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Interactive Hallucinations. Virtual Reality, Augmented Reality and AVATAR Therapy for Disordered Imagination in Schizophrenia

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Abstract. This article explores the potential of digital and interactive images as therapeutic tools for alleviating the most debilitating symptoms of schizophrenia. It discusses virtual reality (VR) images, which have been shown to be effective in treating delusions and simulating real-life scenarios, as well as augmented reality (AR) images, which raise awareness about this condition and soften the associated stigma. Finally, it covers AVATAR Therapy images, which are primarily employed to reduce or eliminate auditory hallucinations. The article will explain how using interactive images can strengthen the «narrative self» of schizophrenic people and their interactive bond with the outside world, by approaching schizophrenia as a disorder of the imagination.

Keywords. Schizophrenia; imagination; VR/AR; avatar therapy; operative images.

1. *Schizophrenia simulator*

On his TikTok page (@xoradmagical), artist Christopher Grant shares videos depicting his daily life living with schizophrenia. In some vid-

eos, he talks about his condition while he draws complex mosaics of faces[1]. Others are labelled by the artist as «schizophrenia simulator». In these videos, Grant films interior scenes, such as his home or a shopping centre, and natural settings, to which he digitally adds the faces he usually draws. Similar to the more common augmented reality filters applied to filmed scenes to modify the appearance of the subject, Grant's hallucinatory faces follow him tirelessly throughout his activities, whispering or screaming, sometimes friendly, sometimes disturbing, sometimes downright persecutory[2].

Grant's simulator aims to raise awareness among other users of the platform about conditions like his own. His decision to use TikTok for this purpose is undoubtedly successful (@xoradmagical has 1.6 million of followers), and by no means an isolated case. This article will explore how certain digital technologies such as virtual reality (VR), augmented reality (AR) and AVATAR Therapy can be used to provide information about schizophrenia and treat those with the condition. Indeed, these technologies produce «operational images» aimed at a therapeutic function: engaging with one's own imaginative process, they can alleviate the distress caused by certain symptoms, particularly delusions, hallucinations, and stigmatization. But what does the imaginative process have to do with schizophrenia? And how can a «simple» digital image be an effective therapy?

2. *Schizophrenia and disordered imagination*

According to a rich philosophical tradition, imagination is the core process through which one interacts with their environment (Pirandello [2025]: 45-48). It plays a fundamental role in interpreting the potential of daily experiences, enabling human beings to creatively overcome their deficiencies in order to survive. To this end, the human body is constantly connecting with found and constructed elements: we are born «*homo faber*» because we naturally seek to expand ourselves within a material techno-culture.

This coupling is neither neutral nor mechanical. While other animals also build tools, human beings are unique in that their senses are reconfigured by their artefacts (Ihde, Malafouris [2019]). Individuals develop precisely through the process of hybridisation with the outside world, including inanimate objects (Parisi [2019]: 17). We are constantly negotiating the boundaries of our mind, which do not coincide with those of our body. Inert materials, objects and tools certainly do not think for us. However, every aspect of the mind, including the

1 https://www.tiktok.com/t/ZP8BqxQw4/.
2 https://www.tiktok.com/t/ZP8BqypHK/.

emotional and affective dimensions in the broad sense, results from interactions with them (Gell [1998]).

From this perspective, the mind emerges from the synergistic process of internal and external resources, both of which are equally decisive for its constitution (Malafouris [2013]). This harmony consists of friction, resistance and stiffness, but not open conflict or total estrangement. The environment does not merely present opportunities for thought; it resists and responds to us. Like an electric current that is activated only when distinct elements come into contact with each other, the mind exists only in relation to something else. The brain and the body alone are insufficient for the formation of thought. Without individuals, an environment is merely a space. The activity of the imagination is produced through the constant integration of human and non-human, animate and inanimate elements.

Emphasising the role of imagination in our everyday perception of the world highlights its material quality, rejecting the idea that it is instead ephemeral and purely representational (Koukouti, Malafouris [2020]: 30). On the contrary, it is the creative act through which we «grasp» the world: a form of understanding anchored to the specific situation in which it develops. Although it can certainly foreshadow potentialities that are not yet in place, it does so at the very moment of perception. Rather than thinking about things, we think *with* and *through* them, by effect of a sort of «material engagement» (Malafouris [2013]). Indeed, without things and before things, there is no thought.

Often confused with memory, imagination is also made of «expectation, planning» (Gehlen [1950]: 309). It is necessary for exploring space, combining material from different perception modalities, and enabling us to plan for the future and recreate the past. This allows us to understand the present context while travelling through time without physically moving.

Numerous studies have identified a neural system dedicated to it. Known as the «default network», this system comprises several brain subsystems that are particularly active when we are at rest, asleep, daydreaming or planning, or when we are trying to understand the thoughts behind another person's actions (i.e. mentalising) (Gerrans, Mulligan [2013]). It is widely believed that the default network alternates its activity with that of areas involved in executing tasks within the environment and that it alleviates boredom by filling empty moments with recollections of personal experiences or thoughts about interacting with others, whether actual or hypothetical (Raffaelli, Wilcox, Andrews-Hanna [2020]). However, it is also referred to as a «mental time travel» because it enables us to virtually relive the past and experiment with the future. Memory and imagination share many cognitive resources and are closely linked, to the extent that they cannot easily be distinguished (Beaty *et al*. [2018]; Schacter, Addis [2020]; Berninger, Vendrell Ferran [2023]). They are both creative and recreational: every

time we remember something, we imagine it; imagination involves reproducing content, but also creatively reconstructing it, each time in a different way. Furthermore, some studies that have not received much attention in the literature on this topic suggest that the default network is active during perceptual tasks (Greicius, Menon [2004]) and indeed underlies our entire experience. Its main functions include understanding space as we move through it (Alcaro, Carta [2019]), and the integrated systematisation of multimodal sensory information. Past experience is constantly investigated and searched through in continuous comparison with present information. It has therefore been suggested to consider this network as a form of attentiveness that extends to the entire environment, aimed at recognising the relationships between things within it. From this perspective, the default network is a kind of «watchfulness» interested in integrated patterns of relationships between different elements (Buckner, Andrews-Hanna, Schacter [2008]).

Thus, from the perspective of philosophy and cognitive science, body extension does not necessarily involve physical continuity. Instead, it is realised as a virtual location beyond the skin, an invisible hybridisation with the visible world (Merleau-Ponty [1945]: 82). As we constantly reach beyond the boundaries of the body in terms of both time and space, the rest of the environment falls fully within the realm of thought.

The imaginative and interactive relationship between people and objects is essential for adaptation. This is made evident by circumstances in which, by contrast, this relationship does not exist anymore. What happens when it is no longer possible to project oneself towards potential actions? The surrounding environment is deprived of its affordances. When confined to the strict dimension of the present, one's practical sense is lost, as is full awareness of the context.

One possible cause of this is schizophrenia. In fact, defining schizophrenia is the first difficulty encountered by those approaching the study of this condition. Despite having been diagnosed in the late 19th century and being widely studied today, schizophrenia remains difficult to classify. To start with, it is more accurately described as a spectrum of disorders (American Psychiatric Association [2022]). Secondly, it cannot be traced back solely to a pathology at the cellular level. Its triggering mechanisms are also environmental, social, familial and often traumatic, and cannot be clearly identified (Bollas [2015]; Kolker [2020]).

Typical symptoms of schizophrenia include altered thinking and perception, as well as an inadequate or absent emotional response. Patients often exhibit paranoid delusions of grandeur or persecution, and some may be convinced that their reasoning is being influenced, stolen, or controlled from the outside, or that it can be perceived by others. Other common symptoms are hallucinations (particularly auditory), confused and impoverished speech, and catatonia (McCutcheon, Reis Marques, Howes [2020]; American Psychiatric Association [2022]).

Contrary to popular belief, schizophrenia does not mean that a person has multiple personalities. The term «schizophrenia», coined by the psychiatrist Eugen Bleuler, rather refers to «a splitting of the various psychic functions» (Arieti [1955]: 13). People with schizophrenia live «on the edge of human perception» (Bollas [2015]: 3), which is normally guided by a series of «paradigms of perceptual organization» (ibid.: 181). One such paradigm is the ability to balance our interactive relationship with objects around us, which we are both autonomous from and influenced by. The schizophrenic condition radically challenges the common experience of the world, representing «another form of being human» (ibid.: 181). This is why the phenomenon is so difficult to fully understand: it is not a matter of considering patients *with* schizophrenia, but people who *are* schizophrenic (Laing [1959]). In short, the main structural disorders, which occur even before psychotic symptoms manifest, affect the following: «(a) the relationship between action and cognition; (b) the relationship between immediate and reflective givenness; (c) the implicit preconditions of experience, which are normally taken for granted; and (d) the intersubjective relationships» (Summa [2014]: 485-86).

For all these reasons, schizophrenia can be seen as a disorder of the imagination[3]. People with schizophrenia find it difficult to remember the past and adapt to their environment. Their relationship with their cognitive resources, including the outside world and their own body, changes radically. Consequently, they feel isolated, alone and fragmented. Their sense of precariousness is reinforced by the transformation of objects and people into strangers and threats that turn against them. Things lose their meaning and function (in other words, their affordances) and cannot be incorporated. Renée, the protagonist of *Autobiography of a Schizophrenic Girl*, claimed «things were tricking» her and said that she could no longer perceive them in relation to each other (Sechehaye [1950]: 55). Everything suddenly became «artificial, mechanical, electric» to her (ibid.: 31). Schizophrenic people lose the ability to use their imagination to mediate contact with their environment. Consequently, things become silent and meaningless, as if they are endowed with a mysterious and monstrous life, disconnected from each other and from the individual. Indeed, the «"reality" of the physical world and other persons ceases to be used as a pabulum for the creative exercise of imagination, and hence comes to have less and less significance in itself» (Laing [1959]: 85). The ability to feel sensations, such as pain, is still present, but the full perception of objects is lost. The lived environment becomes an aseptic, geometric space, where one's virtual projection is impossible.

3 For reasons other than those discussed here, also Gregory Currie and Ian Ravenscroft attribute schizophrenia to an imaginative alteration from a philosophical perspective ([2002]).

To a certain extent, the imagination always operates with absent objects; a minimal degree of derealisation is useful for reflection, understanding and planning. In people with schizophrenia, however, this process has gone too far[4]. While imagination usually involves «grasping» the environment, schizophrenic imagination fails to do so. Unable to «catch» it, it also fails to understand it. However, as the relationship with material things is essential for cognitive development, the world and the person fade simultaneously. By losing the vital relationship with part of their mind (namely, the environment) individuals also lose themselves. Reality can only become «warm, alive, affectively charged» (Sechehaye [1950]: 152), once the interactive link between one's internal and external cognitive resources has been restored. If imagination is fundamental to adapting to the environment, then psychosis can be interpreted as a serious form of maladjustment resulting in genuine disorientation (Summa [2014]: 479). As will be seen later, therapy should therefore attempt an imaginative rehabilitation.

Even individuals with schizophrenia who recognise the fictitious nature of their auditory and visual hallucinations cannot help but behave in response to them, as they are often terrified by what they see or hear (Bollas [2015]). As a matter of fact, we usually develop many hypotheses about the potentialities of our environment based on our experiences of what is and what isn't present in it, which both significantly influence the direction of our thinking. For example, a child who is afraid of the dark will remain so even if their parents assure them that there is nothing to worry about. Similarly, if a parent does not see their teenage child come home late at night, they may become anxious and assume that their child has had an accident. Despite having no proof that their child has actually been injured, they may call their child's friends and even alert the authorities (Gerrans, Mulligan [2013]). Anxiety, phobias, paranoia are not exclusive to people with schizophrenia, we all evaluate hypotheses about possible future situations in relation to our fears.

Therefore, schizophrenia exacerbates a tendency that is typical of human perception in general. Worldly experience is «strange» in that when we interact with objects in our environment or parts of our own body, we do not merely experience the object itself (Garroni [2005]). Rather, we perceive it in relation to other objects, what we know to be nearby but hidden, what has been and what could be, as well as what we desire or fear. In short, as Emilio Garroni wrote, the difficulty of the experience is that we are «essentially involved in things themselves or in the world» (ibid.: 6). This contact is so intense that we are as if «possessed» by it. As it is unintentional, it also often escapes us (ibid.: 99). For this reason,

4 Significantly, cases of «disordered» imagination are also characterised by hyperactivity in the default network (Whitfield-Gabrieli *et al*. [2009]; Buckner, Andrews-Hanna, Schacter [2008]; Buckner [2013]).

we all experience episodes of «non-recognition», when we are unable to make sense of our surroundings. Even parts of our own bodies can seem foreign to us, almost like hallucinations. For instance, upon waking in the morning, we might see our foot protruding from beneath the sheets and perceive it as an alien entity (ibid.: 33). Imagination is therefore a malleable process that unites the various aspects of the mind, which are scattered between the animate and the inanimate.

This process provides a consistent organisation of the experience, yet continually reconfigures itself. In order to prevent our rich and vital material «possessions» from becoming a malignant haunting, we tend to construct patterns that provide certainty and unity to the fragmented nature of our experience. In short, we build up a «narrative self» (Summa [2014]): the protagonist of interconnected events that we perceive as part of a sequence (Papineau [2016]). Like a reader who cannot immediately comprehend a text as a unified whole, the subject experiencing the world maintains a «wandering point of view» (Montani [2014]: 69) and processes what they encounter through progressive syntheses that become «a correlative of their consciousness» (ibid.). Just as we never have a conclusive view of a text, we will never have a conclusive view of reality: new syntheses are added to previous ones, reconfiguring them: «The past remains as a backdrop to the present, influencing it; at the same time it is itself modified by the present» (ibid.: 70). While reading, the subject constructs a new *Gestalt*, which they consider objective, but which is in fact the result of a continuous interaction with the text. And the other way around. Out of all the elements present, each reader selects those that seem most relevant, thus hypothesising certain future events. These expectations influence how we interpret what happens next, but they are also modified and reoriented by the text itself. Something similar happens in everyday perception. Thus, although some elements remain unchanged, the overall structure of our knowledge evolves. It is precisely this tendency that makes it possible to develop a therapy for some of the most debilitating symptoms of schizophrenia.

As we will see in the next paragraph, since we are predisposed to relating to things and objects, certain technologies are now being used to intervene in the schizophrenic imaginative processes, and reorient them towards the interactive relationships with the environment. Specific digital images are used to this aim. What kind of images are these? And how can the imagination of a person with schizophrenia enter into a therapeutic relationship with them?

3. *From technical delusion to technical therapy: VR, AR and AVATAR therapy*

The relationship between technology and schizophrenia is a much-discussed topic. Nevertheless, this bond is rarely perceived in a favourable way: the mass

media, in particular, have frequently been criticised for being the primary cause of dissociation within society. Based on the observation that electronic media increasingly control the environment and users, some individuals develop paranoid delusions of persecution directed against radio, television and computers (Sconce [2019]). While it is not possible to directly link the invention of certain technologies with the emergence of specific pathologies, it is worth considering their impact on mental health. After all, the existence of «technical delusions» should not be dismissed outright, given that a defining feature of modernity is «a constant inundation of delusional materials by television, radio, and the Internet» (ibid.: 18).

Indeed, as Marshall McLuhan noted in his classic distinction between «hot» and «cold» media (i.e. those requiring a low or high degree of interactivity, respectively), «the cooling of all senses tends to result in hallucination» (McLuhan [1964]: 32). So why not exploit this phenomenon to create interfaces through which the «hallucinator interacts with their imagined world, which has the character of reality for them» (Parisi, Sartori [2021]: 37)? Users could relate to synthetic environments or objects to reconfigure their experience as a result of what could be termed «operational immersiveness», which stimulate them «both cognitively and physically» (ibid.: 37), similar to that experienced when reading a text or exploring an environment in everyday life.

As schizophrenia is a spectrum of conditions, it is important to bear in mind that these are only partial solutions which often need to be accompanied by other therapies, both pharmacological and non-pharmacological, tailored to the individual's needs. However, antipsychotic drug therapies are often ineffective or have equally debilitating side effects. Digital therapies, on the other hand, have produced promising results in alleviating specific symptoms, with no significant adverse effects.

One such technology is virtual reality (VR), which helps to reduce hallucinations and delusions. Experienced through wearable devices, VR surrounds the user with a 360° synthetic environment that replaces the physical one. VR immersive habitable digital images allow users to look around and often move to interact with avatars and digital objects. Initially, VR can be used as a diagnostic tool for schizophrenia (Lan *et al*. [2023]). In therapeutic contexts, it is often employed alongside other interventions, such as Cognitive Behaviour Therapy, providing a context in which to perform exercises under the guidance of a digital coach or to gradually confront real-life scenarios that the patient perceives as less risky or more manageable (Spark *et al*. [2025]: 2). This enables patients to let their imagination engage with other individuals and things, and occasionally with their own perceptual distortions. «Reducing hallucination severity, persecutory beliefs, paranoia, depressive symptoms, negative affect, and anxiety» (ibid.), compared to other types of treatment VR produces significantly

better results, especially for delusions (ibid.: 7; Lan *et al*. [2023]). In this sense, VR appears to be a valuable tool for supporting Cognitive Behaviour Therapy, significantly enhancing its effects. Recently, it has also been suggested that VR could address movement abnormalities associated with schizophrenia, as has already been successfully achieved for certain neurological disorders (Pavlidou, Walther [2021]).

However, not only do schizophrenic people experience the symptoms of their condition, they are also often stigmatised, which considerably worsens their quality of life. As the artist Christopher Grant insightfully observed, certain technologies can accurately convey the experience of schizophrenia, thereby raising awareness of the condition. Healthcare professionals are among the main sources of judgement (Krogmeier *et al*. [2024]). To address this critical issue, augmented reality (AR) applications have been developed to improve public understanding of the disease and enable medical staff to experience the issues patients face firsthand (de C. Silva [2017]; Krogmeier *et al*. [2024]). Unlike VR, AR does not replace the physical environment, it rather integrates it with various types of digital content (such as interactive images, videos, texts, and audio tracks). This content can be enjoyed using portable devices, such as smartphones and tablets, or wearable devices, such as smart glasses or visors, which allow users to continue to see their surroundings. AR therefore applies to reality, inhabiting it with «ghostly» entities that are only visible to its users. A well-known example is Pokémon Go (released in 2016). Players aim to locate and capture as many Pokémon as possible, which are geolocated around the world and visible through the phone's camera. Players can then challenge each other in battles, either individually or in teams. The playing field is the everyday environment, to which new layers of reality are added that are only visible to players. Everyone else is a «Muggle», a term borrowed from the famous Harry Potter saga that refers to people without magical powers (Liberati [2018]: 217-18). Just as Grant's world (as well as the one of people with schizophrenia in general) cannot be shared intersubjectively, the world of Pokémon GO players is exclusive to participants. Although players know that digital Pokémon are fictional, they still attribute a certain degree of reality to them, modifying their movements and routines around the city accordingly. Players must reach locations where Pokémon are found, frame the indicated portion of space with the camera, and then throw a digital ball to capture them. AR entities are therefore complex images that can simulate peer communication and encourage users to move, act and react, even in other applications, whether they are video games or not.

Obviously, the experience of a player (or a social media user employing augmented filters) is not comparable to that of someone who is unable to control the entities that haunt them. Since «hallucination» is defined phenomenologically as perception without an object, it is more accurate to describe the situation

generated by AR as «para-hallucinatory» (Malaspina, Pinotti, Pirandello [2022]: 106). However, precisely because of this para-hallucinatory characteristic, some research groups have chosen to use AR to develop apps that simulate psychotic symptoms such as delusions and hallucinations. Medical students can use these apps to experience the daily lives of their schizophrenic patients as accurately as possible, while still being able to see their physical surroundings. For instance, *Live-It*, an educational tool for graduate-level healthcare students, provides simulations of auditory hallucinations, delusions, thought broadcasting, thought theft, self-neglect and lack of energy (Krogmeier *et al*. [2024]: 2). Significantly, the app's content is inspired by social media accounts of people with schizophrenia who share their experiences, including Grant's channel on YouTube, which mirrors his TikTok account.

VR is often referred to as «the ultimate empathy machine» (Milk [2015]). Wearing the headset transports you to places that are geographically, culturally and perceptually distant, enabling users to understand their potential and critical issues and gain insight into the perspectives of the people who live there, they say. However, complete immersion in an environment perceived as absolutely «alien» can sometimes create the traumatic impression of being attacked by frightening circumstances, generating the opposite effect to that desired. This can lead to a need to distance oneself from the stigmatised group, potentially reinforcing stigma and stereotypes (Krogmeier *et al*. [2024]: 2-3). On the other hand, AR offers the possibility of creating mixed scenarios that are not entirely simulated, making them more realistic for the user and eventually allowing them to engage with different situations in a more nuanced way. By offering a simulation that is at least partially similar to the user's everyday experience, AR can lead to greater empathy with others, while at the same time avoiding the effects of social distancing (ibid.).

AVATAR therapy is also based on this «cold» and interactive approach. As previously mentioned, many schizophrenic patients continue to experience auditory hallucinations, which are often aggressive and derogatory, even when the person is taking medications (Leff *et al*. [2014]: 166). AVATAR therapy enables patients to re-establish a dialogue with their voices through visual and auditory representations[5]. Although it is occasionally delivered via VR (Rus-Calafell [2020]), the most common setting is more akin to AR. Patients are invited to create an avatar representing the persecutory voice using a face generation programme on a computer. If they hear more than one voice, they are asked to select the most debilitating one. They then customise the avatar's appearance, clothing, expressions, background and tone with the therapist until they consider it to be faithful to the voice they hear. During dialogue sessions, the therapist moves

5 https://www.avatartherapy.co.uk/index.html.

to an adjacent room, leaving the patient to interact with their avatar on a computer screen. By pressing two different buttons in turn, the therapist can choose to speak either as the avatar or in their own voice, thereby guiding the patient through a series of exercises.

Without interrupting any ongoing treatment, the therapy involves a cycle of thirty-minute sessions over a period of at least six weeks. This gives patients the opportunity to build an interactive relationship with the avatar, which they can control to some extent. The avatar is presented as such, without deceiving the patient: for instance, «patients […] who are very timid in their first encounter with their avatar […] are reminded that the avatar is only a representation of their persecutor that they themselves have created» (Leff *et al*. [2014]: 173). However, during the sessions, patients become accustomed to addressing the persecutory entity directly and seeking strategies to deal with the problem. For instance, they explain their reasons and ask the hallucination to step aside, something they would not normally be able to do, as they lack the possibility to engage in confrontation. Conversely, during these exchanges, the avatar (who is actually the therapist) addresses the patient in an increasingly less aggressive manner, eventually becoming encouraging. The sessions are also recorded so patients can listen to them again at home, thereby strengthening their awareness of their ability to deal with their persecutor. In many cases, even after just a few sessions, patients report that the hallucinated voice appears less frequently, at lower volumes, and with gentler content until it disappears completely (ibid.: 168). For example, one patient, who had worked for a company for many years, was woken up every morning at 5 a.m. by the female voice of another executive, who discussed work matters throughout the day. Following his therapist's advice during AVATAR therapy, the patient began asking the voice to behave more professionally, to limit its appearances to working hours, and to prevent the disclosure of confidential company information. At first, the voice continued to appear, but only from 8 a.m. onwards. When it was requested to only appear in the afternoon to allow the patient to carry out his activities, it stopped appearing altogether. When asked what had happened, the patient said that «she» had simply left the room (ibid.: 169).

As we have seen, constructing stories is essential for understanding the world. In order to produce our «narrative self», the imagination needs to engage with perceptual data to create coherent patterns of meaning. However, with regard to auditory hallucinations, those who hear voices are normally unable to engage their imagination with a perceptual environment since they lack the interaction with an actual material object. Consequently, their experience of the voice remains static and offers no alternative stimuli. The schizophrenic patient is frozen in the present; their imagination is closed within itself, forced to repeat paranoid thoughts. AVATAR Therapy, on the other hand, provides an objective point of

reference, encouraging the patient to interpret the unexpected content it delivers (such as the voice's positive attitude towards them). The avatar enables the voice's presence to be perceived as real, shared and validated intersubjectively, ultimately allowing the patient to confront it face-to-face. Consequently, the patient's relationship with the voice itself changes: if the last time we spoke, the voice that used to offend me told me that it doesn't think I'm so bad after all, how will it reappear? Using structured narratives in therapy can therefore be very helpful. The individual incorporates previous instances in which the voice was supportive rather than aggressive as parts of their experience. In this way, their entire story is reoriented. The «narrative self as designating a higher and richer form of self-awareness […] presupposes the possibility of recognizing oneself as actor within a life history» (Summa [2014]: 478): with AVATAR Therapy, patients experience situations in which they are not victims of their own voices, but active interlocutors.

I propose considering this type of rehabilitation as «imaginative rehabilitation», based on the idea that «the more the virtual experience matches people's real-world experiences, the more likely they will be able to generalize the learned responses to their daily life […] focusing on associated meanings with the voice experience» (Rus-Calafell [2020]: 2). AVATAR Therapy's effectiveness demonstrates that, in order to be part of our mind, which is eminently interactive, others – whether they be things, people, materials, or malevolent entities – need to be autonomous. As the case of people with schizophrenia shows, without interaction, imaginative exploration literally loses its grip on the world. Since imagination holds together the various parts of the environment, mediating and modulating their collaboration, none of them is sufficient for its action when taken separately. While we might be more inclined to deny things an imagination without a human counterpart, the opposite is also true: it is the engagement with an object that triggers the opportunity to imagine, leaving very little (or nothing) for human beings to imagine outside of a relationship with matter.

4. *Conclusion*

Digital technologies have revived forms of animism towards images and objects that have always existed in various cultures (Freedberg [1989]). As we saw in the first paragraph, images and objects demand an interactive and reciprocal exchange, even when they do not resemble us physically. Given our daily involvement with material things, human perception and cognition are the result of constant interaction with artefacts. Since objects can be considered true social agents whose actions can have significant consequences, no image has ever been «just» an image. However, in the scientific literature on the subject,

it is frequently suggested that contemporary images have gained access to the human world in a different, more radical way. While images have always had a certain degree of agency, the defining feature of many of those produced in the last twenty years is their capacity to directly impact the physical world. In the contemporary media landscape, therefore, the autonomy and vitality of images have taken on an operational significance.

Many of the images used today in warfare, industry and medicine not only document processes and phenomena, but also act directly upon them: «These are images that do not represent an object, but rather are part of an operation» (Farocki [2004]: 17). The main innovation introduced by operational images is therefore their reversible agency: while they provide information through visualization, they also perform practical functions in the real world.

Some types of interactive digital image are also used in the treatment of patients with schizophrenia, exploiting mechanisms typical of everyday imaginative action. Interactive VR images are immersive representations that allow patients to explore synthetic environments where they can gradually confront real-life scenarios without perceiving the usual risks. On the other hand, responsive AR images confront others with conditions that they find difficult to truly understand. Finally, AVATAR Therapy uses representations of hallucinatory voices to insert itself directly into the patient's imaginative process and redirect it in order to restore their material involvement with the world.

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