ‘looked around’ the space³ inside the VR film I could see the same performer sitting beside me. My body, however, was that of a child, virtually mapped onto where my actual body was in physical space. I felt a sense of embodiment of my implied child avatar. The performer’s movements in the VR film were synchronized with her actual actions. I could, for example, feel her virtual image tucking me in, stroking my hair, giving me the teddy. She then

¹ At the Interim event the piece was performed in a studio space, but past performances were held in other spaces such as galleries.

² In other performances of the piece the company would film this section in the actual space they were performing in.

³ A 360-degree film allows one to look around from the camera’s point of view through the HMD.



■ ZU-UK's *Goodnight, Sleep Tight*, London, 2017. Photo Ludovic des Cognets.

sung a lullaby and began putting me to sleep. What followed was a transition into the second section. I was prompted to sit up on the bed and the first-person camera perspective that I embodied until then slowly drifted away from me, flying through the space towards a window. It felt like an out-of-body experience when the first-person perspective detached from that of the child avatar to which I felt connected. The image then changed to a 360-degree film of the camera flying above a favela in Bogotá.⁴ This transition felt like a liminal 'white act', a transition from reality to the world of a dream. As I was physically sitting on the bed, I tilted my head to look down and below me I could see children playing football on a dusty pitch. As I looked up, I could see a glimmering skyline of the city in the distance, interspersed with hills and silvery clouds towering above. I felt an uncanny sense of freedom since, on the one hand, I was able to look in whichever direction I wanted and my visual senses indicated that I was constantly moving (flying) through space, yet, on the other hand, I was aware that my physical body was static and fixed, unable to negotiate its position in virtual space apart from changing the direction of the camera's perspective. As a result of this slightly disorienting jarring I felt free and trapped at the

same time. This section was accompanied by a voiceover of a text written in second person. The text was a poetic meditation that invited me to reflect on my childhood, the ever-changing perspectives around us and ultimately my own mortality—'[t]he moment your personal narrative comes to an end' (Maravala cited in Dunne et al. 2018: 220). This experience felt like a conscious dream, a lucid trance, gentle and comforting on the one hand but also emotionally taxing and somewhat disconcerting on the other.

As Jadé Maravala recounted in the interview, the design of the piece was informed by an awareness of interoceptive aesthetics, and much attention has been paid both to how proprioceptive and vicerceptive sensations were elicited through the dramaturgy of the piece (Woycicki 2020). One of the vicerceptive sensations elicited earlier on was the breathing pattern. The performer would 'lock' into the participant's breath and mirror their breathing by resorting to Jerzy Grotowski's techniques. She could then induce a breathing pattern in the participant, by 'tuning' into their rhythm in order to make them feel relaxed and as validated as possible within the environment. Another

⁴ This was filmed in the favela using a drone equipped with a 360-degree camera.

⁵ Entrainment is a 'temporal locking process in which one system's motion or signal frequency entrains to the frequency of another system' (Thaut *et al.* 2015: 1).

vicerceptive aesthetic used was the manipulation of heartbeat. This was done through the soundtrack and a process called 'entrainment'⁵ (Thaut *et al.* 2015: 1). The soundscape throughout the piece used granular aesthetics to move away from suggesting a stable melody, constant rhythmic patterns, repetitive phraseology and so forth. The brain is a pattern-seeking machine and when confronted with a soundtrack that is constantly morphing musical patterns, it has a tendency to potentially 'switch off' pattern-seeking functions and lapse into a meditative state (Woycicki 2020). This, in turn, can have an effect on heartbeat and breathing patterns. In this case it was intended to slow them down. From a dramaturgical perspective, the manipulation of breathing and heartbeat had the effect of inducing me into a dream-like state, which corresponded to the themes of the piece at that point. It also elicited a sense of a partial disconnect from my immediate physical environment, a gradual drifting away.

In terms of proprioceptive aesthetics, the performance played with my sense of spatial awareness, sense of balance and body positioning. Much of the performance produced effects akin to body transfer illusions and body schema mapping. My physical body was mapped onto that of a child avatar. This was both an uncanny and strangely familiar experience. It was uncanny due to the fact that I was asked to inhabit an avatar of a 6-year-old Other whose body was smaller than mine. At the same time, it also felt familiar since I recalled being tucked in by my mother as a 6-year-old child. The vicerceptive sense of warmth from being covered by a blanket also contributed to this. Like other one-to-one VR performances such as *Draw Me Close* (2019), this performance relied on ritualized actions to contribute to the sense of familiarity. The strategy partakes in the rich tradition of one-to-one performances. As Harry Wilson argues: '[t]he actions—putting you to bed, hugging, holding hands—have been regularly ritualised by practitioners such as Howells, Rosana Cade, Louise Brodie and others' (2020: 6).

There was a sense of a 'proprioceptive drift', which Liam Jarvis defines as 'an artificially

constructed distortion of bodily selfhood that corresponds with non-delusional neurological phenomena such as phantom limbs... and whole-body VR illusions' (2017: 34). This distortion is never fully actualized in VR body transfer illusions and it wasn't the case for me here. Even though a lot of the interoceptive dramaturgy made me feel immersed in the virtual scenario I was constantly reminded of the constructed nature of my perception. Maravala claimed that she purposefully built in glitches and incongruities into the design of the piece to instil a self-reflexive stance in the participant and position them in a 'liminal' state, somewhere between the dream and reality. This sense of liminality and jarred proprioceptive sensations became even more apparent during the flight section. This was the result of the disconnect between the moving camera and my fixed physical position, which jarred my sense of predictive coding and vestibular spatial positioning. This disconnect between the visual and proprioceptive arguably created a distanced, self-reflexive stance. This experience was congruous with the logic of the text:

Understanding the world requires you to keep a certain distance from it....

We are always struggling to get that right distance between us and the stuff around us. (Maravala cited in Dunne *et al.* 2018: 220)

The text then progressed into a mediation on mortality:

Let's skip forward.... The moment of your death. The moment your personal narrative comes to an end.

What will it be like?

Where will you be?...

It's a difficult idea to think on? (ibid.)

This proprioceptive disconnect almost felt like an out-of-body experience, as if my soul was leaving my body and drifting into space. Yet, at the same, time I felt always tethered towards 'reality', giving me a sensation that at any time I could fall. These sensations were not 'illusions' per se, since parts of my brain responsible for proprioceptive sensations were 'convinced' that this was actually happening (that is, I was actually flying even though I consciously knew I was not). This sensation made me feel somewhat

disoriented and coupled with the direct address of the text and its morbid theme I felt vulnerable and exposed. From a design perspective, in *Goodnight, Sleep Tight* there was a clear attempt to alternate states and degrees of immersion and interoceptive engagement in order to induce a self-reflexive, quasi-Brechtian stance. It was arrived at by displaying 'the devices of performance in performance' (Chapple and Kattenbelt 2006: 11).

HALF-LIFE: ALYX

The second case study is different and contrasting in its use of interoceptive dramaturgy. It is not an intermedial performance with a live component. Also, the design tends to avoid purposeful self-reflexivity, bar some instances of stress mitigating strategies, in an attempt to create a more seamless, immersive experience through a carefully structured interoceptive dramaturgy.

Half-Life: Alyx (2020) is the new instalment of the *Half-Life* game franchise developed by Valve Corporation. It is a survival horror/first-person shooter hybrid designed exclusively for VR. The game's narrative is set in a dystopian future between the events of *Half-Life* (1998) and *Half-Life 2* (2004), where Earth has been invaded and colonized by an alien civilization called the Combine. Apart from a brutal regime imposed on the human civilization, humans have been exposed to a plague and a set of alien diseases and many infected turned into zombie-like creatures (a common trope of many survival horror games, for example, *Resident Evil 7: Biohazard*). In the game, the player takes control of the eponymous protagonist, a young woman Alyx Vance, who together with her father Dr Eli Vance and other members of a resistance movement set out to combat the Combine. *The first chapter of the game began in Alyx's apartment set in an Eastern European city under Combine's occupation. As a player I embodied Alyx by having my body mapped onto hers. In the first scene, I could 'walk' around the balcony, look at the scenery around me, pick up objects such as books, boxes, household appliances, open doors, tune a radio and the TV sets, computers and so on. The HMD I was playing on allows for a playing area of*

about 3 m x 3 m so I could walk, crouch and move within that designated physical space. These movements were often accurately mapped onto the virtual world and were fairly seamless bar some occasional glitches. This created a convincing sense of immersion,⁶ enhanced by a detailed, photorealistic scenography. The only parts of the avatar's body I could see were her hands, responding to my actual hand and finger movements. This felt like an uncanny body transfer illusion at first but then it began to feel somewhat 'natural' due to the practicality of grabbing objects and interacting with the world through virtual hands. There is something very reaffirming and emotionally binding in the act of looking at one's 'own' hands and moving fingers even if this is experienced in virtual reality.

The feeling of a 'natural' connection between my material hand and its virtual representation can be partly explained by the concept of proprioceptive musculo-skeletal mapping, which is part of the game's interoceptive design. I slowly began forming a bond with the avatar through these small acts of embodiment and the virtual hands became a kind of prostheses—an instance of 'proprioceptive drift' (Jarvis 2017: 35) towards the avatar.

As the narrative progressed, I (as Alyx) found out from the members of the resistance that my father was captured for questioning and was asked to rendezvous with the rest of the group to plan a rescue mission. I made my way to the basement via an elevator. As it started moving downwards, the visual stimuli triggered an automatic response in my legs to counteract the 'phantom G-force' of the elevator even though there was no actual one—an interoceptive/synaesthetic effect analogous in nature to Ramachandran's (1996) phantom limb mirror experiment. While hiding in the basement I could see, through a ground window, civilians being rounded up by the Combine guards. The guards were life-size in scale, wore ominous masks and acted brutally towards civilians. The sheer proximity and embodied perception of the scene was disconcerting to the point where I started to feel a flight-or-fight response. I had no weapons at this point in the game, which made me defenceless and vulnerable. I ran back to the elevator and as I arrived on the ground floor the doors opened to a group of guards pointing guns at me and

⁶ Immersion can be understood here in the sense that Janet Murray defines it as a 'sensation of being surrounded by a completely other reality... that takes over all of our attention, our whole perceptual apparatus' (1997: 98).

shouting at me to stand still and raise my hands. I panicked and instinctually did so. I felt my heart race, started sweating and felt goosebumps. A drone flew in and scanned me with a laser beam. I felt blinded since it pointed the beam straight at my eyes. It felt very unpleasant, so I turned away. Then a monstrous android guard came up close to me and punched me in the face. My avatar lost consciousness; I took off the headset...

I must admit I felt traumatized at that point. When I took off the headset and looked at the game on the monitor, it appeared *just* to be a videogame. Similar to the flying sensation in *Goodnight, Sleep Tight*, in VR there was an unconscious part of my brain, my automatic nervous system, which was convinced that the action around me was *actually* happening, placing me in a flux of perceived sensory/affective *reality* on the one hand and an awareness of the constructed/artificial nature of the virtual fiction towards which I ‘drifted’. This reaffirmed Brian Massumi’s argument that the virtual can be understood as ‘complementary to the actual’, as a potentiality and ‘dimension of reality, not its illusionary opponent’ (2014: 55); and as Harry Wilson pointed out quoting Massumi: ‘virtual things make themselves felt, they make a “forceful difference” they are “effectively real”’ (2020: 15).

The interoceptive dramaturgy at play in the first chapter of the game escalated interoceptive sensations from a gentle beginning to a stressful encounter with the *Combine* guards. Anil Seth (2013) argues that interoceptive sensations heighten a sense of embodiment and thus reinforce a connection with the avatar. When on the balcony I was given the opportunity to interact with the environment and establish an embodied relationship with the protagonist’s avatar through proprioceptive aesthetics. Simple actions such as picking up crates and opening doors contributed to this because they provided exercises in real-space/virtual-space coordination.

The game design implicitly treated me like a toddler at this stage, before moving to more complex motor-sensory tasks. This was followed by more disorienting sensations like the ‘phantom G-force’ in the lift and culminated with an invasion of personal space during the encounter

with the guards, a space that Frederique de Vignemont calls ‘protective space’ (2018: 179–80). The invasion triggered in me a sense of panic and a fight-or-flight response. After all, I was trapped in an elevator.

The soundtrack at that point morphed from atmospheric drone-like harmonic masses into heavy, distinct, fast rhythms, accentuated with dissonant staccato chords. Partly a cinematic convention of the genre, but also another mode of entrainment by design, it increased my heart rate, eliciting a sense of danger and urgency.

The motif of having one’s ‘protective space’ invaded is common throughout the game and part of the survival horror genre (Perron 2009: 131). There are many moments when one is ambushed by zombies, or face-eating alien creatures,⁷ usually in dark claustrophobic tunnels with a limited field of vision. Turning one’s head abruptly or pointing a flashlight has to be performed physically for the motion controllers to register. One has to perform and embody a state of panic or embody aggressive actions in order to survive and/or fight back. This embodiment in turn affects the sympathetic nervous system, adrenaline levels and interoceptive sensations. Commenting on full-body illusions, Jarvis argued that ‘[o]ne’s externalized virtual doppelganger... becomes an internalized “me”, co-exposed along with the participating body to all kinds of virtual and viscerally felt “threats”’ (2019: 134). Arguably, the game thus had an interoceptive dramaturgy carefully designed to co-expose the player’s body to a structure of threatening sensations through an instrumentalization of the nervous system. There were also various dramaturgical strategies designed to lower potential anxiety levels in the player. For instance, one of the members of the resistance, Russell, assists Alyx remotely from a base. He can see and hear what she (the player) does through a headset communication device and sometimes comments on what is happening or gives tips, functioning like a ‘surrogate audience’ (Wilson 2003: 1)—a momentary mediator—creating a distance effect between the often immersive terror of the environment and the player’s experience⁸. This acts like a strategy for mitigating stress induced in the player and provides some necessary relief.

⁷ Alien spider-like face-eating creatures tend to attack by jumping on the player’s face.

⁸For example, he will tell jokes or stories in order to alleviate stress before or after stressful encounters.

Other instances of this kind of mitigation are geometric puzzles dispersed throughout the game that the player has to complete in order to progress. They are inventive and aesthetical, tasking the player to re-arrange geometric figures in space. This often requires manipulating and tracing geometries in physical space, quite often using the player's whole body. These puzzles reminded me of some of Rudolf Laban's exercises such as those described in *Choreutics* (1966), which structure movement geometrically. This patterned structuring of movement and gesture in the puzzles required comprehensible cognitive engagement and precision, which in turn reduced stress and normalized interoceptive sensations before anxiety levels were again provoked in subsequent scenes.

Unlike *Goodnight, Sleep Tight* the interoceptive dramaturgy of *Half-Life: Alyx* was not self-reflexive by design. Its carefully crafted and sophisticated interoceptive dramaturgy was designed to instigate and heighten more distressing sensations such as those of fear, anxiety, stress and even torture by making the player/participant vulnerable and exposed to the caveats of its elaborate virtual environment.

PLAYERS/PARTICIPANTS AS 'SURROGATE-SELVES'

Following Jarvis's insight, I contend that in both of the analyzed cases players/participants are construed and perform as 'surrogate selves' of their respective avatars (Jarvis 2019: 226). This particular re-positioning of the experiencer in relation to the avatar offers a point of departure to consider the ethical dimension of the ways in which interoceptive dramaturgies have been implemented in both cases.

In her article 'Interactivity or interpassivity: A question of agency in digital play' Laetitia Wilson (2003: 1) uses Slavoj Žižek's (1998) concept of the interpassive object, sometimes referred to as the 'surrogate self', to argue that in computer games the avatars can be acting, experiencing or even suffering on their behalf. She argues that

[t]he 'surrogate self' of interpassivity can be understood as an interpassive entity or device; an

'interpassive object'. The user engages with the digital space via this mediating virtual or material object [that] can be understood as a 'stand-in' for our real-space selves. (Wilson 2003: 1)

Wilson claimed that the chorus in classical Greek theatre and sitcom canned laughter are examples of the 'surrogate self'. They function both as a means of mediating a potential affective charge of a scene, if it is 'too much' for an audience to experience, and a means of regulating and prompting specific audience responses. Wilson argues that the avatar in computer games acts, feels and suffers on the players' behalf so that they don't have to. How does this logic apply to performative VR environments? Jarvis argues that in many cases of commercial applications of VR such as in videogames this logic is 'troublingly inverted' (2019: 228). He argues that immersive experiences in these environments ascribe 'to a hyperreal reversal that reconceptualizes their players' bodies as the surrogates for our non-human counterpart's often traumatic virtual experiences' (ibid.). These experiences are not a matter of mere illusion. As recent studies have shown, 'torture in a virtual environment is still torture. The fact that one's suffering occurs while one is immersed in a virtual environment does not mitigate the suffering itself' (Madary and Metzinger cited in Jarvis 2019: 226).

Arguably this logic applies to both of the case studies, albeit in different ways, where the player/participant becomes a 'surrogate self' and is elicited to experience some kind of unmitigated suffering, torture, trauma through an interoceptive dramaturgy on behalf of an avatar. In *Goodnight, Sleep Tight* this was an out-of-body experience coupled with a meditation on mortality amounting to some degree of existential suffering. In *Half-Life: Alyx*, due to its genre, the interoceptive sensations comprised of elevated distress amounting to a carefully structured symphony of terror.

ETHICS OF PERCEPTION

It is important to consider the ethical implications of this inverted dynamic and of the instrumentalized sensorial manipulation resultant from it. I address these implications

by considering them from the perspective of the hierarchy of the senses, interoceptive montage and the parasitic nature of VR experiences.

Archaeologist Yannis Hamilakis (2013) argued that in Western culture the five senses (sight, sound, touch, smell and taste) are the perceptual modalities of which people are most conscious and that people have the widest vocabulary and discursive ability to describe (sight and sound being the most dominant perceptual modalities). Historically in Western culture, interoceptive modalities do not have such extensive articulation. Even scientific discourses in this area are relatively recent. Consequently, processing interoceptive sensations in order to gain a critical distance from a VR encounter can be a compromised experience. This lack of conscious discursive hold of interoception leaves wide open the possibility of manipulating and exploiting a participant's/player's perceptual modalities. I felt that this was the case with *Half-Life: Alyx*, during the ambush scene, but also in *Goodnight, Sleep Tight* during the flight, although the latter had purposefully built-in glitches and self-reflexive poetic commentary to instil moments of distancing. Many studies have shown that the hierarchy of the senses is a cultural construct. A culture-specific hierarchy of senses may leave users without the perceptual awareness needed to critically recognize and assess potential interoceptive manipulation. This fact renders the ethical risks mentioned here contingent on cultural training.

Turning to the topic of montage, I am interested in the limits of discontinuities as a form of impossible montage. Sergei Eisenstein explores such limits in cinematic montage in his essay titled 'Laocoön' (1991). He compares cinematic montage to the statue of Laocoön. More specifically, he 'argues that the postures of the figures in the classical statue of Laocoön and his sons represent an impossibility, because all the different contortions of the bodies, the expressions and gestures [of pain] would never occur within an instant' (Woycicki 2014: 71). Thus, the statue represents an 'impossible' embodiment of suffering. If we apply this logic to the montage of the interoceptive dramaturgy in the case studies, the body of the participant/player becomes subject to a structuring of

interoceptive sensations, which is akin to the logic of the montage inherent in the statue—metaphorically speaking an 'impossible' montage sequence of stimulated sensations. This becomes a form of disciplining the body through an instrumentalization of the sensory system for aesthetic purposes. If interoceptive sensations triggered by VR experiences are often automatic and cannot be easily overridden with conscious effort, what kind of ethical responsibility lies on the part of the designers when considering the limits of these experiences? Both *Half-Life: Alyx* and *Goodnight, Sleep Tight* had mitigating strategies that tethered the participant/player to a more 'homoeostatic', embodied reality allowing them to calm down and relax. In both cases, however, I felt that my agency and ability to respond was compromised.

The parasitic nature of VR can make the medium feel interoceptively invasive, thus making the experiencer an exposed target. For the purpose of discussion, it is relevant to consider three meanings of the term 'parasite' as outlined by Karen Juers-Munby in her chapter on Elfriede Jelinek's 'parasitic plays'. She defines the term parasite as

[f]irst, the social parasite who exploits the hospitality of others; secondly the biological parasite who feeds on another organism and weakens it... and thirdly... a form of static or interference that is noise on the channel of communication. (Juers-Munby 2013: 216)

First, the VR apparatus taps into a whole history of embodied experiences of the 'host', exploits their 'hospitality' and relies on behaviours coded within the nervous system to stimulate interoceptive responses, for example, those of being a 6-year-old child tucked into bed in the case of *Goodnight, Sleep Tight*. Second, in both cases I also felt vulnerable and weakened. This was very clear in *Half-Life: Alyx* where due to the scarcity of resources I often felt under threat. In *Goodnight, Sleep Tight* inhabiting a body of a child avatar also positioned me as a vulnerable experiencer. Third, in both examples the VR HMD interfered with the way I would normally inhabit physical space. It 'hijacked' my sensorial engagement with material reality in order to engage my nervous system with the VR environment. This parasitic relationship is

ethically problematic due to the manipulation that it allows. However, as discussed before, the interference aspect of it can be used to disrupt immersive manipulatory states, enabling a more distanced, self-reflexive perceptual experience. For example, in *Half-Life: Alyx* Russel's remote commentary interferes with the immersive experience, creating a sense of distance from the action.

VR performances offer a unique opportunity to explore and foreground interoceptive dramaturgies due to the way they can elicit intense immersive experiences. There is interesting potential for performative VR environments to become 'perceptual playgrounds' for these experiences. At the same time, the relatively unmitigated stimulation of the sensory system in these performances, echoing Artaudian strategies, poses ethical questions when one considers the resultant degree of vulnerability and exposure of the player/participant. Both of the case studies in this article demonstrate that there is a wide spectrum of perceptual modalities through which we engage with reality and that different perceptual channels (senses) expose us and make us vulnerable to our environments in different ways, consequently carrying different ethical implications. As the use of VR becomes more prolific within contemporary theatre/performance making and videogames, it will be paramount to pay attention to the *ethics of perception* inherent in VR experiences and in particular to those pertaining to interoceptive dramaturgies, which to a great extent define this medium.

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