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31 Embodiment and Representation in Social VR

Abstract: This chapter examines the relationship between physical bodies and their digital representations in virtual spaces through Olga Goriunova's (2019) concept of 'digital subjects.' Constructed through computational processes and data aggregation, digital subjects represent users in virtual environments but are not strictly identical to them. They occupy a liminal space that blurs the boundaries between the physical and digital. Focusing on Meta's *Horizon Worlds*, an immersive social VR platform, the chapter explores how data collection mechanisms are used to construct these digital subjects. By examining how biometric, behavioral, and environmental data are collected, it becomes clear that digital subjects are simultaneously connected to and separate from their users, creating a new mode of subjectivity that persists beyond the user's control. These digital subjects maintain an indexical relationship to users, pointing back to them while also operating with a degree of autonomy, even in the absence of the user's active participation.

Keywords social VR, Horizon Worlds, digital subjects, indexicality, subjectivity

Mr. Bungle—a notorious resident of LambdaMOO (one of the many text-based virtual realities available in the 1990s generally known as MUDs, or multi-user dungeons, and more specifically a subspecies of MUD known as a MOO, or MUD, Object-Oriented (Consalvo 2011; Mnookin 1996))—became infamous for multiple acts of horrific violence, mostly of a sexual nature. As described by journalist Julian Dibbell (1998), his looks were cruel and indicative of his demeanor. His attire added a layer of deviance which reflected his malicious behavior. This behavior became increasingly aggressive over time. It included coercing individuals into involuntary interactions with others and causing someone to attack themselves with a knife. Mr. Bungle violated many, with no one seemingly able to stop him. However, Mr. Bungle never physically touched anyone as he only existed in the virtual realm. The only real action, it may seem, was the exchange of electronic signals transmitted from various locations worldwide.

MOOs and MUDs depend on physical, spatial metaphors, where visitors' computer screens display a textual description of the room without graphics and users can talk to others in the room or interact with objects (Mnookin 1996). Users would provide textual descriptions to create the character they controlled (Jacobson 2001). Mr. Bungle exploited this text-based system via a 'voodoo doll,' a subprogram designed to assign actions to other characters without their consent or initiation. As Dibbell writes, most players condemned the use of this subprogram. As one player pointed out, "it's one thing to grasp the notion intellectually and quite another to feel it coursing through your veins amid the virtual steam of hot netnookie" (Dibbell 1998, 17).

What does Mr. Bungle's case illustrate, along with the language Dibbell reports, which tends towards the crass, affective, and embodied? While his actions exemplify sexual violence online, my focus isn't on the cultural anxieties surrounding online violence and sex. Instead, his case—rooted in the text-based environment of LambdaMOO—foreshadows the complex questions surrounding digital representations that persist and have only become more pronounced in contemporary virtual spaces. In LambdaMOO, text-based descriptions served as proxies for users. Today, these dynamics have become more intricate with the rise of embodied virtual spaces such as *Rec Room*, *VRChat*, and *Horizon Worlds*. While the shift from text-based descriptions to embodied avatars alter how representation operates, the underlying tension about the relationship between the physical body and digital representation remains. What I'm interested in describing here is how representations of a user in virtual worlds involves, on one hand, deeply held beliefs that these representations are 'attached' or linked to one's real body, a set of beliefs illustrated by the notorious case described above. But, what I want to suggest is how—especially with the more complex virtual worlds now relying on a massive range of data extraction technologies—the link between body and representation remains ephemeral or open.

In other words, the tension between the body and representation is further complicated in virtual spaces by the way these digital representations take a life of their own, becoming what Olga Goriunova (2019) terms "digital subjects." Far from being mere stand-ins, these digital subjects evolve into forms of subjectivity that both reflect and exceed the user. Goriunova defines digital subjects as "subjects formed in the computational ensembles out of data, models, and various other analytical operations" such as a subject of a Facebook stream, browsing history, or biometric data (1). These subjects move between captured biological characteristics and symbolic online expressions, blurring the line between the material and the digital.

Building on Goriunova's concept, this chapter argues that digital subjects occupy a liminal space that represents and can stand-in for the user without being strictly identical to them. Focusing on Meta's social virtual reality platform, *Horizon Worlds*, I argue that digital subjects maintain an indexical relationship to users while also possessing the capacity to act independently, thus creating an alternative mode of subjectivity. I examine how the platform's data collection mechanism contributes to the formation of these digital subjects.

The concept of the 'index' was introduced by philosopher Charles Sanders Peirce to refer to a particular kind of sign that has a connection with its object beyond associations made by a mind (Peirce 1992, 226). Peirce identifies two categories of indexicality. First, as Mary Ann Doane (2007) explains, an index as *trace* refers to when a sign possesses an imprint of its object, such as a footprint in the mud, implying a material connection between the sign and object. Doane contrasts this with the index as *deixis*, which is understood as the pointing finger, or words such as 'this.' Deixis refers directly to something without inherently requiring an interpretive association, but may lack a direct physical connection to its referent. It instead points to something else, serving in a similar manner to what Chris Chesher (2023) refers to as the "invocational" quality of

media. Avatars serve as deictic references, pointing back to their users while, I want to argue, simultaneously operating with some degree of autonomy.

Digital subjects in virtual spaces challenge traditional notions of indexicality. Unlike physical traces, the connection between digital subjects and their real-world users is often ambiguous due to the absence of a material link. Instead, there is a deictic reference that points back to the user, even in the absence of a direct physical connection. While digital subjects pose as representations of the users, they aren't identical to them and can act beyond the user's control. In other words, the connection between the user and their digital representation isn't inherent; an avatar can engage in actions independently of, or even contrary to, the user's intentions. While avatars refer to real people, creating a form of indexicality, this reference can be detached from the actual person behind the avatar. For example, abandoned accounts still point to their users although they are no longer active, and avatars can lurk in the virtual spaces even when the user has logged out.

To develop this claim, I examine *Horizon Worlds*, focusing on how the platform collects the user's biometric data, location information, as well as in-world behaviors, preferences, and interests. These data points aggregate to form a digital subject that represents the user in the virtual realm while also having the capacity to operate autonomously, extending beyond their direct control.

Introducing *Horizon Worlds*

Social VR spaces have gained significant attention due to their role in shaping the vision of the metaverse. Although the hype surrounding the development of the metaverse is waning, it should be noted that the metaverse could be considered one of the most expensive projects in the history of technology to date (Mann 2022). In 2021, Facebook rebranded itself as Meta as part of its metaverse ambitions and planned to allocate at least \$10 billion to Meta Reality Labs, the metaverse division responsible for the development of virtual reality hardware, software, and content (Kastrenakes and Health 2021).

Horizon Worlds is a Meta-owned social platform that offers a virtual space designed for social interactions (Meta Horizon). It marks Meta's first step toward achieving its ambitions for the Metaverse. Within this platform, users can explore a myriad of user-created worlds, ranging from social shooting games and nightclubs to museums and public parks, ensuring a diverse array of experiences for everyone. These spaces are shaped by their users, who are represented as avatars that mediate engagement with the environment, objects, and other people, fostering a shared understanding of the virtual world (Girvan 2018, 1099). According to Hillis (1999), VR comprises individual experiences that can "substitute, represent, or simulate the concrete and fantasy places within which the embodied subject participates in the lived world" (xxxiii). Within these virtual spaces, users can partake in activities that closely resemble

real-life experiences, such as hosting parties or wandering in public spaces through the customization of avatars (Freeman et al. 2022).

Data Collection in *Horizon Worlds*

The rise of social VR platforms has introduced a new dimension of deeply immersive and embodied social interaction that transcends physical constraints. Immersion represents the culmination of more than two centuries of screen-based practices designed to enhance sensory engagement (Ross, 2020). In VR, immersion—enabled by head-mounted displays—creates the sensation of being completely absorbed ‘in’ a virtual environment (Bartle 2003), isolating users from external visual stimuli (Grau 2003). As Bollmer and Suddarth (2022) note, immersion “foregrounds a necessary, if contingent, articulation between body and medium,” highlighting that bodily movement and interaction must move and align in ways that parallel its actions in the physical realm (3). This underscores how immersion is inherently tied to the body, necessitating users to engage and coordinate their movements within virtual spaces (Hillis 1999).

The immersive nature of social VR isn’t merely a perceptual experience; it is a crucial mechanism for generating data upon which digital subjects are constructed. Corporations such as Meta collect, store, and analyze such data (D’Ignazio and Klein 2020, 42) which helps ensure that the virtual experience is functioning properly since the content within the virtual space responds accordingly (Bailenson 2018b). As Egliston and Carter (2021) argue, immersion in VR relies on data about the body, its spatial and temporal location, and the user’s physical environment to enable interaction within the virtual space. Such data is captured through various technologies embedded into the VR system. For example, the Oculus Quest system, Meta’s hardware that powers *Horizon Worlds*, functions as a self-contained mobile headset that transforms each VR system into an autonomous computer under Meta’s full control, making Quest “a data intensive digital sensor” (Carter and Egliston 2024, 7). The system integrates hardware components into the headset and controllers, using built-in sensors, outward-facing cameras, and algorithms to capture and interpret body movements within virtual environments (Egliston and Carter 2022, 595–596). The sensors “enable the device to algorithmically construct a map of the environment around itself, such that the software can track the position and movement of the device through space” (Egliston and Carter 2021, 7). In addition to tracking movements and device motions, the system collects extensive data on the user’s body and their physical surroundings (Egliston and Carter 2021; 2022b; 2022a). For example, when the user sets up the Meta Quest Guardian System to alert them when approaching a boundary, Meta collects data on the defined play area. Additionally, when the hand tracking feature is enabled, Meta gathers technical details such as the user’s estimated hand size and movement data to enable this feature (Meta 2023).

Meta also outlines in its Oculus Privacy Policy (2023) that it processes voice interactions to respond to user requests, deliver the requested services, and refine its voice

services. In the Supplemental Oculus Data Policy, Meta further details the data it collects, which includes users' physical attributes and dimensions when they activate features such as hand and body tracking, eye tracking, and natural facial expressions. Additionally, Bailenson (2018b) points out that VR systems now collect nonverbal behavior. These systems typically track body movements 90 times per second to accurately display the scene, with some systems recording 18 different types of movements across the head and hands. As a result, spending only 20 minutes in the virtual space can produce almost 2 million unique body language recordings (1). This suggests that, after only five minutes of data, users can be identified with a high degree of accuracy based on their head and hand movement relative to virtual objects (Nair et al. 2023).

Therefore, by participating in social VR spaces, users often relinquish control over their data, which becomes detached from their physical selves and is instead controlled and owned by the platform. Consider *Horizon Club*, a popular nightlife spot within *Horizon Worlds*, where users meet to dance, mingle, and share virtual alcoholic beverages, often communicating via voice chat. Meta explicitly states that they analyze and review these voice interactions to improve and train their speech recognition systems. They also use and retain data from hand and body tracking to improve and troubleshoot the tracking feature. Furthermore, Meta notes that *Horizon* profile information, including pictures and avatars, are public. As a result, users' avatars may appear in pictures, recordings or live streams taken and shared by other users. This suggests that avatars, pictures, and videos of interactions within the club can persist and be interacted with even after users have left or are no longer active within the virtual environment (Meta n.d.). This is to say that the user's data collected throughout the presence at the club can be engaged with even after the user has logged off.

In other virtual environments, such as the team-based shooting game *Arena Clash*, players engage in tactical combat, utilizing a range of weapons while navigating dynamic environments that feature vertical climbing challenges. During online play, Meta emphasizes that a player's activity—ranging from shooting and reloading to positioning themselves strategically within the game's complex landscape—along with their personal information, are visible to all other players. Meta further points out that this data can be collected within the game, recorded, live-streamed, and shared by other users, both within the Meta VR ecosystem and beyond. In these games, Meta also collects data on players' physical characteristics and movements, including the position of their headset, the speed of the user's controller movements, and any shifts in orientation, such as when a player crouches or changes posture during gameplay (Meta n.d.).

Constructing the Digital Subject

The extensive and detailed process of data collection serves as the basis for constructing the “digital subject as an aggregate of the data captured by the actions that a user takes” (Wark 2019, 69), ultimately serving as a representation of the user within spaces

like *Horizon Club* or *Arena Clash*. As Goriunova (2019) explains, digital subjects are constructed identities formed through the compilation of data, profiles, and other recorded and aggregated information. They are emerging forms of subjectivity created through computational processes and utilized by power structures to identify and control human identities. While digital subjects are representations of the users constructed from various forms of data, they “do not have absolute representational correspondence to humans and their collectives” (Goriunova 2019, 135). They are not the same as the human but are constructed from the data that the person generates. In other words, digital subjects aren’t data doubles; they operate deictically, pointing to the user as their referent. They exist as distinct entities derived from the data generated by users themselves. As Goriunova (2019) points out, they are correlations, rules, identities, and engagements that are connected with one another and categorized and speculated upon to represent the user at a certain point in time. In simpler terms, data generated in virtual spaces is worked upon and produced as digital subjects that don’t necessarily coincide with the self. They are ‘illusory subjects,’ as Goriunova suggests, serving various purposes, including advertising and content personalization.

Such digital subjects exist as distinct entities, formed from accumulations of user data that can operate autonomously, even after the user logs out. For example, the digital subject created from a player’s weapon usage stats, win streaks, losses, and rankings in *Arena Clash* can be engaged with by others even when the player is not actively logged in. This digital subject is simultaneously connected and disconnected from the player; it represents the player but isn’t really them. As Goriunova (2019) writes, these digital subjects are not the ‘I’ that reflects the user, but they are not anyone else other than that user. This suggests that while digital subjects have a deictic relation to the users, they are also separate entities and can persist beyond the user’s immediate presence and control. They can be mobilized in ways beyond one’s awareness. When the connection between the body and online data is severed, such as when the user is temporarily away or no longer actively participating in virtual spaces, the digital subject can operate independently and circulate without the user’s involvement. As Bollmer notes, our online data becomes not only independent of the user but also owned and controlled by the network (Bollmer 2013, 145). Our data has a life of its own once gathered by the network.

Conclusion

In *Horizon Worlds*, the immersive experience of social VR becomes a mechanism for generating the data that shapes the construction of digital subjects. These digital subjects, while deictically pointing back to the user, occupy a liminal space, simultaneously standing as a representation of the user while also existing apart from them. It is this liminality of digital subjects—where they are simultaneously you and not you—that imbues them with an uncanny nature.

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