

What Good (and Bad) is VR?

Abstract

This paper discusses ethics around the creation of virtual reality experiences, through a critical examination of the allowances the medium offers to creative practitioners. It suggests that, while virtual reality was initially celebrated as “the ultimate empathy machine”,¹ a robust argument can be made for VR’s capacity to desensitise participants.

Looking at the use of virtual reality for journalism, it acknowledges that the early novelty of VR has exposed (particularly affluent) audiences to stories of humanitarian crisis, and explores the implications of desensitisation and compassion fatigue of the audience to the subject.

Examples are given of VR for cue/exposure therapy for treatment of phobias and addiction, habituating muscle memory, management training experiences for effectively firing workers, and scenario drilling activities in simulated high-stress environments such as industrial safety and military applications. Military simulation VR is explored further in the context of desensitisation and the historical development of military training with reference to Dave Grossman’s book *On Killing*, arguing that in stark contrast to an ‘empathy machine’, its use allows for training that reduces empathy and the hesitation to kill.

Keywords

virtual reality, tech ethics, empathy, journalism, compassion fatigue, desensitisation, addiction, phobias, conditioning, training, habituating, kinaesthetic bleedthrough, military simulation, drilling, killing

Introduction

This paper explores the allowances virtual reality offers to creative practitioners, looking beyond the early claim of “ultimate empathy machine”.¹ In the following, we will explore current applications and research around VR, and ethical implications around a reframing of the allowances of the medium.

Beyond “The Ultimate Empathy Machine”

The now well-known term ‘empathy machine’ was coined by Robert Ebert to describe the medium of film. In 2015, an interactive filmmaker Chris Milk gave a TED talk where he suggested that VR could be the ultimate empathy machine; allowing the audience to see through other people’s perspectives, prompting them to develop a strong sense of empathy.¹

Bevan et al. have identified a number of elements as important for the development of empathy in the

composition of virtual reality nonfiction experiences. Compositional elements include i) a viewer’s role in the experience: passive observer, active observer, passive participant, active participant, ii) Point of View: first person, fly-on-the-wall, ‘omniscient’ iii) visual composition: whether it’s in CGI 3d or 360 or e.g. photogrammetry, iv) audio composition: spatial audio, binaural sound, non-diegetic score, etc., v) gaze manipulation, vi) evidence of embodiment e.g. seeing your arms, vii) interaction, viii) locomotion, ix) interpersonal space: the presence of other people within the world, and x) the manipulation of time.²

This concept has been developed for immersive journalism, as an attempt to report on situations around the world in a more emotionally engaging way, producing deeper empathic responses.³ News organisations that were early adopters of VR include The Guardian, The New York Times, the BBC, and Al-Jazeera, and these experiences have included a reconstruction or simulation of solitary confinement, in a VR work called ‘6x9 virtual experiences, solitary confinement’.⁴ Similarly, expressive video works have explored a similar emotionally engaging, nonfiction storytelling role, e.g. Lynette Wallworth’s *Collisions*, an account by indigenous elder Nyarri Nyarri Morgan of his witnessing of an atomic bomb test on Martu land in the remote Western Australian desert.⁵

Similar thinking is being used in the development of VR for diversity and inclusion training, where participants take the POV of a target of discrimination as a way of developing empathy and understanding.⁶

Critical research around this talks about the muddiness of the term ‘empathy’, and some scholarship around the use of VR for producing empathic responses has talked more about the experiences as ‘perspective-taking machines’; suggesting the experience of taking different perspectives, regardless of the content of the work itself, allows people to have more of a sense of general empathy.⁷ In exploring the potential for creating these different perspective-taking experiences, they look at properties of the experiences such as ‘immersion’, ‘presence’, ‘engagement’, ‘illusion of body ownership’, and ‘agency illusion’.⁸

From here, you can get a sense of the use of VR to create an experience that gives insight into others’ lived experience. One critique of this approach is its potentially tokenistic nature.⁹ It’s necessary for there to be a mediation from the designer of the experience; it’s not a direct relationship with the subject. It might be, for example, the communication of disability as an experience in which an able-bodied person is being restricted in a certain way, which produces a sense that a disability is a modification to

a normative body and not a totally different way of experiencing the world.¹⁰ This critique has come out of commentary on experiences like *notes on blindness*, that only really gives a sense of what it's like to have suddenly become blind rather than growing up blind.

In stark contrast to the argument for VR as empathy machine is an immersive experience training managers to fire their employees, where a virtual employee will start to cry or become angry if you fail to respond adeptly to their emotional cues.¹¹ This particular VR experience is developed to effectively reduce the empathic sensitivity of the manager to the emotional state of the employee.

Desensitising: Addiction / Phobia / Pain-relief

Thinking about this desensitising aspect of VR, there are many examples: it's used for treating phobias,¹² for example arachnophobia, through immersion therapy¹³. In this example "...patients might start by seeing a small virtual spider far away [...] later, they can work up to being at ease, doing larger spiders up close" leaving the patient less agitated and distressed by the existence of the spider over time.¹⁴ It's also been used for exposure therapy for other types of phobias, fear of flying, for example, where they simulate taxiing and flying in bad weather,¹⁵ and to treat various drug addictions, where patients are exposed to environmental stimuli that will trigger cravings, for example, a pub scenario or around treatment of various forms of drug addiction,^{16,17,18} similarly for online gambling addiction.¹⁹

In all of these cases, virtual reality is used to present the patient with a particular scenario and desensitised their response to that scenario. Notably, an early use of virtual reality successfully reduced perceived pain for children receiving serious burns treatment, where they would be placed in an environment called *SnowWorld* and the experience of the virtual world reduced their subjective experience of pain during the treatment.²⁰

Conditioning / Training

Addiction and phobia treatment could be described as habituating a participant to a particular scenario. As with first person games, virtual reality is also effective at training, which goes beyond the framing of 'desensitising'. VR has been successfully used in mining safety training,²¹ in the training of submariners to have spatial awareness and a knowledge of their work environment,²² and in military training. It's also used in physical therapy and rehabilitation for people with strokes or children with cerebral palsy, as a way of giving a particular type of feedback and developing neuro-plasticity for overcoming certain motor neuron difficulties.²³

This conditioning or training element of VR echoes subjective experiences of going into VR that one paper calls "kinesthetic bleed-through", where after time in an immersive experience, on taking off the headset, ones

embodied understanding of the real world is altered.²⁴ In one example, a VR experience that was in black and white gave the researcher an acute sense of colour on leaving it – their sense of the world temporarily changed.

Elsewhere this experience of going into VR and having a conditioned response to it is described as entering a 'space of potentiality' where you proprioceptively build a new way of connecting to the world. This is similar to the concept of "landing sites" that theorists Awakawa and Gins have described in their book *The Architectural Body*,²⁵ where they say the distinction between one's sense of one's body and the environment are actually very close, and co-created out of a sense of what one's body can do in an environment.²⁶ For example, if you're a climber, you might see, interpret, and bodily understand a cliff-face as something that you can climb up instead of an obstacle.

This idea of conditioning can be seen as a similar experience of building new ways of connecting in an environment with your body. VR experiences described as kinesthetic bleedthrough is very similar to an experience that I had in my youth, having never skateboarded, of playing Tony Hawk's the computer game; leaving the game and heading outside I had a bodily sense that a handrail down a set of stairs was something that I could grind a skateboard off of.

Case Studies

In further exploring different ways of understanding VR's allowances, I will explore two novel creative virtual reality art experiences, two works commissioned by Australia Centre for Moving Image (ACMI) over 2018 - 2022.

Artist Joan Ross's 2018 commission was interesting in its use of the audience's expectation of VR as a 'playground' to mediate how they behaved in a space and generate the meaningful experience of the work. Ross's practice explores Australian colonial history often with dark humour. Rather than trying to make participants feel empathy or understand someone else's perspective, it co-opted them into behaving a certain way. At the end of the experience participants looked back and reflected on their actions and consequences with a reframed perspective. They would arrive in an environment which was effectively a beautiful natural environment, and they were faced with a variety of different ways of interacting with it. These interactive allowances appeared like fun toys, but when used would subtly produce negative outcomes in the world. Once the participants had finished, they could look back and see that it was their assumption of being able to take control and change everything in that world that led to the negative outcome.²⁷

In Tully Arnot's 2021 Acme commission, participants were given a non-human perception of the world by actively restricting the visual element of the VR experience and focusing on fields of colour and light and spatialized sound. In doing so the participants were forced to develop

a sensitivity to the sound by frustrating the visual element.²⁸ *Epiphytes* contrasted with experiences like *notes on blindness*,²⁹ where sounds being perceived build up a visual picture to create an analogy of what it's like to understand surroundings through that sound. In this experience the focussed visual element is entirely cut, and the participant is forced to develop a sensitivity to the audio space at the same time as presenting a very highly detailed spatial soundscape. That gives them the ability to understand it purely from the audible without visual metaphors for the process.

Novelty and Literacy in VR Experiences

It's important to acknowledge that significant focussed engagement in virtual reality works can be attributed to the early novelty of the technology. The idea that VR can be very effective in communicating different perspectives could be a function of the attention economy and the fact that people were more inclined to experience novel technologies they'd never used before; regardless of the 'content', the experience was implicitly interesting. This isn't necessarily a negative for virtual reality, and an allowance of emerging technologies still includes this element, that can be taken advantage of for good. The author has been involved in a research project using VR for engaging kids in the Talking About Tobacco Use (TATU) program, and its design acknowledged that engagement would be good because of its novelty. The baseline of engaging tech art experiences may be high, but not necessarily because of what virtual reality provides *per se*, but because they're novel and interesting, and people will make time for them.

The concept of compassion fatigue, as discussed in photo-journalism, hints at a possible mechanism that could further impact the ability of virtual reality experiences to elicit an empathic response in applications such as immersive journalism.^{30,31}

It's also clear in descriptions of the properties and compositional elements of VR experiences that they're not exclusive to virtual reality. For example, the description of 'immersion', 'presence', 'engagement', 'illusion of virtual body ownership', etc. are elements present in first-person games or even third person games.

I suggest that the power of virtual reality isn't to radically change the modality or type of experiences that you can have – and that's clearly the case, given that the tools that you use for making computer games are the same as the ones that you make for virtual reality – but the level of literacy needed to be able to experience certain things without being distracted, with an intuitive understanding of what's going on instead of a literal bodily sense of what's going on, means that it brings it to a wider audience.

VR, Video Games, Violence, and Killing

Regarding VR as 'ultimate empathy machine', it's worth reflecting on the adjacent discussion of video games, having been blamed for contributing to a more violent society. While there's evidence of videogames conditioning visual-spatial and twitch reflexes associated with gun violence,³² there's no clear agreement on whether they promote more violent behaviour.^{33,34}

That said, in the context of virtual reality's use for combat training we can be less ambiguous. The book *On Killing*, by retired United States Army lieutenant colonel Dave Grossman, describes the historical resistance to killing and low fire right rates amongst rifleman in the first and second world war, and the US Army's concerted efforts to change that via conditioning, desensitisation, and what Grossman calls 'denial defence'.³⁵ Grossman identifies the use of operant conditioning through the process of simulated warfare, where every aspect is rehearsed, visualise and conditioned to the point of where soldiers might respond to a real world situation before they're even aware that it's not a simulation. Some of this training is reflected in decisions like swapping out the abstract bullseye target for the silhouette of a human figure.

We can comfortably side-step the question of violence in videogames knowing that the intended goal of military VR experiences is to condition soldiers to respond without hesitation; the use of training simulations has the intention of being enacted in warfare. Given that university virtual reality programs are run in close partnership with the military, in summary I'd like to suggest that through VR's allowances for conditioning and desensitisation, combat simulation experiences not only act in direct opposition to the claim of VR as "ultimate empathy machine", but should draw scrutiny around research ethics.

References

- [1] TED. "How Virtual Reality can Create the Ultimate Empathy Machine." TED Presentation. Accessed January 14, 2024. [URL]
- [2] Bevan, Chris, David Philip Green, Harry Farmer, Mandy Rose, Kirsten Cater, Danaë Stanton Fraser, and Helen Brown. "Behind the curtain of the "ultimate empathy machine" on the composition of virtual reality nonfiction experiences." In *Proceedings of the 2019 CHI conference on human factors in computing systems*, pp. 1-12. 2019.
- [3] Bujčić, Mila, Mikko Salminen, Joseph Macey, and Juho Hamari. "'Empathy machine": how virtual reality affects human rights attitudes." *Internet Research* (2020)
- [4] Plager, Trenton, Ying Zhu, and Douglas A. Blackmon. "Creating a VR Experience of Solitary Confinement." In *2020 IEEE Conference on Virtual Reality and 3D User Interfaces Abstracts and Workshops (VRW)*, pp. 692-693. IEEE, 2020.
- [5] Dooley, Kath. "Scripting the virtual: Formats and development paths for recent Australian narrative 360-degree virtual reality projects." *Journal of Screenwriting* 9, no. 2 (2018): 175-189.

- [6] Georgiadou, Andri. "Equality Inclusion and Diversity Through Virtual Reality." In *The Palgrave Handbook of Corporate Sustainability in the Digital Era*, pp. 181-193. Palgrave Macmillan, Cham, 2021.
- [7] Wimmer, Jeffrey. "The "Ultimate Empathy Machine" Revisited." *Games and Ethics* (2020): 129-142.
- [8] Barbot, Baptiste, and James C. Kaufman. "What makes immersive virtual reality the ultimate empathy machine? Discerning the underlying mechanisms of change." *Computers in Human Behavior* 111 (2020): 106431.
- [9] Fisher, Joshua A. "Empathic actualities: toward a taxonomy of empathy in virtual reality." In *International Conference on Interactive Digital Storytelling*, pp. 233-244. Springer, Cham, 2017.
- [10] Silverman, Arielle M., Jason D. Gwinn, and Leaf Van Boven. "Stumbling in their shoes: Disability simulations reduce judged capabilities of disabled people." *Social Psychological and Personality Science* 6, no. 4 (2015): 464-471.
- [11] Heft-Luthy, Sam. "The Myth of The "Empathy Machine".
The Outline (2019).
- [12] Parsons, Thomas D., and Albert A. Rizzo. "Affective outcomes of virtual reality exposure therapy for anxiety and specific phobias: A meta-analysis." *Journal of behavior therapy and experimental psychiatry* 39, no. 3 (2008): 250-261.
- [13] Fogg, Brian J. "Chapter 4 - Computers as Persuasive Media: Simulation," in *Persuasive technology: using computers to change what we think and do*. Ubiquity 2002, no. December (2002): 61-87.
- [14] Garcia-Palacios, Azucena, Hunter Hoffman, Albert Carlin, Thomas A. Furness III, and Cristina Botella. "Virtual reality in the treatment of spider phobia: a controlled study." *Behaviour research and therapy* 40, no. 9 (2002): 983-993.
- [15] Brinkman, Willem-Paul, Guntur Sandino, and Charles Van Der Mast. "Field observations of therapists conducting virtual reality exposure treatment for the fear of flying." In *ECCE*, p. 18. 2009.
- [16] Ghiță, Alexandra, Lidia Teixidor, Miquel Monras, Lluïsa Ortega, Silvia Mondon, Antoni Gual, Sofia Miranda Paredes et al. "Identifying triggers of alcohol craving to develop effective virtual environments for cue exposure therapy." *Frontiers in psychology* 10 (2019): 74.
- [17] Bordnick, Patrick S., Hilary L. Copp, Amy Traylor, Ken M. Graap, Brian L. Carter, Alicia Walton, and Mirtha Ferrer. "Reactivity to cannabis cues in virtual reality environments." *Journal of psychoactive drugs* 41, no. 2 (2009): 105-112.
- [18] Yuan, Yue, Jing Huang, and Ke Yan. "Virtual Reality Therapy and Machine Learning Techniques in Drug Addiction Treatment." In *2019 10th International Conference on Information Technology in Medicine and Education (ITME)*, pp. 241-245. IEEE, 2019.
- [19] Park, Sung Yong, Sun Mi Kim, Sungwon Roh, Min-Ah Soh, Sang Hoon Lee, Hyungjin Kim, Young Sik Lee, and Doug Hyun Han. "The effects of a virtual reality treatment program for online gaming addiction." *Computer methods and programs in biomedicine* 129 (2016): 99-108.
- [20] Hoffman, Hunter G., David R. Patterson, and Gretchen J. Carrougher. "Use of virtual reality for adjunctive treatment of adult burn pain during physical therapy: a controlled study." *The Clinical journal of pain* 16, no. 3 (2000): 244-250.
- [21] Filigenzi, Marc T., Timothy J. Orr, and Todd M. Ruff. "Virtual reality for mine safety training." *Applied occupational and environmental hygiene* 15, no. 6 (2000): 465-469.
- [22] Stone, Robert. "Virtual reality for interactive training: an industrial practitioner's viewpoint." *International Journal of Human-Computer Studies* 55, no. 4 (2001): 699-711.
- [23] Cheung, Katharine L., Eugene Tunik, Sergei V. Adamovich, and Lara A. Boyd. "Neuroplasticity and virtual reality." In *Virtual reality for physical and motor rehabilitation*, pp. 5-24. Springer, New York, NY, 2014.
- [24] Kozel, Susan, Ruth Gibson, and Bruno Martelli. "The weird giggle: attending to affect in virtual reality." *Transformations* 31 (2018): 1-24.
- [25] Gins, Madeline, and Shusaku Arakawa. *Architectural body*. University of Alabama Press, 2002.
- [26] Prohm, Alan. "BUILDING BODY: TWO BRIEF TREATMENTS ON LANDING SITE THEORY." *The Funambulist Papers* 2, (2015): 204-211
- [27] Munro, Kim. "Destructive pasts, hopeful possibilities: The simulated environment in'awavena and did you ask the river?." *Metro Magazine: Media & Education Magazine* 201 (2019): 82-85.
- [28] Arnot, Tully. "Epiphytes." (exhibition of virtual reality work) Australian Centre for the Moving Image, Melbourne. November 2022.
- [29] Hunt, K. J. "Notes on blindness: sensory cinema and the beauty of cognition." *The Huffington Post* (2016).
- [30] Campbell, David. "The myth of compassion fatigue." In *The violence of the image*, pp. 97-124. Routledge, 2020.
- [31] Midberry, Jennifer. "Compassionate Horror or Compassion Fatigue? Responses to Human-Cost-of-War Photographs." *International Journal of Communication* 14 (2020): 22.
- [32] Phillips, Amanda. "Shooting to kill: Headshots, twitch reflexes, and the mechropolitics of video games." *Games and Culture* 13, no. 2 (2018): 136-152.
- [33] Uhlmann, Eric, and Jane Swanson. "Exposure to violent video games increases automatic aggressiveness." *Journal of adolescence* 27, no. 1 (2004): 41-52.
- [34] Ferguson, Christopher John. "The good, the bad and the ugly: A meta-analytic review of positive and negative effects of violent video games." *Psychiatric quarterly* 78, no. 4 (2007): 309-316.
- [35] Grossman, Dave. *On killing: The psychological cost of learning to kill in war and society*. Open Road Media, 2014.