

# The Self: Unique Advantages and Disadvantages of Virtual Reality

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## **The Self: Unique Advantages and Disadvantages of Virtual Reality**

Throughout human history, people have devised ways to share thoughts and experiences with each other. In Frank Rose's (2012) summary of the views of Georgia Tech's Janet Murray, "every new medium that's been invented, from print to film to television to cyberspace, has increased the transporting power of narrative" (p. 28). Audiences must adapt to the novel features of new media to fully realize that power. In 2016, high-end virtual reality (VR) headsets designed for home use were introduced (Durbin, Feltham, & Baker, 2016). Over the following four years, software developers and early adopters have been invigorated by the opportunity to work with expensive and computationally demanding hardware, creating and sharing small experiences showcasing immersive VR. Such experiences can "deliver the strongest possible emotions in the shortest possible time" ("Richie's Plank Experience").

VR purportedly offers *immersion*: a vague descriptor to justify the medium's existence to an often unconvinced audience—as if this feeling of being truly present in an experience were unique to this medium. However, video games, films, and even books can be immersive. To "get lost in a book" or to be "one with your character" in a game are immersive experiences. As VR development extends past arcade experiences into longer-form narratives and simulations, hardware designers, developers, and VR enthusiasts will confront VR's distinctive properties. To some, VR offers a method to showcase the world and its multitude of unique experiences, transcending barriers to understanding individual identity and groups similar to oneself. Others, however, warn that VR is an highly inaccessible medium, leaving wealthy privileged groups with uninformed senses of human understanding.

## Review of Research

Media scholars have examined the relationship between technology and human expression. In *Hamlet on the Holodeck*, Murray (1997) investigates film, television, and the internet as of the 1990s. While her then-contemporary look at technology excludes VR, she diagnoses immersion in film, text, and games as a state so fragile that “all narrative art forms have developed conventions to sustain it” (p. 100). In social online role-playing games where one plays a character in a larger shared universe purely through text and game mechanics, she finds that for immersion, a player must have goals to ensure enough investment in the world. Players also need means of redressing conflict with each other, which protects immersion during temporary pauses in the game (p. 112).

Some scholars reduce immersion in video games and VR to spatial presence. Psychologist Jamie Madigan explains spatial presence as “players forming a mental model of the game’s make-believe space” and slipping “their point of reference for where they ‘are’” into the game (2010). The mental model must be sufficiently populated, must hold up to scrutiny, and be consistent with itself to maintain immersion. Head tracking in VR lets the user use their real world spatial awareness and visual investigation skills in the virtual world to “buil[d] a better mental frame-of-reference for the space” (Pausch, Proffitt, & Williams, 1997). However, spatial presence is not the only component of immersion in interactive media. Flow is a state achieved under intense understanding and concentration (Csikszentmihalyi, 1996). For a player in flow, goals and inputs are intuitively translated to actions in the world of the activity, without first passing through a meta-cognition level where such actions are conceived. Michailidis, Balaguer-Ballester, & He insist that the flow state is closer to immersion: in flow, multiple brain processes

work in unison to merge action and awareness, rather than producing an out-of-body experience as spatial presence does from a neural perspective (2018).

Immersion is still created in non-interactive media, but cannot be created directly. Stephen King says that “description begins in the writer’s imagination, but should finish in the reader’s” (2000, p. 174). Effective emotional resonance requires the audience to place their feelings inside another entity. Such emotional immersion is more effective than spatial presence in creating a lasting and memorable experience (Zhang, Perkis, & Arndt, 2017). Creating emotional immersion can be harder than just succeeding on technical levels. An emotionally resonant story requires authentic appeals to basal human emotions like fear or joy while also relaying a self-consistent narrative (Stogner, 2011). A certain level of emotional distance between an audience and a subject must be carefully kept balanced so this media can act as “a space to practice intense emotions and states without exposing us to the complexities or harms of those states in reality” (Olson, 2020). A sense of immersion should be indulged without completely consuming a viewer. This balance is a unique attribute and challenge of high-end VR, often engaging the visual, audio, and kinetic senses completely to achieve an intentional and highly specific illusion and effect.

### **Agency and Space-Time Travel**

Immersion in VR, through its various progenitors, engages a user with a work as it unfolds before them with new levels of agency. While compelling, immersion introduces temporal turbulence due to the difference of presented viewpoints. A viewer sees action and detail presented in a present timeframe, but VR filmmaker Mike Woods points out with his own emphasis that “Storytelling is a RETROSPECTIVE thing” (2016). This slant to the past

editorializes the content, so that every detail serves a narrative or atmospheric purpose. The retrospective perspective creates focus by pruning away the extraneous.

However, VR places a user in a living world with a present reference frame. A user can look anywhere in a scene and be presented with some information, pertinent or not. Viewers of early VR films complained that this 360-degree immersion in a recorded story placed “additional burdens of director and cinematographer” on their shoulders, “often offering little in the way of effective framing or valuable visual clues” to convey the important content (Machkovech, 2016). Developers have matured the language of VR film-like experiences to account for a user’s agency in deciding what to view. Uniquely, the documentary genre can leverage agency as gentle narrations provide context to a user’s own explorations through the encompassing visual information (Woods, 2016).

Recreating the natural world in VR democratizes unique world experiences for those without the resources to travel and allows unprecedented amounts of agency in those explorations. For example, National Geographic showcases the Okavango Delta elephants, allowing users to meet them at eye-level and inches away, something rare for even controlled zoo-like environments (Bale, 2019). This virtual globe-trotting can happen independently without compromising safety, important for populations requiring travel accommodations like the elderly. In these cases, Rendeever, a tech company partnering with hospice facilities, uses Google Maps data and mobile phone-based VR to foster exploration in aging populations, letting them “go wherever [they] want without going anywhere” (Miller, 2016).

Two seniors participating in a group VR session at their nursing home elicited very strong reactions to their Rendeever experiences. The first, Marian Kieth, fell speechless aside from an audible gasp upon seeing and exploring her old home, recounting specific memories

correlated to the spots she visited around the perimeter of the house. Although Marian could not describe or remember the experience when approached after the session, her strong emotional response to the memories gave her moments of clarity she would not have otherwise had. The second resident, Abtu Shakor, visited a restaurant he opened in Belgium more than 20 years ago during his career as a chef, overjoyed to see it still in place. This visit allowed him to reminisce about the highlights of his career, and plan future visits to other places he's traveled throughout his life despite being home-bound (Miller, 2016). Through experiences provided by companies like Rendever, people regain autonomy in how they navigate spaces and their own narratives. In the cases of Marion and Abtu, they explored and engaged with the narratives of their own lives, as opposed to being guided through an impersonal experience they could disconnect from easily.

While this type of VR experience is still new, it does have roots in photography therapy, which stimulates the mind by using visuals as a link to a person's existing memories, drawing out momentary engagement (Bender, 2018). Frans Hoogeveen posits that photographs provide a visual point of reference for the aging person to engage with so they can mentally associate it with something that already exists in their brain (Bender, 2018). Through this association, a person has a point of reference to re-engage with the world (Bender, 2018). VR serves the same function, but grants the user the agency to manipulate the reference frame, allowing for more active and stimulating experiences through self-guided investigation. Users, realizing this investigative ability, take control of their experiences in their travels in time and space and use their agency to immerse themselves in the medium.

### **Transformation as Understanding**

VR's strengths lie not just in virtual transportation, but uniquely in transformation. To understand this transformative ability, one must know the human sense of proprioception, or the spatial understanding the body has of itself, is very malleable. The "rubber hand illusion" demonstrates that this sense of bodily self can shift into a rubber hand by receiving synchronous stimuli to a sensing hand and an inanimate object (Botvinick & Cohen, 1998). Recently, researchers found that participants' sense of self could be moved into the bodies of non-humanoid avatars like tigers and spiders using nothing more than visual stimuli and clever control methods in VR environments using a first-person viewpoint (Krekhov, Cmentowski, & Kruger, 2019). Krekhov, Cmentowski, and Kruger also found in their participant's surveys that while most had not "seen a VR documentary about nature," they were excited to try the experience again with a new animal and "increase their empathy towards that creature" (2019).

Utilizing this proprioceptive shift property, people can use VR to try on different bodies to process the nature of identity and even accidentally uncover conflicts between their body and self identity. *Sairento VR* is a 2017 first-person action game where players play as a "deadly cyber ninja" performing parkour maneuvers and fighting robotic foes in unique and violent ways (Mixed Realms PTE LTD, 2017). This game, upon release, was one of the few VR games that featured exclusively a playable female character with no male option available until years later. Certain male VR gamers took issue with this, exemplified by these comments "being a girl in VR is a bit of a gamebreaker," finding "being able to turn off the model helps a lot" with the discomfort of being in a body that is not one's own (Dawn11715, 2018).

However, what induced a temporary and reduced feeling of gender dysphoria in the cisgender male gamer can be used by transgender VR gamers to alliviate or affirm their own sense of self. *VRChat*, an online social space akin to a chatroom, allows people to be represented

by body-tracked avatars of their own choosing, which user Zambina uses to exist as a woman with others as she cannot do so freely at home (as cited in Brown, 2019). She remarks her time in VRChat “definitely helps alleviate dysphoria” and reinforces her “desire to transition” (Brown, 2019). While *VRChat* facilitates the exploration of binary and non-binary gender expression via an embodied avatar, an inherently social space can be rife with bigotry or those who will cross lines from hateful words to hateful acts. Sexual assaults with virtual bodies have occurred in other VR games and experiences, putting those who do not perform to the often assumed standards of cisgender heterosexual men in danger as they utilize the platform (Belamire, 2016). This makes single-player simulation experiences valuable, as that world will react properly to the user’s preferred identity in a safe manner. Brown collects Mika’s experience with *Skyrim VR*, “referencing how [non player characters] will, without fail, respond with the correct pronoun for your character’s gender” (2019).

BeAnotherLab, a technical art collective based in Zurich, showcases the power of being able to inhabit another body, by adding the context of life experience back in. Their system, called the Machine to Be Another (TMBA), uses synchronized video playback and tactile cues from aides or participants to establish bodily presence in a real-world human body recorded from a first person view (BeAnotherLab). The Embodied Narratives project uses TMBA, attempting to achieve their goal of increasing human empathy for others. One such narrative is that Jonah, a transgender guide from Amsterdam, who provides narrative context to his life and struggles while users “experience their stories while you’re in their body” (Hollender, 2018). Jonah’s life experience, shared in an intimate and attention-consuming way, allows personal realizations to become emotionally immersive as well as visually and spatially immersive. While the “storyteller feels like they’ve been heard” as a result of sharing their experience, this particular



type of experience is currently limited to specific events due to the requirements of trained aides to maintain the body swapping illusion (Hollender, 2018). These inaccessible aspects of this experience are not simply limited to this installment, but extend to the entirety of VR itself.

### **Limitations of VR**

While the transformational and transportational properties of VR make its sense of immersion unique, the platform remains highly inaccessible. Video game players without VR, sometimes called “pancake gamers” for their flat two-dimensional viewpoints, must make investments of about \$1000 to enter into the cheapest high-end VR space, where costs are split between a low-end VR headset and the more expensive and more powerful computer to drive the headset (Webb, 2019). This expense has led high-end VR to be considered an expensive hobbyist technology without strong appeal to the mass-market, where critics often remark that VR does not yet have a “killer app” to encourage adoption.

*Half-Life: Alyx* (HL:A), the next installment of the influential *Half-Life* franchise, was announced November 18, 2019 to much anger of pancake gamers and released March 23, 2020 (McWhertor, 2019; Acovino, 2020). The comments under McWhertor’s article deride the first entry in the franchise in 13 years as a cynical and “suicidal business move” to lock “the most popular PC franchise” behind expensive hardware the publisher also manufactures (2019). However, costs are not the only factor keeping people locked out of VR as a whole. Shortly after HL:A’s release, noted game designer Anna Anthropy critiqued VR in “that it assumes an able-bodied player with no mobility issues” and “disability and access is almost certainly going to be left out of the [VR] conversation again” (2020). Accessibility in VR spaces are regularly discussed, but for only one type of user: those who experience motion sickness in VR. Up to 70

percent of users experience motion sickness in VR after just 15 minutes of use, which leads developers to develop techniques around this out of necessity (Kim, 2019).

Motion sickness in VR is regularly explained as the experience of “my brain tells me I’m moving, although I know I’m not,” here specifically in reference to the optional “continuous movement” control schema of HL:A (Park, 2020). While this can be mitigated by keeping the player’s avatar physically still and teleporting them to a new location, this does not remove motion sickness in every user, partially due to persistent bias in VR headset design. The illusion of seeing depth in VR is caused by showing an image to each eye from a slightly different perspective, which must be faithfully reproduced using the measurement of the interpupillary distance, or IPD. (Kim, 2019). This millimeters-long measurement that the headset is designed around is designed “the average IPD of males” of 64 mm, while the “average IPD [for females] is nearly 5 mm smaller,” ruining the illusion and causing discomfort for a majority of the population when considering the default IPD does not work for many men as well (Fulvio & Rokers, 2018).

Technical and design issues are not the only challenges to VR as a transformative experience; there is real danger in audiences assuming more power in an experience than there really is. An interactive experience, where a user feels they are able to embody the perspective of another for a short time, can lead to an overconfidence in how well the user understands the totality of that experience. Anna Anthropy’s response to this overconfidence of the cisgender audience to *dys4ia*, her semi-autobiographic collection of minigames on her experiences as a transgender woman, sums this up well: "If you've played a 10-minute game about being a transwoman, don't pat yourself on the back for feeling like you understand a marginalized experience" (D’Anastasio, 2015). Dr. Douglas Gentile does confirm that empathetic games

“increased helpful and decreased hurtful behavior” in children, but warns that this experience is “different from understanding someone else's experience” (Saleem, Anderson, & Gentile, 2012; D’Anastasio, 2015) A VR experience inspiring empathy from visualizing oneself as another is powerful and can even help reduce implicit bias, but it cannot replace the value of education and long-term effort as a pathway to allyship (Banakou, Hanumanthu, & Slater, 2016).

## **Conclusion**

While VR offers a unique and encompassing expansion of human experience through immersion, it can also be limited by the boundaries placed by developers or gaps in innovation. The unique immersive experience has allowed for unprecedented engagement and social impact through challenging perception and redefining the limits of human experience and imagination. However, while the immersive experience itself has crossed traditional boundaries of engagement and innovative thinking, it brings into question where the boundaries are. The immersive experience VR provides also lends way to issues of accessibility and ethical usage for vulnerable groups. These issues are direct consequences of developers, but are often shouldered by users. This shuts out critical populations from accessing these technologies or providing valuable feedback to improve future development.

VR has a very critical affect on human connection, communication, expression, and understanding as evidenced by the diversity in outlined experiences across often-excluded communities: the aging community, the transgender community, the disability community, and so on. These critical effects have the power to impact society on a large-scale and give greater voice to a variety of experiences, emotions, and ideas that are difficult to verbalize or express. As VR continues to expand its limitations and boundaries in experience, intentionality should

continue to be placed on audience inclusion - more specifically, who could benefit most from these immersive experiences and how can developers get these products to them. Diversity and inclusion of experiences will not only allow VR to be more limitless and immersive - it will be transformative.

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