Let's Play the Metaverse …!

Expanded Realities as Transparent Playheads

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LET'S PLAY …!

Let's Play the Metaverse as "Show Gamers"!

Actors and video gamers share a passion for playing, even if they are categorically different from one another. Actors embody predetermined performance structures that they take from screenplays, scripts, or other textbooks. Video gamers, on the other hand, are more like sportsmen or improvisational actors who want to achieve their best indeterminate performance within a defined setting. They control proxy entities as their determinants and try to influence the conditions of the virtual environment in their favor.

The surroundings of the stage and the virtual world differ from each other. The chaos of the world ends in front of the theater stage, where everything happening on it is predetermined (except in improvisational theater). In video games, the chaos also ends outside the respective devices, but their players try to perform in a determined environment through indeterminate behavior. They want the game to develop to their advantage, whereby the behavior can vary greatly depending on the type of game.

The instrument of a video gamer is the remote control of an external virtual entity with an input device; the instrument of an actor is the control of his/her own body. The voice of the video gamer does not influence the virtual world directly (for now), whereas the voice of the actor is often an expression of the highest relevance to the audience. Video gamers can send their avatars into situations that would otherwise not be possible for humans. They jump over canyons, fly, run through fire, slide down icy slopes, and climb vertiginous mountains or buildings.

However, the decisive difference between the two is self-perception. The actors are aware of their ability to send signals through their posture, movement, language, and rhythm; in the case of video gamers, this self-perception disappears behind the actions of the virtual entity. While video gamers are playing, their attention flows into the extended sensory zone of the game.[1] But what happens if the characteristics of actors and video gamers are combined? In German, the expression "Schau-spieler" (actor) can be translated in a wider sense to "show-gamer." In other words, it refers to someone who is playing in a certain way in order to show something. The determined play of the actor merges with the indeterminate remote-control game of a video gamer to a "show-gamer," and therefore, must behave within an interactive, virtual environment. The experience of the respective subject becomes a performance.

This determines the topic of this article, which is the kind of experience the interaction of extended realities (XR)[2] and the mental imaginative power of theater can generate.[3] To record such experiences, an evaluation method based on *microphenomenology* was developed to scientifically document these processes. Therefore, the research question to be discussed is: "How can the imagination of the individual be brought into codynamic coherence with the possibilities of the Metaverse?"

The participants can be described as *playheads* during their interactive experiences using head-mounted displays (HMDs) based in virtual environments as they perceive the respective world and act within it.[4] The term *playhead* is understood literally here, i.e., the thoughts of the acting subject provide information about the personal experience. This allows the subjective experience of being a

1 This extended self is illustrated in the example of the phenomenologist Merleau-Ponty with the blind man's cane, which becomes an extended sensory zone as an insentient body unit. Cf. Merleau-Ponty, Maurice/Böhm, Rudolf: *Phänomenologie der Wahrnehmung*, Berlin: de Gruyter 2010, here p. 173.

2 XR is a collective term that subsumes virtual reality (VR), mixed reality (MR), and augmented reality (AR).

3 Brenda Laurel assumes that such applications do not have to be connected to the real world but must have artistic accessibility. Cf. Laurel, Brenda: *Computers as Theatre*, Upper Saddle River, NJ: Addison-Wesley 2014, here p. 146.

4 In various software applications, the term *playhead* refers to the position within a timeline that indicates the localization of the time position. The playhead is a signal pickup at which the signal is decoded. For example, the time position on a YouTube video or the needle on a record player.

"show gamer" to be made visible, making feelings and associations intersubjectively comprehensible. The aim of this process is to identify parameters that can be used to bring the individual's imagination and the virtual representations of the Metaverse into greater coherence. This text presents the method of *microphenomenology* evaluating the HMD-based XR experiment *Ndinguwe* at the storyLab kiU of the Dortmund University of Applied Sciences.[5] This is a relevant addition to the existing evaluation methods of VR research, as explained below.[6]

Let's Play via *Microphenomenology*!

Microphenomenology comes from the Würzburg School of Psychology and aims to create scientific foundations through the dialogical recording of language. At the center of this method is the subjective "experience" of the participant, which finds expression in language during the experience. This is described in the text by Gerhard Benetka and Thomas Slunecko: "'Erleben,' das zur Sprache kommt" ("'experience,' that is verbalized"):

> "We treat the approach of the Würzburg School and microphenomenology as rule-guided language game in which 'inner' mental processes, i.e., those given in the perspective of the first person, are to be expressed in a dialogue. A dialogue in which this entry into the field of meanings takes place in what we believe to be a specific and precisely describable way. One can, therefore, say that inner experience is articulated in a language common to the subject and the experimenter; it is 'objectified,' intersubjectively accessible, and thus 'knowable.'"[7]

We also find this objectification of perception in the work of Don Ihde, a philosopher of technology, who distinguishes between *micro-* and *macroperception* in

5 The VR experiment was realized as part of the artistic research by the research team Harald Opel (artistic director of the storyLab kiU), Tobias Bieseke (project management), Jan Schulten (programming), and Azziza El-Yabadri (art direction) during a six-month development process.

6 Cf. Slater, Mel et al.: "A Separate Reality: An Update on Place Illusion and Plausibility in Virtual Reality," *Frontiers in Virtual Reality* 3, (2022), pp. 10-13, here p. 10. https://doi.org/10.3389/frvir.2022.914392

7 Benetka, Gerhard/Thomas Slunecko: "'Erleben,' das zur Sprache kommt," *Journal for Psychology* 29, no 2 (2021), pp. 17-40, here p. 33, https://doi.org/DOI:10.30820/0942-2285-2021-2-17, my translation.

his theory of *postphenomenology*.[8] *Microperception* refers to the sensory perceptions of the subjects, which are expressed by the participants. In the process of *macroperception,* these statements are then objectified in the process of culturally and hermeneutically mediated perception. These are, however, permanently characterized by interpretation and design achievements. These methods make it possible to analyze subjective effects and contextualize them. As these methods take place within the framework of artistic research, the statements themselves become the subject of the process. This means that not only the artifact but also its resonance space is the subject of the artistic product.

The VR experiment *Ndinguwe* was evaluated using a method based on *microphenomenology,* and 71 relevant observations were collected. The experiment was conducted with children, actors, directors, professors, athletes, teachers, designers, sociologists, students, VR experts, and museum curators. However, this text focuses exclusively on participants from the theater environment. Each evaluation was recorded in image and sound both from the inside perspective of the headset and from the outside perspective using an external camera (see Figure 2). The videos were synchronized using editing software, and the respective images were arranged next to each other. Statements were transcribed, and concise actions were recorded in brackets (e.g., gets scared, looks at hands, etc.). During the experiment, the experimenter interviewed the participants as they experienced the various scenarios. The participants were interviewed using a questionnaire,[9] which provided a flexible system for recording individual descriptions. The survey was conducted in German and later translated into English. In essence, it was about the experience of self-perception, haptics, narration, and mixed reality (MR) elements. This method was modified during the process in order to optimize the individual quality of the statements.

The Metaverse will make people more transparent in their perception and experience. This characteristic means responsible handling of the knowledge gained and the data collected. For this reason, a protected space with a trusting person is relevant so that participants can engage in the evaluation with confidence. Trust is an essential point because the stronger the trust, the more detailed the participants

8 Ihde, Don: *Technology and the Lifeworld: From Garden to Earth*, The Indiana Series in the Philosophy of Technology, Bloomington, IN: Indiana University Press 1990, here p. 29.

9 Cf. interview form: "Evaluation_NDINGUWE_Platz.docx—Google Docs," accessed November 9, 2023, https://docs.google.com/document/d/1wbtUqWTcDovAgxc_6r9dmPF5id9Qg07/edit?usp=share_link&ouid=105174621274629706621&rtpof=true&sd=true

are willing to explain sensitive topics. Interviews conducted among persons who are familiar often yield higher levels of detail. This can help to learn more about the subjective perception of the participants.

The Metaverse

In this case, the Metaverse is a place that consists of many unconnected locations and exists in a virtual imaginary world. This place cannot be physically but only virtually reached by visitors. It has no topographical connection but follows its own determinations. The Metaverse is a lucid, optical deception that is partially connected to the physical environment and accordingly enables different interactions. It is a constructed virtual world in which countless individuals can participate and accordingly experience a shared world of expertise. In this place, people can come together who would never meet in the physical world. They are not dependent on their natural constitution but can experience embodiments that have arisen from their fantasies or needs. Sharing one's own perspective and thoughts makes subjective perception more permeable to the intersubjective experience of the environment. This makes the Metaverse a place where many perceptions can come together to form a collective view. For the *Ndinguwe* experiment, the Metaverse is a place where different people embody different avatars and can, therefore, have experiences similar to those of the other actors. *Ndinguwe* is an approach to the potential of the Metaverse to explore shared experiences through body transference.

Let's Play the Metaverse as Artistic Researchers in Experimental Settings!

Since this text is about the playful experience of *Ndinguwe*, excerpts from seven evaluations from the theater scene are considered. These include the three actors Sarah Quarshie, Adi Hrustemović, and Ekkehard Freye from Dortmund Theater, who gave their voices to the avatars and the other spoken passages. Of particular interest here is the subjective processing of one's own voice when it simultaneously functions as the voice of the avatars' thoughts. In addition, the evaluations by theater director Thomas Krupa, stage and costume designer Monika Gora, theater publishing director Dirk Hanke, and the director of the Academy for Theater and Digitality, Marcus Lobbes, will be analyzed (see Figure 1). It is especially interesting to have the individual perspectives of the various viewpoints. Due to their artistic work in the theater, the interviewees have an increased sensitivity to

role changes, empathy, perception, and playfulness. These characteristics enable them to incorporate their practical experiences into their observations.[10]

LET'S PLAY *NDINGUWE*[11]!

Introduction

The word *Ndinguwe* means "I am you" in the Xhosa language and goes back to Nelson Mandela. He coined the philosophical term *Ubuntu*, which means "I am because we are." *Ndinguwe* is a schematic reduction and further development of this concept of existence. The experiment is a research project by the storyLab kiU at the Dortmund University of Applied Science, in which the subjective experience of MR, virtual self-representation, and haptic feedback within XR are examined. The project was developed and implemented using Unity software over a period of around six months. This involved working with photogrammetric scans (Montepulciano corridor) or a three-dimensional city model of Dortmund (Google Earth). The design of the virtual environment, thus, takes up familiar aspects of the environment but alienates them to create a fictitious, virtual non-place that has no topographical context. The intention was to create a varied and unfamiliar perceptual offer for the participants in order to stimulate a wide variety of reactions.

In the experiment, the optical self-perception is overlaid with virtual avatars equipped with characteristics that could potentially be discriminated against (such as age, gender, physical characteristics, and ethnicity). The intention is to investigate the extent to which the participants develop empathy towards their avatars, identify with them, or reject them. The simulated first-person perspective of these existences is experienced by the participants and reflected on together with the research team. Furthermore, references are made to haptic objects, such as a ball or chair, which become interactive components of the action. No visible control elements are used in the application. Instead, interactions take place through the physical behavior of the participants, an experience that is familiar to them from their everyday lives.

10 Cf. evaluation videos: Tobias Bieseke: "Ndinguwe Evaluationsvideos Theaterspektrum." *Tobias Bieseke*. November 10, 2023, YouTube Playlist, https://www.youtube.com/playlist?list= PLM5l1cypHpWmSyNQQ_D3P27suBBu0oi09

11 A short trailer of the experiment can be viewed here: Ndinguwe—"I am you," February 23, 2024, Vimeo, Video, 09:22, https://vimeo.com/915943769

The experience is composed of seven scenes. In the first scene (1. MR Intro), the participants open *Ndinguwe's* entrance. In the second scene (2. The Corridor of Montepulciano), the participants enter the virtual world via an MR transition. In the third scene (3. The Mirror Room), the participants can experience four different avatars with their respective biographies. In the fourth scene (4. The MR Mirror Room), the participants are assigned an avatar, which they see together with their physical selves. In the fifth scene (5. Ballgame in the Park), the participants interact with virtual balls and their avatars. In the sixth scene (6. Haptically Feedback), there is a physical ball and chair for interaction. In the seventh scene (7. The MR Outro), the participants return to the natural environment where the experience is reflected on again.

The sections of the experiment are briefly explained below and then excerpts from relevant observations are reproduced.

1 Let's Play the MR Intro of *Ndinguwe*!

The HMD, with the active application running, is placed on the participants' heads at a defined starting point. They will see the real space with the addition of a portal in which a cube is floating (see Figure 2). The word *Ndinguwe* is written in the cube. The words are repeated continuously: "Touch the ring and follow the circle to enter the rabbit hole." When the participants go to the portal and move their hands along the outer ring, the loading function of the first scene starts. The participants are instructed to describe their haptic, associative, and cognitive experiences. In this first part, the aim is to find out how the participants experience contact with the generated virtual object. The resulting statements are transcribed[12] and excerpted here:[13]

Sarah: *"But there are no electric shocks or anything? (Touches the ring) I feel like I'm touching something; that's why I asked about the electric shock."*

Adi: *"It was actually as if I was touching something, even though there was nothing there."*

Marcus: *"I can feel a clear contact."*

12 "Transkriptionen Evaluation Ndinguwe Let's play—Google Drive," accessed November 9, 2023, see https://drive.google.com/drive/folders/1lzQrB0PicmxKfpLCQ4Xx5sprVec6xSFj?usp=share_link

13 The texts have been slightly edited to improve the flow.

Thomas: *"Now I'm inside. My body doesn't exist."*

Dirk: *"It wasn't physical, but of course, I felt a sensitive connection. Through the eyes in my hand."*

The reactions show that the contact of one's own hand with the virtual object is subjectively perceived. Although this is not described as physical or haptic, it is described as a kind of sensitive force field.

2 Let's Play the Corridor to *Ndinguwe*!

Once the loading process is complete, the MR application starts. A virtual corridor moves toward the participants. Numerous holes provide a view of the real environment. The walls of the corridor at Palazzo Ricci in Montepulciano,[14] Italy, are adorned with video portraits. A voice can be heard off-screen, reading a poetic text out loud. Visually, the corridor envelops the participants and slowly passes them by. At the end, the participants reach a room hidden behind a curtain. A ball appears and, after a short pause, flies towards the participants' heads. The next scene loads. In the new scenario, the aim is to find out how the participants experience the transition from the real environment to a virtual world while both worlds are still visible.

Sarah: *"It feels like a loss of body. I hardly notice the real world behind the holes because I find it so exciting in here."*

Adi: *"That's great. So, I know that I'm actually somewhere else, in real space, but I actually feel somewhere else."*

Ekkehard: *"The holes initially create a pleasant feeling. To have this connection, that the old is still there for safety (looks through a hole). So now that I see the armchair here."*

Marcus: *"The concentration goes into the virtual plane and the sound because the intensity picks you up in a completely different way. The real space could also have disappeared."*

14 This is a photogrammetric scan of the upper corridor, referring to a first pioneering experiment. Cf. Bieseke, Tobias: "Draw a Straight Line and Follow it!," in: Georg Trogemann et al., *Montepulciano Journal—The Poetics of Making*, Köln: Verlag der Kunsthochschule für Medien 2022, pp. 59-75, https://e-publications.khm.de/frontdoor/index/index/docId/238

Monika: *"I just drove through this post. Do we now see in this play that the outside space exists? It's reassuring to see the red curtains that you know from the theater."*

Thomas: *"Now I come to the curtain. On the lower stage is the real space. I'm coming up against the wall now, probably."*

During the moving transition, it is not a problem for any of the participants (physically or cognitively) that the virtual space moves in the opposite direction to their subjective body perception. The optical holes in the virtual surface are understood as anchor points for their own perception. The moving and unfamiliar virtual surface is generally perceived as an event on which the focus of attention lies.

3 Let's Play the Mirror Room of *Ndinguwe*!

The mirror room is a snail shell-like mussel. In this room, the participants start at an archway and circle a central column, encountering a mirror that shows them the virtual representation of their avatar. An inner monologue of the respective avatar can be heard near the mirror, referring to his or her individual fate. The participants can now try out their actions in front of the mirror while listening to the figure's narrative.[15] Their visual representation is limited to gestures, the upper body, and the position and movement of the fingers. No facial expressions are shown, and the position of the legs is calculated under the position of the upper body using an algorithm. This causes the legs to follow the movement of the upper body with a slight time delay, sometimes with a grotesque appearance.

When the participants pass through the archway, their respective avatar transforms in the following order: a.) the avatar is a transgender man, b.) the then avatar transforms into a woman without an arm, c.) the avatar changes into an old man with dementia, and d.) and finally, the avatar changes to a refugee who is a person of color.[16] The choice of characters is based on including characteristics that favor discrimination (age, sexuality, physical impairment, and ethnicity). There is a transformation process from passive to active interaction because depending on

15 The textbook with all language passages can be viewed here: Bieseke, Tobias, "Ndinguwe Drehbuch," Google Drive, accessed 9. November 2023, https://drive.google.com/file/d/1Zde7qnUmyKiMkCQ3nLXsald6alJ5wVX/view?usp=share_link

16 Cf. Peck, Tabitha C. et al.: "Putting Yourself in the Skin of a Black Avatar Reduces Implicit Racial Bias," *Consciousness and Cognition* 22, no. 3 (September 2013), pp. 779-787. https://doi.org/10.1016/j.concog.2013.04.016

how much time the participants spend with a character in front of the mirror, the character changes for the subsequent scenes. Once the participants have followed the arrows around the center four times, the next room is loaded. In this process, it is essential to describe how the participants deal with the various virtual self-representations with regard to identification, empathy, or antipathy.

Sarah: *(She stands in front of the young woman without a hand, to whom she has given her voice). "The voice comes from the figure although it is my voice, I don't feel it as my own inner voice because thoughts feel different." (She comes to the story of the refugee Mouhamed Dramé*[17]*, who was shot dead by Dortmund's police in 2022. She observes the hands and listens to the text: "One second between pepper spray, taser, and six shots. I'm sitting in front of a clinic, leaning against a wall. I have come all this way to start a better life. On the way, I have had to watch people die. I could have been one of them. Nevertheless, I continued the long journey, and now I'm here. I am 16, severely traumatized in a foreign country. I don't speak the language. All alone. I'm on my own and don't know what else to do but turn the knife on myself. The police arrive. Suddenly, everything happens very quickly. One second between pepper spray, taser, and six shots. Measures to protect me, they say. Of course, I won't survive. I die." When the story is over, she is silent for a while and looks at her hands—a moment of sadness).* "*I've just reached the last person, the black man, and that's what touched me the most (she speaks in an undertone). I feel what he says (see Figure 3). It's the closest thing to me." (It is visibly close to her; it seems as if she is partly in her own world of thoughts. The experimenter tries to explain why this work exists; she ignores him, goes to the virtual memorial, and then on to leave the room).*

Adi: *(Adi comes to the first character to whom he has given his voice) "I think it's fantastic with the text and what I see. Because that's not me, and that's why the text is wonderful about life in the wrong body. So, I know that I recorded the text. Somehow, I am decoupled from the medium. It's as if someone else were speaking it. Perhaps the character actually sees me as an image in the mirror and not the other way around. (Adi comes to the old man). Ah, well, I don't know how to categorize the figure. At first, when I couldn't see the face, I thought ok, it's a woman, a bit older because of the gray hair. But then, with the voice, it was a man. I*

17 Cf. Peters, David: "Tödliche Schüsse auf Mouhamed Dramé: Anklage gegen fünf Polizeikräfte," *WDR*, November 23, 2023, https://www1.wdr.de/nachrichten/ruhrgebiet/anklagen-fall-mouhamed-100.html

realized it wasn't a dress but a patient in a hospital coat. [...] It has an ambivalence because the first figure had a clear male body and the second a clear female body. This is in-between, which is not due to the body, but to the mental state."

Ekkehard: *(Reacts to the old man to whom he gave his voice). "Well, I perceive it playfully because I am naturally so firmly convinced of the look of my appearance. The haptic and visual sensations combine in a pleasant way. [...] (Raises his arms above his head and listens to the voice) [...] (Ekki has experienced the story of the refugee) Now just in the context of the urban local awareness of the story. It goes hand in hand with the direct memory of what it was like when I walked through the city and saw Dortmund police. Very sad and shameful."*

Marcus: *"I see it as a game. It doesn't do much for me or my body, but I find it incredibly exciting. Maybe that's because of my biography as a hardcore gamer. PC above all. I'm always curious to see what else is possible in terms of worlds and interactions. Immersion. I haven't seen this one yet. [...] It's a bit irritating that the faces of the avatars don't speak. That you only hear their voice."*

Monika: *"Now I'm someone who doesn't look in the mirror that often. That's not my usual view of myself. But I'm used to seeing other people in the mirror because of my job. It feels like fitting for me right now. Intuitively, I would leave the mirror and look at the rest. The surface of the cave looks like a skin. [...] It looks like an underarm in the room. Like some kind of joint. But I have no problem being in a body. That's probably my interest in bodies or living beings in general. (Looks down at herself) Ah, I'm just now realizing that I have the body of a figure. It's a bit creepy to see the body on myself. Of a body that is no longer quite young. Shall I keep following the arrows? Ah, it's a different body, a different story. So, every circle is like a cycle, really. You could say like a rebirth. [...] (She comes to the story of the person of colored avatar and looks at her hands). You can see something, like graphic errors, here on the hand, like stitches or injuries. As a costume designer, I immediately think this slit is already a trace of the assault that's going on. I think it's good to have a different skin color. So, you can read an avatar like this as a costume."*

Thomas: *"What happens if I get really close? Are you me? No, that's me. (He makes a finger gesture and takes the haptic touch of his body as proof of his existence). At the end of the day, we move into the cages we build for ourselves. No criticism. (Walks in a circle) Now I'm with Dortmund's George Floyd. (Looks at himself in the mirror and listens). That's the most exciting character for me because I'm slipping into an avatar whose path I don't even know in my experience. It's a real story. So it can also be verified. Now I'm going to your grave—my grave. The picture of the boy. Some black liquid on the ground, like oil. Behind it,*

something red that I can't identify. [...] This digital mask here is not blackface[18] *for me because it's a real experience that you want to make accessible. It is authentic. It's overwhelming that you have dark skin, and I can imagine people interpreting that as blackface. For me, I don't see it as pretentiousness because I see it more as recapitulation. I bring his life back to life with my physical experience. If you don't know the story, you can be accused of blackface. Because then it seems too easy."*

Dirk: *(Is with the young man who doubts his sexual identity) "The body feels strange. The text I hear about body experience and identity triggers chains of associations for me. Questions that I had as a teenager. When you thought, is that me I see there or who is that person [...] (comes to the young woman) that's interesting. I'm a young woman, but I'm obviously missing my left hand. She doesn't swing her hips otherwise she does everything at the top. (Listens to the text). There's a young woman standing in front of me, and here's a 60-year-old man. Interesting things that this triggers because it really alienates me from my body image. [...] (He comes to the refugee avatar) If I can't communicate, if I can't build a social relationship, I'm lost. I've just been pulled fully into the story, and that's why I'm so silent. The horrifying images that run parallel to this story because, unfortunately, you hear these stories too often in recent years."*

A high level of empathy is found in Sarah when she experiences the contextualized figure of Mouhamed Dramé. Due to the personal impact of the narrative, but also the virtual reproduction, the experience is so intense that only a protesting silence remains. The other avatars are identified as virtual representations but are not perceived as personalities. This does not change for the actors when they hear their own voices. Experienced events differ from reproduced events and are accordingly internalized differently by the subjects. The narrations of the voiceovers are identified with the avatars but not with the personal self. Nevertheless, depending on the participants' personal access to the stories, states of empathy arise.

4 Let's Play the MR Mirror Room of *Ndinguwe*!

In this room, the participants arrive in the MR and find a virtual as well as a real mirror. In the virtual mirror, they are shown the avatar with whom they spent the

18 The term *blackface* describes the representation of black people by white people using make-up to imitate black skin. Blackface is seen as racist as it undermines the discriminatory experiences of people of color while prioritizing personal pleasure.

most time in their particular room. In the real mirror, they see their physical reflection (with their HMD). When the participants look down at themselves, they see their physical body optically superimposed on the virtual body. This visual experience of superimposing a virtual avatar offers a different view of the body and its virtual representation. After a period of 1.5 minutes, the next room is loaded. In this MR, the experience of the visual relationship with the avatar is described in terms of similarities and differences in order to determine the connection to the respective figure.

Sarah: *(Is embodied by the person of color avatar). "For me, the virtual figure is not foreign. Because I'm black myself, it's very close to me, closer than the others."*

Adi: *(Is embodied by the old man). "So you are you, and you are me. You see yourself and as the other. That's surreal. You immediately identify yourself. Maybe it's because of my profession, but for me, it means that I am this figure."*

Marcus: *(Is embodied by the old man). "I see my real hand reflected in the mirror at the same time, so the virtual self is not there (see Figure 4)."*

Moni: *(Being impersonated by the person of color avatar) "I'm still in the person of color avatar, with black leather pants."*

Thomas: *(Is embodied by the person of color avatar). "It also shows the difference between an older white man and a young person of color man. In the mirror, I am me, and on my hands, I am the person of color man."*

It should be noted that the figure in the virtual mirror is perceived as a stranger. The normal mirror image, on the other hand, is accepted as one's own person as usual. Interestingly, however, the virtual superimposition of one's own body is also accepted as one's own body with a kind of costume.

5 Let's Play the Ballgame in the Park of *Ndinguwe*!

The fourth room is a three-dimensional abstraction of Dortmund's "Stadtgarten," i.e., municipal park. Embedded in a sphere of sound, the voiceover provides indications of what awaits the participants. An abstract structure appears, similar to a tree, from which balls are shot at the participants. They can either hit the balls away or dodge them. The firing of the ball is interrupted twice with a short pause, during which the voiceover speaks again. With every break, the shot frequency increases, and the balls come from additional directions. If participants are hit on the head, their field of vision is colored orange and blurred. Participants cannot

succeed in this situation: neither can all the balls be fended off, nor can the participants avoid them all. This, therefore, creates a stressful situation in which unforeseen events may occur. This scenario aims to describe the physical experience of interacting with virtual objects.

Sarah: *"Well, I don't see any balls (as she turns around, a ball flies towards her head. She gets scared, tries to dodge, and falls to the ground). I take it a little bit too seriously (laughs)."*

Ekkehard: *"Somehow haptic, but actually because the balls react."*

Thomas: *"When I catch the ball, and it's bounced back, I experience a tactile sensation, but when it goes through me, I don't really feel it. For example, it was much faster now. Haptic is perhaps the wrong word; maybe contact is better."*

Dirk: *"I'm supposed to hit the balls away with my virtual hands? That's bad because I'm actually left-handed. But I have to live with it now. There was a ball. (Mainly knocks the balls away with his right hand)."*

After this phase, a double appears in front of the participants, an avatar that imitates their movements but remains in one place. It behaves differently from a mirror image. When the participants raise their left arm, the double also raises their left arm, and vice versa (participant perspective). The avatar is, therefore, not mirror-inverted. The participants are asked to pass the ball back and forth with themselves.

Sarah: *(Goes to the doppelganger and shakes hands). "It feels like I can really touch him, but I realize that I'm only grasping at air. I have the feeling I can feel him. (She approaches him, takes him in her arms, and touches him almost tenderly)."*

Adi: *"I'll try again, ah almost (the double has touched the ball, he walks closer to the double, takes only one arm, and the ball bounces back and forth between both hands) Yes, I did it."*

Ekkehard: *(Goes to the doppelganger) "All right, then I'll shake your hand, yourself. (The hands touch) Oh, that triggers something in my hand and arm. It's strange, this disembodied connection."*

Marcus: *(Goes to his double and shakes his hand, while the experimenter also shakes his hand) "Cool, that's going well (see Figure 5). (He tries to pass the ball to himself again) Almost. I've done something like that before with my feet, kicking*

the ball. That worked at some point, but this is very tricky. I understand how it works intellectually, but it just doesn't work."

Monika: *"Touching is strange because it's still not a double for me. And because I know that everything is artificially created. In my head and my soul, I know that I look different. The other is a surface. The sensation and experience of the self is deeper."*

Dirk: *"Now let's do it synchronized here, my avatar and me. I'll go and shake hands. That's cool. It feels like I'm feeling the warmth through the palm of my hand. That's weird. The things my head triggers. It's like feeling an electrical impulse. I don't feel it in my body but in my head."*

Similar to touching the ring at the start of the project, touching the virtual balls is also described as a feeling of contact. Sarah is so shocked by the ball that when she turns around, she falls down, even though there is no physical contact with the ball. This shows that viewing builds up the expectation of a physical sensation. Touches that elude haptic verification (the ball bouncing away, the portal disappearing) are classified as more real than contacts that should be constant (the doppelganger's hand). It is particularly remarkable that Adi managed to pass the ball to himself, which makes him the only participant to have succeeded in doing so. This is perhaps due to the high degree of physical self-control of an actor.

6 Let's Play the Haptic Feedback and Fly Through *Ndinguwe*!

The previous room goes dark and the participants are invisible again. The participants are now told they have to catch a ball again. This ball is tracked with an HMD controller that is integrated into the ball and is accordingly physically and virtually present. In this last scenario, the effect of haptic feedback on the virtual representation is examined. Particular attention is paid to the credibility of unnatural experiences (flying on a chair) and their classification of reality.

Dirk: *"Ah, great, I've got the ball. Well, it doesn't have a closed surface like the ball. I see. (The experimenter throws the ball to the participant, where the ball bounces off the participant's hands and falls down. A miscalculation causes the ball to bounce back into the participant's hands) That was pretty good because it fell down, and then it bounced up again, and then, of course, I wanted to grab it and reach into the void. It's a similar experience to the feeling of falling, except I'm not falling. I'm sensorily engaged in a different way. It's an interesting experience to reach into the void when you've had it before. [...] The haptic feedback*

absolutely changes the relationship to the surrounding space (Figure 11). It's a great experience. Because here is real (points to the ball) and there is not (points to the environment)."

Soon, a chair appears, once as a transparent green silhouette and once as a wooden chair. The wooden chair is also equipped with a controller to display it in VR. When the participants place the wooden chair onto the transparent green chair, a countdown starts, and they are asked to take a seat. A virtual flight through Dortmund begins. This is accompanied by a poetic text from the voiceover while the chair flies upwards in glistening light.

Sarah: *"Now I understand why gamers sit in front of the PC all day. The ball and the chair give me security. Without it, I would be completely lost and think I was really falling."*

Adi: *"Oh God. Fantastic. I'm actually afraid of heights. Although it feels real, it's pleasant. No feeling of fear. There's a tingling sensation just now that I'm flying really high."*[19]

Ekkehard: *"The haptic gives a form of hold, that you still have something with you (see Figure 6). I can also state this as a general feeling, as a toy, a talisman, food, in the broadest sense. It's appealing to see how the ball passes through me. It stimulates the fantasy of disembodiment."*

Monika: *"Now I'm about to smash into the helicopters. But they're more like plants. Now I'm crashing through a plane of glass, where I think it is one. But it's not. The buildings immediately make me think of Ukraine, which isn't nice. Now the skyscrapers are growing, ah no, they're dissolving."*

Thomas: *"The superimposition of the green and the real chair is doing something to me right now. So, the flight starts. Now, I'm looking at the world from above. I can't see the real world, but I can see a designed world."*

Most participants are of the opinion that the impression of reality can be significantly increased through haptic feedback. The ball becomes a point of reference (talisman) where what you see corresponds to what you feel. The difference between the haptic mesh structure and the visual surface structure of the ball does

19 Jeremy Bailenson has already used VR in his experiments to treat phobias. Cf. Bailenson, Jeremy: *Experience on Demand: What Virtual Reality Is, How It Works, and What It Can Do*, New York, NY: W. W. Norton & Company 2018.

not cancel this out. Due to the physical presence of the chair, the idea of flying is also described as more intense than when the participants are standing. In the near future, hybrid objects, i.e., real physical objects that have an authentic or modified virtual representation, will play an important role in the Metaverse. These objects, which are separate from the body, exist as mediating objects between the Metaverse and the physical world.

7 Let's Play the MR Outro of *Ndinguwe*!

In the last scene, the participants are back in MR. The HMD should remain on in order to keep the test subjects in the experienced state. Suddenly, a bird appears, which flies towards the participants in a similar way to the balls before. This is to test if the haptic feedback has changed their perception of the virtual objects. The outro is used for a retrospective reflection on the experience. After the glasses are removed, the experiment is complete.

Adi: *"Flying was a long journey in a short space of time. (The crow comes, and he fends it off with his hand) A bird flew to my head. But I fended him off (see Figure 7). The experience was fluid, the one merged into the other. The experience was accepted as a matter of course. You connect with some figures more than others. It all came intuitively, naturally to me. [...] I had no impulse to look for a classic narration in the sense of a story. A basic mood was created. This created a form of narration but through the process. [...] Putting on the device and experiencing another world is the closest thing to a dream."*

Ekkehard: *"Because I know all three voices, I can make a good distinction between the virtual figures and the real people. I'm then more with the figure until I realize, ah, that's me now. [...] I have a mixed feeling because of the introduction about this corridor disappearing from the world into a room that no longer has an exit. Is it something protective or imprisoning? The dive through the darkness into the next room. A space like Ground Zero where memories of images connect with reality and create another world. The dive from the shelter into a courtyard where you are at the mercy of others. A journey from here to nothing. [...] What happens to me when I get out of VR, how does my reality change as a result of the experience?"*

Marcus: *"The fact that I'm being guided by you there makes it a bit different from what you would do in a video game. In a video game, you have to explore and investigate for yourself. I'm not sure if you've made me too comfortable, but it's not a video game, either. [...] But it was only when you told me to look down that*

I realized that everything I see in the mirror, I can also see on myself. I simply wouldn't have thought of that. Even when I knew the reflection belonged to me, the reflection was still a stage from a spectator position. But I had no problem with the figures. For me, it was an episodic play. In the beginning, there is reality, then it becomes more and more material. Which is a good build-up dramaturgy, so the aim is to get there. For me, the process was to make virtual reality more experienceable, or more real. If that's how you want to describe it. However, because we were in contact, I have to say that I can no longer tell whether it was one coherent story or lots of little ones.[20] *[...] The mirror was like a gate. It shows you where to go next."*

Thomas: *"I didn't see women as sexual objects, but as a state of being that was partly unknown to me. There is often the question of how many female parts I have in me, how much man is in me, and which parts I present. Of course, the focus is briefly on the sexual attributes, partly because you don't know how to behave. It had more to do with remodeling my body, which is also an issue for me personally. So, when you do a play like Orlando by Virginia Wolf, where a man becomes a woman through a journey through the centuries, which he feels is the better way to be, there's a lot of engagement with queer issues. For me, it got to the point where all the LGBTQ issues and the attitude towards them were to generate a different audience, to transform the audience's self-concept. [...] The figures struck me as stereotypes from video games. Perhaps more multi-faceted characters would be valuable. It would be interesting to see if it could be made more realistic so that it doesn't slip too far into the trivial."*

Dirk: *"It's exciting when I sit here, see the ball, and feel the weight. It's a challenge to listen to the lyrics and explore the body at the same time. These are effects that create identity. You reach other levels. The transfer of empathy happens quickly. It's similar to role-playing games, only the other way around. Here, I have a role and have to adapt it intellectually. In role-playing, I have the intellectual task, and I have to shape the role. [...] The authenticity of the story increases empathy. The fact that I see a picture and have a person in front of me whose life has been extinguished. Even though it's an artificial figure, I'd say I get into a deeper emotion than usual. It's amazing. Associatively, I also immediately realize that he is talking to me and telling me his story, it's like a therapy session. At that*

20 Janet Horowitz Murray describes the transformation from written linear narrative to computer-based narratives as a mosaic-like kaleidoscope that functions via fragmentation. Cf. Murray, Janet H.: *Hamlet on the Holodeck: The Future of Narrative in Cyberspace*, Cambridge, MA: MIT Press 1998, p. 155.

moment, I also pull out the stops to help and be understanding. At least, that's how I would understand it. [...] (Looks in the real mirror next to him) At the same time, I see myself in the mirror, in which only reality is shown, as it does not depict the virtual constructs. That is exciting. My eyes provide a different image to what I feel. When I bring the two images together, the real and the technical, then I am quite lost. And that's what will keep me busy for the next few days. Truthfulness."

Even if all participants who see the bird avoid it, it is not classified as haptic. This would probably have been different with a ball, but with the bird, the participants are aware that it is not physically present in the room. This means that the haptic feedback experienced is not automatically transferred to other virtual objects. The narrative the participants experience is associative and is brought into contact with their own lifeworld. Despite the different states of the scenarios (e.g., MR, VR, with or without body or haptics), the experience is read as a narrative with different passages. Accordingly, narration is not produced exclusively through experience but also through interaction.

RESULTS

Discussion

The descriptions of the participants from the theater context, who certainly have a high degree of imaginative power, show that a mental synthesis between the physical and virtual environment can arise within the Metaverse. This is significantly enhanced by haptic feedback, which intensifies the classification of reality. Although this is disturbed by perceptual differences, it is not destroyed. Represented objects act as points of contact between the environments and become familiar allies in a foreign environment. The MR level visually presents both environments side by side and enables a comparison. This quickly makes it clear which overlays of perception are multi-modal and which are only visual. It is clearly recognized that the bird only exists on the virtual level, which leads to the participants avoiding it as a reaction but not classifying it as real.

Although the virtual self-representation makes it possible to adopt a foreign, virtual body, this remains separate from one's own self, even if homologies (skin color, gender, or voice) exist. Regardless of what one's own body looks like; the doppelganger or mirror image remains a stranger. Although the narratives told create personal access to the virtual costumes, they are still perceived as separate from one's own self. If identification happens, it does not result from sensory

overlaps but from mental connections, such as identifying a similar lifeworld. The participants' interactions with the avatars open up a space for imagining their own strangeness. The playful interaction between the doppelgangers only succeeds in Adi's case, where the foreign self-representation could be brought into a cooperative coherence with the self. The physical and virtual found a good balance in the flight with the chair, as the haptic feedback increased the impression of reality to such an extent that it was perceived as an intense experience, which still left participants with some doubt so that none feared falling. The participants' perception shows that an increased power of imagination can benefit the mental connection between the physical and virtual environment.

Let's Play the Metaverse as Transparent Participants!

This evaluation procedure is intended to make visible which stimuli can arise through the experience of XR experiences in the context of artistic research. The procedure is like a stage that transforms the person into a transparent playhead. The observations generated can be interesting not only for the cultural sector but also for the entertainment industry or the content mediation of narratives within XR. Regardless of which sector we observe, immersion, according to Fritz Breithaupt, does not necessarily need good effects but good narratives, as these also work without images:

> "We can mentally detach ourselves from the one situation in which we find ourselves here and now and think ourselves into other situations, other worlds, other times, and other beings. And we not only think ourselves into these other presences but also understand, experience, and feel them, so to speak. With every narration, we immerse ourselves in a multidimensional virtual world without any special glasses. Large parts of our brain are involved in this process, precisely the parts that would also be active if we were in these situations ourselves. There are different words for this phenomenon. Psychologists speak of transportation and narratologists of immersion. In the field of virtual reality, the term simulation is often used."[21]

Accordingly, high-quality immersion cannot be separated from the narration. However, sensory perception adds further cognitive influences that are stronger when narration and technical representation work together. This characteristic justifies the intentions of artistic research and prompts a sensitive evaluation. In this

21 Breithaupt, Fritz: *Das narrative Gehirn: was unsere Neuronen erzählen*, Berlin: Suhrkamp 2022, p. 64, my translation.

evaluation, it becomes clear that virtual self-representation produces increased empathic relationships in people from the theater context. Although three actors gave their voices to the avatars, they were not able to identify with "their" avatar more than with the others. Thoughts are not inner voices and, accordingly, cannot be induced from the outside. The authenticity of the narrative is essential. The manipulative character of guiding functional texts in video games is accordingly unmasked and cancels out the authenticity of the atmosphere.

Conclusion

This work shows that the mental power of imagination can connect with the virtual environment of the Metaverse if the narratives have something to do with the realities of the recipients' lives. It is not enough just to make new, fantastic possibilities tangible; they must also be interwoven with ordinary experiences. For the participants to accept a narrative, it is not essential whether it is depicted in a particularly realistic way but whether the participants want to believe the narrative. To achieve this, the narratives must be plausibly integrated into the reality of life. For the VR design of the Metaverse, this means that the narrative needs to be partially coherent with the physical reality of the participants' lives. Elements must be recognizable and have a virtual extension. If the Metaverse has no grounding in the physical environment, it becomes an introspection of its creators and loses contact with the realities of its participants' lives. Therefore, the synthesis of the Metaverse with parts of reality seems inevitable. As a consequence, the experiences in the Metaverse will also influence and change the behavior of individuals in the physical world.

Haptics are consistently seen as enhancing the impression of reality. As soon as resistance or even pain comes into play, the illusion recedes. This view is expressed by Hans Blumenberg:

> "Reality is not so much an instance as a counter-instance. What touches us painfully is experienced as real, since with the exception of fabulous masochism—there should be no desire for pain and therefore no source of illusion."[22]

The fate of Mouhamed Dramé can also be read in this context, which makes the VR construct a catalyst for empathy. Accordingly, illusion and reality are able to

22 Blumenberg, Hans: *Realität und Realismus*, Berlin: Suhrkamp 2020, p. 111, my translation.

catalyze each other. With regard to MR, it should be noted that the prison described by Ekkehard is created by the HMD occupation of the senses. We are used to the existence of a spatial connection between the places we visit. If places cannot be revisited, the body is decoupled from the space. This can provoke insecurity under certain circumstances. It is worth noting that the HMD is now quickly disappearing into the background of perception, and the visual environment is partially merging with reality.[23] Putting down the HMD remains the only "cave exit" back into augmented reality.

A key point is the documentation of the initial contact. There are currently many people who have not had any intensive HMD-based XR experience. These participants judge the experiences intuitively based on their experiences from their usual lives and differentiate less between the real and technical world. This shared imaginary space enables the fantasy of a possible connection between the two worlds. The result is an intuitive self-image that leads to things being done that were not intended by the world creators.[24] In *Ndinguwe's* perception of virtual self-presentation, for example, there was often a discrepancy between the body as self-representation that you see when you look down and what you see in the mirror. The foreign mirror image was often less accepted than the virtual arms and hands, which were visually connected to the body through their visibility. The participants know their natural faces, and an altered self-representation makes them distance themselves internally.

The face of the mirror image, on the other hand, had no facial expressions and was sometimes colloquially classified as "uncanny."[25] Perhaps this also has to do with the fact that a mirror image is also an image. It is not the body itself but an image of the body in space. If one sees the body superimposed on the virtual form, there is no doubt about the authenticity of one's own body and its representation. However, a mirror image that behaves synchronously in space, detached from

23 Don Ihde would classify this as "embodiment relations," in which the technology disappears behind the perception of the subject. Cf. D. Ihde: *Technology and the Lifeworld*, p. 40.

24 This terminology comes from Hartmut Koenitz, who uses the term "creator" to emphasize the distinction of literary authors as system creators and narrative architects. Cf. Koenitz, Hartmut: *Understanding Interactive Digital Narrative: Immersive Expressions for a Complex Time*, Abingdon/Oxon New York, NY: Routledge 2023, p. 20.

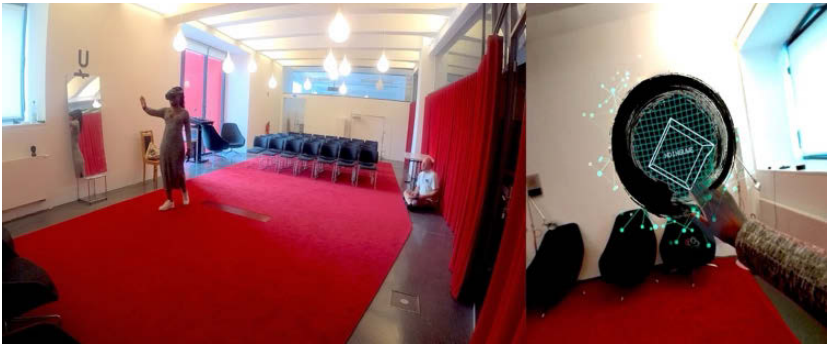
25 Mori, Masahiro/Karl MacDorman/Kageki, Norri, "The Uncanny Valley [From the Field]," *IEEE Robotics & Automation Magazine* 19, no. 2 (June 2012), pp. 98-100. https://doi.org/10.1109/MRA.2012.2192811

your own self, is like a stranger imitating you. There were, for example, participants who walked through their mirror image. Afterward, they described the feeling as if the mirror image had entered into a connection with the self-representation. This mechanic is a potential intuitive connection to an avatar. In the future, this research should enable interactive storytelling of art and culture (e.g., theater) in the Metaverse.

Figure 1: Experiment participants

Left:
Sarah Quarshie,
Adi Hrustemović
Ekkehard Freye
Below:
Thomas Krupa,
Monika Gora,
Dirk Hanke
Marcus Lobbes

Figure 2: Camera view capturing the perspective from outside



Photos and Screenshots by T. Bieseke

Figure 3: Sarah, in the moment of realization

Figure 4: Marcus sees his own reflection and the virtual overlay of his own body

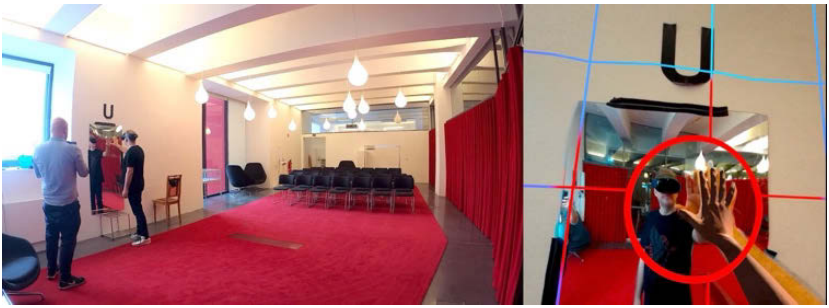


Figure 5: Experimenter returns Marcus' handshake with his doppelganger

Photos and Screenshots by T. Bieseke

Figure 6: Ekkehard places the tracked chair onto the green silhouette

Figure 7: Adi reflexively fends off the approaching bird

Photos and Screenshots by T. Bieseke

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