

# VIRTUAL REALITY: THE FRONTIER OF PEACEMAKING

Alexandra Ivanovitch, October 2017



## Author

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## Introduction

Academics and artists alike praise virtual reality (VR) as the ultimate empathic medium which allows its users to walk a mile in another's shoes and open the doors of perception. Numerous evidence-based studies stemming from social neuroscience and cyberpsychology have shown virtual reality's potential as an instrument of self-transformation and transformation of interpersonal relationships. Professors Mel Slater and Jeremy Bailenson have respectively highlighted the role of virtual reality in the reduction of racist bias and the promotion of prosocial behavior.<sup>1</sup> As a unique immersive medium, which allows for shifts in perspectives from the first person point of view to the third person, virtual reality is an unparalleled tool that helps us transcend neurophysiological limitations inherent to our self-centered point of view, and to adopt the perspective of another human being.<sup>2</sup>

Beyond the early first-person perspective experiences that have premiered at film festivals and in fundraising events, creative initiatives in science and art using virtual reality have started to help build empathic interactions in conflict resolution settings. Is virtual reality part of the future of mediation and peacebuilding? This article explores the technological and scientific underpinnings of these early experiments and highlights the potential role and contributions that VR could make in the field of conflict resolution.

The paper calls for interdisciplinary action between mediation experts, technologists, academics and artists. It advocates for peacebuilders and mediators to pilot some of the VR set-ups that have been already proven to be successful at eliciting empathy in laboratories and other controlled contexts.

As a preliminary note, this article considers the term “empathy” to mean the ability to step into another's shoes, to understand, to be aware of, and to be sensitive to his or her feelings, thoughts and perceptions.

## The Neuroscience of VR as a Transformative Medium

Of all media, VR has the unique transformative power to induce behavioral change in participants, as demonstrated by numerous studies in cyberpsychology and social neurosciences. VR has immense power to induce illusions that cause people to feel they are experiencing an alternate reality, that the events happening in the virtual world are real, and even that their bodies have been substituted by an avatar, known as an “embodiment illusion”. Because the cognitive and perceptual illusion is so strong, the brain treats the information as though it were real. Participants respond realistically and

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<sup>1</sup> See: <http://publicationslist.org/data/melslater/ref-262/paper4.pdf>, and <https://vhil.stanford.edu/mm/2013/rosenberg-plos-virtual-superheroes.pdf>, T Peck, S Seinfeld, M Aglioti, M Slater (2013), Putting Yourself in the Skin of a Black Avatar Reduces Implicit Racial Bias, *Consciousness and Cognition*, Volume 22, Issue 3, September 2013, Pages 779–787.

<sup>2</sup> On the work of neurophysiologist Alain Berthoz, Professor at the Collège de France, on empathy and perspective-taking on a neurophysiological point of view. [http://www.diasporiques.org/Berthoz\\_29.pdf](http://www.diasporiques.org/Berthoz_29.pdf).

adapt their behavior accordingly in the virtual world. Strikingly, this virtual experience has real world effects, with behavioral changes observed in participants beyond the duration of the VR simulation.

What makes VR exceptionally strong as a tool for behavioral change is that, unlike any other method: (1) the change in behavior happens in spite of the fact that participants are aware of being in a simulation; and (2) VR creates a parallel reality with which participants can interact safely without facing the potentially adverse or harmful consequences that interaction itself – or an error made in the course of such interaction – would have in the real world.

## Identifying with Others

VR's capacity to elicit empathy has been highlighted by numerous mainstream articles and reports. However, how does that work in practice? What are the cognitive and psychological mechanisms underlying this phenomenon? And what is the scope of such applications of VR?

### Body Ownership Illusion: Stepping into the Shoes of Another

Evidence-based studies in cognitive neuroscience have demonstrated that our body representation is surprisingly flexible. They show that VR is a powerful tool to induce “body ownership illusion” in the case of VR simulations with first-person perspective, especially when this is integrated with multisensory stimuli.

In several experiments at the Karolinska Institute, neuroscientist Henrik Ehrsson and his colleagues have studied how the brain constructs a representation of one's own body through the integration of different sensory modalities. Remarkably, the team found that it was possible to induce in healthy subjects the sensation of possessing dummy limbs, the illusion of having a third arm or even the body of a Barbie doll.<sup>3</sup> The scientists have demonstrated that when individuals visually experience that they are located in a different place from their real body they disown their actual body and no longer perceive it as part of themselves. They have observed that this effect is best induced when the brain has to perform multisensory integration of stimuli: visuotactile,<sup>4</sup> visuomotor,<sup>5</sup> and visuoproprioceptive information.<sup>6</sup> These multisensory illusions have also been achieved in VR experiential set-ups, which show that our brains can easily be tricked into the illusion that an avatar body is in fact our own body.

What is striking is that “such virtual embodiment induces perceptual, attitudinal and behavioral changes on the user's part.”<sup>7</sup> Various evidence-based studies have demonstrated that when

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<sup>3</sup> Guterstam, A., Petkova, V. I., & Ehrsson, H. H. (2011). The illusion of owning a third arm. *PloS one*, 6(2), e17208.

<sup>4</sup> Petkova VI, Khoshnevis M, Ehrsson H.H. “The perspective matters! Multisensory integration in ego-centric reference frames determines full body ownership” (2011) *Front. Psychology* 2:35.

<sup>5</sup> The illusion works best if induced by stimuli relating to the senses of vision and touch (visuotactile), to motor activity involving sight (visuomotor), or to one's perception of the movement of one's body as informed by visual input (visuoproprioceptive). Peck T.C, Seinfeld C, Aglioti SM & Slater, M. (2013). “Putting yourself in the skin of a black avatar reduces implicit racial bias”. *Consciousness and Cognition*, 22(3), 779-787.

<sup>6</sup> Maselli, A., & Slater, M. (2014). Sliding perspectives: dissociating ownership from self-location during full body illusions in virtual reality. *Frontiers in human neuroscience*, 8, 693.

<sup>7</sup> Banakou, D., Groten, R., & Slater, M. (2013). Illusory ownership of a virtual child body causes overestimation of object sizes and implicit attitude changes. *Proceedings of the National Academy of Sciences*, 110(31), 12846-12851.

participants are represented with a virtual body different to their own and identify with it, they exhibit behaviors that correspond closely to attributes of that body. This is what virtual reality researchers Nick Yee and Jeremy Bailenson of Stanford University have called the Proteus Effect,<sup>8</sup> after the Greek mythological god who could adopt countless physical forms.

For instance, when participants identify with a virtual body that has a more attractive face than their real face, their behavior changes: they have the tendency to stand closer to virtual representations of other people. In another virtual scenario, participants adopt a more aggressive negotiating style when embodied in a virtual body that is taller than one that is shorter.<sup>9</sup> Research scientists Domna Banakou and colleagues showed that if subjects were embodied in the virtual body of a toddler, they approximately doubly overestimated the sizes of objects in the virtual environment, and associated child-like attributes to themselves, as measured by the Implicit Association Test (IAT).<sup>10</sup>

### **Changing Bodies Changes Minds**

Imagine a world where we could be free from the limitations of our bodies that contribute to the limitations of our minds. Today VR can help us realize this world. Experiments show that what are commonly assumed to be deep-rooted beliefs or behaviors can be modified through virtual embodiment. This transformative power of VR leverages what cognitive psychologists call “embodied cognition”. In the real world, we live and form ideas about the world surrounding us through a somewhat restricted cognitive lens informed by our body. Research in embodied cognition shows that cognition can be deeply dependent upon features of the physical body. But VR can help us tweak these parameters: it can help us identify with multiple bodies of multiple avatars.

By changing the way we perceive ourselves in the virtual world, we can also change the way we react to people who look different from us in the real world. The work of Mel Slater at University College London and the University of Barcelona has demonstrated that immersive experiences in an avatar that has a different ethnicity from that of the subject could reduce implicit racist biases on the latter’s part.<sup>11</sup> Jeremy Bailenson has taken this approach a step further by introducing a more complex scenario in the experience: not only are you transplanted into the body of an avatar who has a different ethnicity from yourself, but you then suffer discrimination from virtual agents in the 3D world. This VR set-up can give a participant a profound and transformative experience. It enables them not only to experience and condemn racism and discrimination from a purely cognitive and moral perspective, but also from a visceral point of view. VR can actually give flesh, texture and depth of experiential knowledge to the millenary aphorism: “do not do to others what you do not want others to do to you.”

In a separate pioneering VR experiment that Jeremy Bailenson and his team conducted at Stanford’s Virtual Human Interaction Lab participants were endowed with the superpower to fly like Superman and save a child’s life. The results show that participants in the study who had to fly around a virtual

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<sup>8</sup> Yee, N., & Bailenson, J. (2007). The Proteus effect: The effect of transformed self-representation on behavior. *Human communication research*, 33(3), 271-290.

<sup>9</sup> See Yee, N., & Bailenson, J. (2007).

<sup>10</sup> See Banakou, D., Groten, R., & Slater, M. (2013). The IAT measures the relative ease with which people are able to make associations between certain groups of people (such as older or younger adults) and the concepts of “good” and “bad”.

<sup>11</sup> See: <http://publicationslist.org/data/melslater/ref-262/paper4.pdf>.

town to find a missing diabetic child were more likely to engage in prosocial helping behavior in the real world after they had participated in the study than before.<sup>12</sup> Using a standard behavioral measurement framework, researchers observed that participants who took part in the “super-flight” experience were significantly more willing to help the experimenter pick up spilled pens after their virtual experience. The next step would be to conduct a field study to observe if these results translate from the lab to the real world and induce positive lasting behavioral change.

Traditional film media certainly has the ability to inspire. But VR takes this capacity to another level by creating a strong sense of presence in the VR world. It gives you the possibility of actively experiencing an “ordinary” episode of Superman’s daily life and importing some of that superhero mindset into your life in the real world.

## **Generating Empathic Interactions: the Future of Mediation?**

Virtual worlds provide a safe and controlled testing environment to explore conflictual and problematic human interactions. As such, VR is at the frontier of empathy-building and has the potential to generate more empathic ways for human beings to interact with one another.

### **Adaptive and Personalized Empathy Training in Virtual Reality**

Thanks to virtual reality, neuroscientists and experimental psychologists like Philip Jackson have prototyped a responsive, personalized training of empathy in real time. The starting point of their approach is that developing empathy in the course of human interactions is challenging enough in real life, especially because of the multitude of potentially disturbing factors, such as misinterpreted facial expressions, interruptions or external interventions. So, Philip Jackson’s team has developed an experimental lab, using the power of VR, to create safe and secure training spaces to enhance empathic and non-violent communication. This “empathy-enhancing virtual evolving environment” aims at developing empathy with patients suffering from psychopathologies.<sup>13</sup>

The three main components of this VR environment are: (1) avatars expressing feelings and emotions; (2) systems to monitor the neurophysiological and behavioral responses of the participant; and (3) an adaptive system linking the avatar’s behavior to the participant’s neurophysiological response. To use an everyday analogy, think of it as a “gym” for exercising deep and authentic pro-social skills. Such an environment provides an organic ecology of interaction, where the behavioral and neurophysiological monitoring of the participants’ reactions allows control over the virtual social interaction. This amounts to a personalized adaptive training of empathy. Imagine if, before any multi-party mediation, participants could go through training in this “live lab” of empathic social interaction. It could help build their confidence and willingness to engage, as well as prepare them mentally and emotionally for the different scenarios they might face.

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<sup>12</sup> See: <https://vhil.stanford.edu/mm/2013/rosenberg-plos-virtual-superheroes.pdf>.

<sup>13</sup> Jackson, P. L., Michon, P.-E., Geslin, E., Carignan, M., & Beaudoin, D. (2015). EEVEE: the Empathy-Enhancing Virtual Evolving Environment. *Frontiers in Human Neuroscience*, 9, 112.

## Neurofeedback to Teach Empathy

Patrice Renaud, research scientist at the Institut Philippe-Pinel in Montreal, works with sexual delinquents and does with VR what would be difficult, undesirable or impossible to do by other means. He creates a 3D secure space for an interaction between these delinquents and avatars of their past or possible victims. The underlying goal of creating these virtual interactions is to elaborate protocols to foster empathy on the delinquents' part.<sup>14</sup> In a fully immersive Cave Automatic Virtual Environment, Renaud is creating a VR empathy training that uses the technique of neurofeedback and leverages the accuracy of quantitative measurements of brain activity, known as electroencephalography (EEG).<sup>15</sup>

Neurofeedback is a computer-aided training method which allows the brain to see in real time what it is doing at that moment. Selected parameters of the patient's own brain activity, which can normally not be perceived, are made visible to the patient. Think of it as a mirror for the brain. Through this feedback, patients learn to better self-regulate their brain activity. With neurofeedback patients can learn to better compensate for dysregulations of brain activity which correlate with a lack of empathy, and achieve more functionality. Although quite promising, this neurophysiological training raises various ethical questions as to the limitations we should self-impose on the scope of these rehabilitation programs: where does empathy training end and neurophysiological torment begin?

## Virtual Agents for Conflict Resolution and Creative Peacebuilding

VR has also been proven to be a successful tool to build relationships and close the empathy gap between historically opposed ethnic and religious groups. A pioneering study in cyberpsychology was conducted in the context of the Israeli-Palestinian conflict, which involved the following virtual-human interaction set-up.<sup>16</sup> Jewish Israeli participants interacted with a virtual human that represented a Palestinian. When the virtual human mirrored Israelis' posture during a sensitive interaction about the conflict, postural mimicry increased the empathy Israelis felt towards the virtual Palestinian.

This study reminds us that a prelude to empathy is mimicry. Conventional peace-building techniques aspire to create cognitive empathy, or to manage conflict through traditional routes involving confidence-building or analysis of mutual interests. VR shows how these techniques could be supplemented and reinforced through embodied cognition. If we represent outgroups as virtual humans that mimic our own movements, we can blur the line between ingroups and outgroups. The experimental study outlines a promising future where VR could help us upgrade our own mental software in an innovative way, and eventually contribute to an improvement in relations between groups involved in long-lasting conflict. It would be trail-blazing if, as the study suggests, VR could even help to ameliorate a conflict which has come to represent a stain on the international community's collective moral consciousness.

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<sup>14</sup> Joyal, C. C., Jacob, L., Cigna, M. H., Guay, J. P., & Renaud, P. (2014). Virtual faces expressing emotions: an initial concomitant and construct validity study. *Front Hum Neurosci*, 8, 787.

<sup>15</sup> Research in the making. Papers to be published. (Skype interview from February, 9, 2016).

<sup>16</sup> Hasler, B. S., Hirschberger, G., Shani-Sherman, T., & Friedman, D. A. (2014). Virtual peacemakers: mimicry increases empathy in simulated contact with virtual outgroup members. *Cyberpsychology, Behavior, and Social Networking*, 17(12), 766-771.



## Conclusion – The Symbiosis of Tech, Science and Art

These first scientific experimentations open up unparalleled opportunities to drive positive behavioral change through first-person perspective transformative experiences. They facilitate and promote the development of empathic interactions between individuals and between groups. As the cost of VR hardware is decreasing, access to this technology will expand. The potential of VR as a driver for behavioral transformation, empathy building and conflict resolution is only likely to increase.

Art also has a role to play in the development of tech-enhanced peacebuilding techniques, as its insightful intuitions corroborate the scientific method based on hypothesis testing. For instance, the VR installation called *The Enemy* uses VR to make enemies visible to each other and by virtual means bring them into the same room, often a challenging first step for mediators. There is a potential space in between art, science, technology and peacemaking in which new creative forms of conflict resolution can be developed and tested by interdisciplinary teams. This article calls for that space to be cultivated and seeded with new initiatives.

Of course, as always with technology, we should remind ourselves that it can be used for good or ill. Just as technology can be used for peacemaking, it can be used for manipulation or aggression. It is for us to decide how to use this unique and powerful tool. We should be ready to embrace the ethical responsibility that is attached to VR, in proportion to its immense power. VR still lacks and is in need of a Hippocratic oath. Focusing on collaboration which seeks to use VR for the greater good, such as to enhance peacebuilding, could encourage industry actors, developers and a range of stakeholders to take further action towards outlining the principles of this oath.

Defense, security and war related imperatives have historically pushed the boundaries of technological advancement, as we are reminded on a daily basis through technologies such as the Global Positioning System or the jet engine. Hopefully, in a not so distant future, as Dr. Martin Luther King, Jr. framed it, we will be able to “bridge the gulf between our scientific progress and our moral progress.”<sup>17</sup> Conflict resolution, empathy building and creative peacebuilding should drive the future of technological innovation.

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<sup>17</sup> “One of the great problems of mankind is that we suffer from a poverty of the spirit which stands in glaring contrast to our scientific and technological abundance.” (Dr. Martin Luther King, Jr., 1967, “The World House”.)