VR and Empathy: The Bad, the Good, and the Paradoxical

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VR and Empathy: The Bad, the Good, and the Paradoxical

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ABSTRACT

Virtual reality (VR) is cited as offering the ultimate empathy machine [31]. This theory makes sense intuitively since VR enables a user to step in to another's shoes and experience the world as they do. We define this specific class of mental state as 'emotional empathy' [49].

The ability of VR to evoke emotional empathy is widely lauded as a good thing [18, 35, 43]. In this paper we invite labels such as 'Luddites' and 'technophobes' as we question the soundness of such claims. We instead offer warnings regarding employing VR is this manner and urge caution. Rather than dismiss the usefulness of VR in this realm we offer alternative implementation techniques in order to evoke more positive results in users.

VR offers much utility for psychologists, psychiatrists, and neuroscientists due to the ability it affords to alter cognition. While promoting the medium in general, we offer warnings regarding potential short and long term neurological impacts. We encourage increased research focus on the underlying neural mechanisms that underpin VR's successful multisensory hijack.

Index Terms: Human-centered computing—Human computer interaction (HCI)—Interaction paradigms—Virtual reality; Applied computing—Law, social and behavioral sciences—Psychology

1 INTRODUCTION

Virtual reality based interventions offer much promise in many aspects of medicine [44]. The ability to change perception using highly immersive virtual environments (VE) and simulations make VR a very attractive tool for brain scientists, psychologists, and psychiatric health professionals [6]. Compatibility with imaging technologies such as functional magnetic resonance imaging (fMRI) enables researchers to present multimodal stimuli with a high degree of ecological validity and control, while simultaneously recording changes in brain activity [6].

This flexibility of VR as a tool has already encouraged many applications including therapeutic use for PTSD [14], phantom limb pain [34], autism [21], and body dysmorphia [37]. Many applications show promising results. While we witness an abundance of such research exploring applications for improved mental health, few concern themselves with possible negative short and long term psychological and neurological impacts.

While the tag of 'Luddite' may partially suit, it is in our absolute faith that VR can be used in highly effective ways which motivates this discussion. Unlike many other emerging technologies that have come and gone, (spawning similar bandwagons on their way), VR actually deserves the hype. It is this power as a tool for good which makes VR deserving of special attention and deeper investigation as to possible pitfalls.

Chris Milk's claim that "virtual reality can create the ultimate empathy machine" [31] concerns us most. We look to explore the validity of such a claim while questioning whether this is a good or bad thing independent of the validity.

1.1 Defining Empathy

The kind of empathy which we focus on here is that of *emotional empathy*.

> "We place ourselves in his situation entering into his body (so to speak) and becoming in a way the same person as he is. In this manner we form some idea of his sensations, and even feel something that somewhat resembles them, though it is less intense."
>
> Adam Smith (1759)

We distinguish this kind of empathy from that of 'cognitive empathy' which is more neutral and detached in nature [30] and relates closely to what we more readily label social intelligence.

2 THE BAD

Until recently it was generally accepted that emotional empathy was a good thing from a moral point of view [39]. More recently we've seen prominent psychologists and neuroscientists offering arguments directly opposing that established viewpoint [4, 23, 38]. Reasons for this shift in perspective come in various forms but generally break down into two subcategories which we may define as either *'the spotlight effect'* or *'the natural bias effect'*.

The spotlight effect relates to the limited bandwidth inherent in emotional empathy. We favor the individual, over the many, even when the plight of the many is far more serious [48]. This concern for the individual is further enhanced if they're similar to us, or we find them attractive in some way. Both similarity (ingroup vs. outgroup), and attractiveness are two examples of *the natural bias effect* [13, 16].

This misdirected moral compass which belittles outgroup members' suffering while emphasizing that of ingroup members [11] can lead to a dark side of emotional empathy rarely considered. In directing our emotional spotlight towards a victim belonging to our ingroup, we crave a harsher punishment for the perpetrator(s) when we our levels of emotional empathy are highest [50]. This same heightened sense of emotional empathy turns out to be one of the best predictors of aggression on a victim's behalf [8]. Should VR provide such powerful empathic responses of this nature it leads us to concerns regarding two kinds of developer. Firstly, we must consider the naive developer whose intentions are benign yet their simulations inadvertently lead users to morally questionable conclusions. Secondly, and perhaps more worrying still, is the nefarious developer who designs simulations to exactly utilize those pitfalls described.

Emotional empathy within intimate relationships cannot be questioned in moral terms but we see further evidence of its impracticality. Excessive sharing of others' negative emotions and pain can be a primary cause of burnout, empathic distress, and decreased helping behavior [25]. The value of kind, reassuring words from a caring doctor towards their patient is well documented [22]. However, those who truly empathize too regularly increase the potential for 'burnout' and risk a premature end to their medical careers [26, 28, 32, 36]. Whether such empathic burnout leads to professional or personal issues of indifference and disinterest we must caution against exhausting our finite capacity for such emotion [2, 12].

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Such problems come as part of the emotional empathy package. Should VR simulations provide the empathic response as described by Milk [31] we must be mindful of these side-effects and think carefully about universally promoting such experiences.

3 The Good

Processing power and innovations in interactive technologies make fully immersive VR experiences ever more probable. Increasing a user's immersion in turn increases the potential for the perception of presence within a VE [20]. When maximized a user can enjoy extremely rich experiences capable of causing lasting cognitive improvements given the right stimulus [17, 40]. We have previously mentioned some of those conditions that have been targeted by researchers, (PTSD, phantom limb pain, autism, body dysmorphia), but the list of mental health disorders likely to be helped with VR goes on and on.

While we should be concerned regarding the use of VR to evoke emotional empathy, we propose employing the medium in a healthier way for the related empathic response of rational compassion. We define compassion as the feeling of concern for the suffering of others associated with the motivation to help [3]. Compassion relies on different biological systems and brain networks and can help foster resilience rather than burnout. This emotion energizes rather than fatigues [24, 46, 47] the individual making it infinitely more practical both in the short and long term.

Equipped with VR we may resist those kinds of simulations which evoke emotional empathy, and instead design simulations which encourage this other form instead. Rather than users stepping into the shoes of those suffering emotionally disturbing situations, such as the Syrian refugees stuck on a beach and reliving their perilous journey as with the BBC's 'We Wait' [1], a user may instead enter a VE set up to offer *'metta'*, or loving-kindness meditation. Such contemplative practices train the mind to be calm and focused, and in turn, encourage a 'reset' in thinking away from emotional empathy and toward rational compassion.

Figure 1: BBC Taster – We Wait VR [1]: Immersive VR news content is already here.

The flexibility of VR allows us to simulate any number of useful simulations which can help in this regard. We may design an idyllic VE in which a user may choose their perfect virtual meditation yogi to guide their mediation practice. In the case of *metta* we may encourage a user to upload relevant pictures of those they care for, feel indifferent towards, and dislike. As they develop through their practice, the avatar before them will switch from someone they love initially, to finally someone they very much do not. This gradual progress while repeating the prescribed phrases of well wishes can enable the kind of positive change in perception intended from the use of emotional empathy simulations without the negative side effects previously described [19, 53].

A realization of the flaws relating to emotional empathy are exactly those which have galvanized the 'effective altruism' movement [29, 45]. Virtual simulations based upon the ethos offer additional adaptation potential away from tiring emotional empathy, towards something rather more pragmatic.

4 The Paradoxical

There exists little concrete research to back up the assumption that VR is indeed an ideal emotional empathy activator. "We Wait" [1] transports you to the heart of the refugee crisis. It is the first in a line of BBC productions of this kind which shall challenge journalists and consumers alike. The Virtual Human Interaction Lab at Stanford University has its own empathy-based simulation. This time the user is 'thrust into the world of the homeless' in a twelve-minute homelessness experience taking the user through eviction, the selection of personal items to sell, being kicked off a bus, and an encounter with mean spirited police officers [51].

Both simulations are designed with an intention to evoke large emotional empathy reactions in users and illustrate the horror of the situations first hand. At first glance these simulations fit exactly the description of those that we concern us most. Paradoxically, they may in fact offer some hope that our worries are in fact unfounded. Twelve minutes of 'being' homeless or a refugee is hardly taking the user into the physical and psychological depths of a given situation. Such failure in generating the desired response may be a relief to us concerned with empathic burnout but in turn additionally risks trivializing the situation instead [5].

Others looking into Milk's claim [31] share similar skepticism regarding the emotional empathy evocation intended [7, 15]. We are left with a slightly paradoxical situation in which, should VR actually end up evoking the empathic responses intended, we would necessarily be concerned and possibly declare ourselves 'against empathic VR'. Conversely, if the simulations fall below the effects intended, we may instead be trivially 'for empathic VR' with the caveat that such simulations may in fact do more harm than good.

Although, slightly ridiculous, we include such a statement in order to emphasize the impoverished nature of our current knowledge. Yale's Paul Bloom perhaps says it best.

> "I just don't know what that does to the human mind and human ethical norms over the course of decades and beyond. It just seems like a giant roll of the dice psychologically."
>
> Paul Bloom (2016)

5 Conclusion

The 'one killer app' which finally provides the tipping point for mass VR adoption looms large. It is our responsibility to investigate the neural consequences of VR immersion in order to help guide development of the medium. VR offers powerful, novel, therapeutic solutions to mental health practitioners, and equally powerful simulations to consumers. Such power generally comes with a cost attached [9]. While uncertainty remains regarding the effects on the human brain we must tread carefully.

In order to draw definite conclusions regarding Milk's claim [31] much work needs to be completed. Several important questions remain unanswered making a truly informed evaluation regarding the validity of his statement impossible.

5.1 Does virtual reality evoke neural activity consistent with real world activation?

VR may indeed be different to all forms of media that have gone before, but we cannot presume that neural activation from empathy evoking virtual stimuli mimics that of real world stimuli. We propose comparing neural activation, from real and virtual empathy evoking scenarios, in the superior temporal sulcus (STS), Brodmann area

40 (BA40), and premotor cortex (F5) using functional magnetic resonance imaging (fMRI).

5.2 Can virtual reality lead to empathic burnout or desensitization?

We propose employing virtual reality in a longitudinal study in order to evoke regular empathic reactions over an extended period. Should neural activation from VR indeed mimic that of real world activation, we would look for changes in activation over time especially in F5.

Recent evidence seems to show conclusively that mirror neurons do indeed exist in humans [41, 42]. Our motor system [16] and somatosensory cortex [10, 27, 33] become active as if we were executing the same action, or experiencing the same pain, that we are observing. As Ramachandran explains, "if I really and truly empathize with your pain, I need to experience it myself. That's what the mirror neurons are doing, allowing me to empathize with your pain – saying, in effect, that person is experiencing the same agony and excruciating pain as you would if somebody were to poke you with a needle directly. That's the basis of all empathy." [52]

VR's compatibility with fMRI allows us to present multimodal stimuli with a high degree of ecological validity and control which we record changes in brain activity [6]. We suggest beginning by focusing on the areas of the brain described. In this way, we begin to examine whether neural patterns previously evoked using real world empathic stimuli are reproducible using the corresponding VR simulation.

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