



Virtual Realities

Case Studies in Immersion
and Phenomenology

Stuart Marshall Bender & Mick Broderick



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“*Virtual Realities* provides an engaging, wide-ranging tour of virtual reality and beyond; with a good eye for balanced appraisal, careful consideration, and understanding of VR in context. A nuanced guide to evaluating VR applications, with an important emphasis upon direct experience and the potential to help researchers and developers produce experiences capable of instigating more meaningful change in the world.”

—Tom Garner, *University of Portsmouth*

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Stuart Marshall Bender
School of Media, Creative Arts
and Social Inquiry
Curtin University
Bentley, WA, Australia

Mick Broderick
School of Media, Creative Arts
and Social Inquiry
Curtin University
Bentley, WA, Australia

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ABBREVIATIONS

AI	Artificially intelligent/artificial intelligence
AR	Augmented reality
CG	Computer-generated
CGI	Computer-generated imagery
CVR	Cinematic virtual reality
fEMG	Facial electromyography
FRVR	Free roam virtual reality
HCI	Human–computer interaction
HMD	Head-mounted display
ISPR	International Society for Presence Research
Mil-sim	Military simulator
MR	Mixed reality
MST	Military sexual trauma
PE	Prolonged exposure (therapy)
PI	Place illusion
PSI	Plausibility illusion
PTSD	Post-traumatic stress disorder
SCL	Skin conductance level
USCICT	University of Southern California Institute for Creative Technologies
UX	User experience
VISOR	Visual instrument and sensory organ replacement
VR	Virtual reality
VRET	Virtual reality exposure therapy

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Introduction

READY, VIRTUAL REALITY CONSUMER

The 2018 release of Steven Spielberg's film *Ready Player One* was heralded as potentially reinvigorating public interest in virtual reality (VR) as a consumer product. Characters in the dystopian narrative don headsets that immersively transport them to a virtual environment called The Oasis (Fig. 1.1). In addition, the characters are shown wearing haptic gloves and suits that complete the immersive illusion of The Oasis, for instance providing the sensation of the lead character's chest and crotch being touched by the virtual avatar of his female crush.

The spectacular imagery of the film and its imaginative presentation of the immersive capacities of VR led to many industry commentators speculating that the film might usher in the VR zeitgeist and provoke mass adoption of the technology by consumers. For example, screen industry bible *Variety* claimed that it "could serve as a catalyst for the virtual-reality market" (Spangler, 2018). Recent years have been highly disappointing for the VR industry, with consumer uptake of the technology falling far short of the hype and expectations, although Mark Gurman from Bloomberg predicted that Spielberg's film would help boost consumer VR sales in 2018 by 25 per cent (Gurman, 2018). Indeed, it appears that VR sales did increase by approximately 25 per cent in 2018, and 29 per cent in 2019 (Statista, 2021), although it is impossible to attribute this solely



Fig. 1.1 Spielberg's vision of a VR future in *Ready Player One* (2018). Note the stereotypical look of 'awe' and hand-reaching gesture from the character, the latter motif self-consciously adopted for this book's cover image

to the release of *Ready Team One*. Paul Tassi from *Forbes* argued that the problem with consumer interest in VR:

is not that people don't think VR is fun or cool. It's that it costs a lot of money, and that the tech in its current form is far more cumbersome than what's featured in a movie like *Ready Player One*. (Tassi, 2018)

Many commentators exhibit a tendency to forget that, for more than a century, screen entertainment industries have consistently embraced new technologies such as the introduction of sound, zoom lenses, 3D photography (Schedeen, 2010), Cinerama (Bordwell, 1997), surround sound (Kerins, 2011), Imax (Brown, n.d.) and computer-generated imagery (CGI; Prince, 2012). Most of these technological enhancements were met with varying degrees of evangelical excitement, heralding a new era of audience and spectator entertainment. Such hucksterism has emerged over computer games, the creation of html, web 2.0, online avatar communities such as Second Life, and social networking. While it would be foolish to conflate these mediums, their associated platforms and variant historical trajectories, there is a commonality evident in the way these

technological innovations are anticipated and marketed, especially now with subjective user immersion via VR environments and devices.

It is odd that Spielberg's film, set in 2045, is superficially *less* visually creative in the technology it presents than his earlier *Minority Report* (2002) which imagined a 2050s future replete with transparent, holographic displays using virtual and haptic interfaces. Hence, *Ready Player One* appears inherently anachronistic in its projection of futuristic screen immersion and interactivity, something Ray Bradbury's *The Velt* (1950/1972) and *Fahrenheit 451* (1953) envisioned in the 1950s—both works later were adapted for film in 1969 and 1966 respectively. *Ready Player One*'s vision of tomorrow juxtaposes a grimy, overpopulated and dystopian Columbus Ohio with The Oasis VR realm, a space filled with avatars drawn from pop culture and Spielberg's own back catalogue, all inhabiting the movie's Uncanny Valley (Mori et al., 2012).¹ Unlike the immersive VR headsets and interfaces of its movie antecedents—such as *Videodrome* (Cronenberg, 1983) or *The Lawnmower Man* (Leonard, 1992)—the cyclopean displays worn by the actors are more akin to the cheesy VISOR (visual instrument and sensory organ replacement) used by a principal character in *Star Trek: The Next Generation* (1987–94). Given the amount of CGI, it is also odd that the studio did not mass release this film only as a 3D theatrical or Blu-ray experience in order to better emulate the movie's immersive VR narrative. Arguably, the reliance on a conventional 2D screen representation of a VR world speaks to the medium's inability to effectively register the 'immersive' environment via a standard theatrical experience.

While it is unlikely that even a major blockbuster such as *Ready Player One* is enough to shift consumers' interest in buying VR equipment for home use, it is clear that the industry hopes each iteration of VR entertainment technology will finally break through to the consumer mass market. For example, in mid-2019 when Facebook's Oculus company released the Oculus Quest, a relatively cheap, self-contained VR headset capable of room-scale immersion without being tethered to a high-performance desktop PC, many popular technology writers speculated that it would enable greater access to VR for people who had been intrigued by the promise of immersion but were put off by the clunky hardware and need for expensive computers (Bloomberg, 2018; Woozer, 2018).

Arguably, the current hype around VR cannot be sustained by the actual technology offered by various headset manufacturers and software developers, and indeed some of the resurgent hype of VR has come under

scrutiny. From the perspective of VR-based tourism, Janna Thompson (2018) recently argued that “it will never be a substitute for encounters with the real thing”. Yet many of the evangelical claims about VR are centred on the notion that it will be of great personal and social benefit. One of the key ideas in this space is derived from Chris Milk’s inflated 2015 TED talk claim that VR represents “the ultimate empathy machine” (Milk, 2015). For Milk, a visual artist who has recently moved into VR production and was responsible for the United Nations sponsored VR documentary *Clouds Over Sidra* (Milk, 2015), empathy is engendered by the viewer occupying an optically—and, by his logic, emotionally—equivalent position to the subject. For example, *Clouds Over Sidra* depicts some short fragments of daily life for Sidra, a 12-year-old Syrian refugee in a camp in Jordan. The project has been used by UNICEF to raise awareness for “crisis situations” and was reportedly shown at a “high level donor meeting prior to the Third International Humanitarian Appeal for Syria in Kuwait in March 2015, which eventually raised 3.8 billion US dollars” (United Nations Virtual Reality [UNVR], 2015). According to Milk:

When you’re sitting there in [Sidra’s] room watching her, you’re not watching her through a television screen, you’re not watching through a window. When you look down... You’re sitting on the same ground she’s sitting on. And because of that you feel her humanity in a deeper way. You empathise with her in a deeper way. I think we can change minds with this machine. (Milk, 2015)

Notwithstanding the inherent difficulty in correlating the funds raised for the Syrian appeal with the exhibition of the film to “high level donors”, Milk’s statement explicitly invokes substantial claims to notions of identification and subjectivity, as well as broader expectations of what constitutes empathy. Significantly, these are also issues to which cinema and media scholarship has attended over several decades, and which the VR industry is apparently wilfully or unconsciously ignoring in the push to empathy. These issues are dealt with at length in later chapters of this book but, by way of introduction, a frame from *Clouds Over Sidra* problematises one simple aspect (Fig. 1.2).

For all the rhetoric of identification in Milk’s empathy machine claim and the example he cites (quoted above), the camera in this film is almost exclusively placed at an adult height (see Fig. 1.2) rather than at the eye-level of the subjects. When you look down, you are mostly looking down



Fig. 1.2 Full 360-degree frame from *Clouds Over Sidra* (Milk, 2015). The stretched image is a 2D flat representation of the full 360-degree field of view that would appear normal to a viewer in a VR headset

at Sidra and her friends. Certainly, there are technical assumptions in the VR industry around camera placement and height which have been debunked elsewhere (Bender, 2018). Yet generalised statements such as Milk’s seemingly ignored decades of screen media and cultural analysis concerning the subjective power relations of looks and gazes (see, e.g. Comolli & Narboni, 1971; hooks, 2013; Silverman, 1996).

Against this background, there has been some criticism towards the claims of VR as an empathy machine. For instance, E. Ainsley Sutherland (2015) suggests that the “characterization” of VR and empathy promoted by the industry “is informal and assumes that feelings of presence and a first-person perspective alone will drive empathic feeling” (p. 2). Alyssa K. Loh (2017) argues that many of the negatively themed VR experiences—such as those that drop the viewer into a scene of domestic violence or the location of a terrorist bomb attack—function not to put you in the position of the actual *victim* but in the position of the general category of an anonymous *bystander* or *observer* of the event, thus “deindividuating trauma”. Recent cross-disciplinary research in media and psychology has argued that “there is an overwhelming predominance of suffering as a theme in [many] virtual depictions, comingled with uncritically asserted promises of empathy, which are problematic as the technology assumes greater mainstream uptake” (Broderick et al., 2018).

Some commentators have also expressed concerns that the technology will become too seductive. Consider for example, Wheeler Dixon's (2016) essay on VR from a cinema studies perspective. Dixon opens by reminding readers of science-fiction dystopia *Escapement* (Maine, 1956) in which the characters—known as dreamers—spend months at a time unconscious and immersed in isolation chambers in entertainment arcades known as Dream Palaces which are eerily similar to popular conceptions of the overwhelming and immersive entertainment promised by VR. Dixon then traces the current wave of VR with the crowd-funded invention of the Oculus Rift headset in 2016 and a range of tech blog writers' enthusiasm for the technology. Throughout Dixon's article, which is clearly presented as a kind of prescient—though, by 2016, belated—warning, the assumption of total immersion looms above all accounts of the technology:

I view a world in which a significant portion of the population are living in an alternative universe rather than contributing to the real one with some alarm. It may be that life in [the] 21st century, with its endless procession of terrorism, wars, famine, and ecological collapse is too much for the human mind to handle, and escape is the only option. The damage that we have done to the planet since 1950 is more than all the previous centuries of human existence combined, and in such an uncertain world, the urge to “check out” is certainly understandable. (p. 508)

Dixon's choice to ground the sceptical view of VR and its potentially deleterious social affect/effect in a piece of dystopian fiction is understandable. There are a number of fictional warnings of immersive screen technology eroding human connection in society, from Aldous Huxley's concept of “the feelies” in *Brave New World* (1932/1977) through to Spielberg's romantic *Ready Player One*. Indeed, the science-fiction technophobia series *Black Mirror* (Netflix, 2014–2019) has a number of episodes that depict horrifying applications of VR technology. For example, in one episode, *Men Against Fire*, military forces implant an augmenting technology in a soldier's brain that alters his visual impression of the human enemy into terrifying alien creatures targeted for extermination. In another episode, *Playtest*, a character is subjected to an experimental virtual horror environment which creates an experience so traumatising that he is left comatose and near death; this is further shown to be only one of many beta-testing guinea pigs expediently discarded by the game developer/corporation.

EVANGELISTS AND SCEPTICS

Even from these brief reference points it is apparent that there are predominantly two complementary but competing views about VR. The first, which is a position clearly occupied by Chris Milk, is a kind of article of faith that VR is—and will increasingly continue to become—an ultimately positive form of communication. For such evangelists, the technology is a “game-changer” (Adams, 2016; Fenech, 2018; Zeitchick, 2018), provoking empathy (Witton, 2017) and “blurring the line between the storyteller and audience” (Adobe, 2018). The second position—identifiable in essays such as Dixon’s as well as many fictional accounts of a VR-based society—is a scepticism grounded in the phenomenon Alvin Toffler once described as “future shock” (Toffler, 1971). Toffler’s account of the negative effects on individuals and society when people are “overwhelmed by change” (p. 1) echoes strongly throughout many of the sceptical commentaries on VR, augmented reality (AR) and mixed reality (MR) technologies. These technologies are of course related, although it should be noted that they are somewhat different in how much the virtual world is mixed or integrated into the real world of the user. They can sometimes be subsumed under the heading Extended Realities (XR).

It is tempting to read many of the current developments in this technological space according to Paul Virilio’s “political economy of speed” (Hanke, 2010, p. 206). Consider the rhetorical awe with which tech journalists report the sheer amount of investment in a variety of XR start-up companies:

Some of the most significant investment rounds that comprised [more than \$3 billion invested] in 2016: Magic Leap, raising \$793.5 million, Unity at \$181 million, Mindmaze at \$100 million, NextVR at \$80 million, 360fly at \$40 million, and Baobab Studios at \$25 million.

The investment in VR by what Digi-Capital calls every “big boy” on the block (Alibaba, Warner Bros, Google, Morgan Stanley, 21st Century Fox, Comcast and Samsung) right down to Silicon Valley heavyweights, dedicated VR investment firms and angel investors, is anchored around on the expectation that this market is on its way to mass-market appeal. (Kite-Powell, 2018)

Dan Golding (2019) identifies that the contemporary discourse around VR focuses much more on the “image” of a person using a VR device than the “experience” of encountering VR (p. 340). For Golding, the lack of

availability of devices has led to more commentators, along with consumers, “fetishizing” the apparatus and speculating on what the experience *might* be like rather than what it actually *is* like. We feel Golding is correct in this assessment of the industry, and many of the case studies in this book point towards the problems with existing approaches to VR analysis, criticism and/or appreciation. Yet, *Virtual Realities* proposes a new methodology—one that acknowledges the limitations of current academic and popular discourse on VR but which also demonstrates how it is possible to engage with the experiences of VR right now, as well as look towards those of the future.

Therefore, moving beyond Virilio’s concerns, it is important to “stand back from [new technologies] at a critical distance rather than unthinkingly revel in them” (Newman, 2005, p. 3) but, for VR, it will prove important to also step forward and put on the headset, watch the videos, play some game experiences, perhaps view some VR porn, and start to measure the practice of actual users. From such an encounter it will be possible to understand the arguments presented for and against VR but, much more importantly, to be able to identify and negotiate the chasm of knowledge in current understandings of the technology.

STRUCTURE AND SCOPE

One of the aims for *Virtual Realities* is to unpack some of the tension between evangelical VR hype on the one hand and sceptical views on the other. Of course, there are nuances to each position; however, both views clearly operate on the assumption that there is a teleological inevitability of mass uptake by consumers. Both positions also assume that the present technology is already immersive to the extent that users feel that they are really in the virtual world. In the technical fields related to VR studies, this is known as ‘presence’, and much psychological work has been undertaken to determine the parameters of what presence is, what technological requirements enhance or limit the experience, and how one might determine the extent to which a viewer is experiencing presence (see, for example, Lombard & Ditton, 2006; Peperkorn et al., 2015; Witmer & Singer, 1998). Yet, there is a striking absence of critical and practical commentary from the fields of academic screen studies.

Hence, this book does not aim to provide a comprehensive overview of VR. Rather, it points towards methodological issues—and some potential avenues forward—in research that is drawn from the field of screen

studies. Our aim is to provide some ideas, and indeed provocations, that move beyond the gee-whizz paradigm that claims the sky is the limit. At the same time, we aim to present methodologies and questions that avoid the problems inherent in the ‘sky is falling’ paradigm of VR scepticism. Rather than, say, making a broad claim about the empathy-inducing properties of a VR documentary, we provide examples of how a scholar might articulate their phenomenological encounter with a traumatic story presented in a VR experience. As indicated below, we will advance a particular approach to the analysis of VR that is labelled VR phenomenology.

In many ways these are inevitable and practical limitations to the academic study of VR. For instance, unlike conventional film and television criticism, some readers of scholarly works on VR will have access to a headset, yet many readers will not. Thus, how does a researcher provide an authentic account of the immersive experience for the reader who cannot experience the same material? We explore both live action 360-degree video content as well as interactive VR experiences created using game engines and 3D models. There is of course ongoing debate in academic and industry circles about whether or not the former, 360-degree video, should even be classified as VR. In screen studies, this debate seems to have been settled by advocates choosing to designate 360-degree video as so-called cinematic virtual reality (CVR) (Mateer, 2017). However, we contend that this nomenclature is really a red herring; 360-degree video productions are remarkably *unlike* cinema. For instance, by and large, 360-degree videos have no potential to be a shared experience. It is difficult or impossible to utilise conventional cinematic techniques of dramatic intensification such as close-ups and, as Bender (2018) illustrates, enormous opportunities to elicit emotion and character engagement are lost simply by the inability to generate shot/reverse-shot editing sequences. On such a basis, it is unclear what makes CVR cinematic. While it is understandable that such scholars are simply trying to find a way to legitimise 360-degree video as an object of study—and validate the particular mode of creativity—it facilitates a series of misconceived, misunderstood and misaligned approaches to comprehend the technology and works created in the medium. Against this background, *Virtual Realities* will comeingle discussion of VR and so-called CVR as well as other immersive experiences where relevant. This approach is intended to provide sufficient context to establish the relevant provocations that will unfold over the five chapters. In doing so, we aim to provide pathways for scholars to explore the

medium, whether they are based in screen studies or drawing upon the field in some multi-disciplinary endeavour.

THE PHENOMENOLOGY OF PRESENCE IN VR

This book proposes that screen studies' approaches to VR would benefit from both a simultaneous encounter with the definition of 'presence' from the field of human-computer interaction studies and a motivation to re-engage with the type of film phenomenology developed by Vivian Sobchack (1992, 2004, 2009). First, on the topic of presence, the International Society for Presence Research (ISPR) has a detailed explication of how this sensation can be defined. Although the statement runs several paragraphs and is worth reading in detail, for our purposes the first paragraph provides a clear indication of both the value and limitation of using this approach to articulate presence:

Presence (a shortened version of the term "telepresence") is a psychological state or subjective perception in which even though part or all of an individual's current experience is generated by and/or filtered through human-made technology, part or all of the individual's perception fails to accurately acknowledge the role of the technology in the experience. Except in the most extreme cases, the individual can indicate correctly that s/he is using the technology, but at *some level* and to *some degree*, her/his perceptions overlook that knowledge and objects, events, entities, and environments are perceived as if the technology was not involved in the experience. (ISPR, 2000)

Two of the obvious benefits of such a statement are that it is clearly defined and that it manages to accommodate close to all, if not all, possible experiences in VR. However, one of the limitations of the statement is that, while it provides an excellent overview in abstract and theoretical terms, by being so all-encompassing it does not quite capture the specific *sensations* of presence that might occur in different and specific scenarios, nor for specific users. For example, in watching many 360-degree videos in VR—and showing them to other people in a variety of situations—the authors of this book, Author 1: Bender and Author 2: Broderick, have experienced something that is difficult to describe in detail. Consider Fig. 1.3 from the 360-degree film *Gone in 360 Seconds*.



Fig. 1.3 View of the female detective from *Gone in 360 Seconds*. The image is cropped to represent the viewer’s field of view when looking at her in the 360-degree video (Bender & D’Silva, 2016)

When the female character looks directly at the viewer, there is momentarily a sensation that can best be described as feeling as if she is *right there in front of you*, yet, just as instantly, this sensation passes. Anecdotally, often a viewer might say after watching the video that “she was right there!” but such a statement does not mean that the viewer *believes* she was there in the room with them, nor that the viewer felt like she was there in the room for the entire duration of the video. Such responses are an example of “fail[ing] to accurately acknowledge the role of the technology in the experience” as the ISPR statement would suggest, yet that phrase does not really account for how it *feels* to have the experience. Similar experiences have occurred to both authors—and have anecdotally been reported by colleagues and associates—while watching either 360-degree pornography or while playing a VR shooter game. However, there currently does not seem to be appropriate analytic language to describe the sensation. In addition, these statements fall flat when the image is represented as above—for example, on paper or on a fixed-screen display—and

have been countered instantly by a number of colleagues at presentations who have said “But that looks like a scene from *Lady in the Lake*” (Dir. Robert Montgomery, 1947) (Fig. 1.4). To counter this, it is not enough to simply say “But it feels different in the headset, you temporarily forget that she’s not really there”. This example is discussed in detail in Chap. 2.

Again, we emphasise that the ISPR’s statement—especially when read in full—probably encompasses, if not everything, then a substantial amount of what presence *is* and how it might be experienced in VR. However, we also suspect some specific developments upon the statement can be made by referring to early theorising of VR and corporeality from a phenomenological perspective. Murray and Sixsmith (1999) comment that “people bring their everyday, real-world understandings and social experiences to new virtual encounters” (p. 320). They provide an example from a contemporaneous study (Murray et al., 2000) where participants could move through a virtual cityscape. Participants typically moved their mobile view *around* building corners and stayed on roads and



Fig. 1.4 An example of first-person point of view in *Lady in the Lake* (Dir. Robert Montgomery, 1947)