

Eddie Cai CUROP 1-page abstract 1.7

I originally intended to study virtual reality's (VR) ability to produce realistic, interactive environments for subjects to engage with, but ended up investigating VR's potential effects on the subjects themselves. I was provoked in this direction by the claim that we could become embodied in completely novel bodies within VR, like lobsters or trees. Thus, my research aimed at investigating the plasticity of embodiment—understood as the feeling of body-ownership (BO)—and its relation to VR. The feeling of BO is the feeling that one's body belongs to oneself, and its plasticity refers to the degree to which we can confuse external objects with our own bodies. This phenomenon seems strange because we normally never confuse what counts as 'me' and what is 'not-me'. However, BO and its flexibility has been studied extensively by scientists through experiments using body-ownership illusions (BOIs), which can be successfully elicited in healthy subjects with extreme ease and reliability. Importantly, many of these experiments explicitly depend on the VR apparatus for the production of the illusion. And given the nature of these illusions, VR is the only medium in which these illusions can be exploited.

The two main kinds of BOIs used are rubber-hand illusions (RHIs) and full-body-ownership illusions (FBOIs). In RHIs, through the use of tactile stimulation and the hiding of the real hand from one's visual field, subjects are made to confuse an artificial rubber hand for their real hand. Subjects feel as though the rubber hand is literally their real hand, and that their tactile perceptions are being caused by the rubber hand being touched. FBOIs are induced via similar methods. Here, subjects confuse an artificial/simulated full-body as their own body. These illusions work in spite of discrepancies between the appearance of the object and the subject's own body: a male subject can confuse a woman's body for his own. The objects can even be virtual/simulated. Moreover, a variety of measurements are taken of subjects' unconscious bodily processes, providing both subjective and objective evidence to support the idea that people can literally confuse what counts as their own body.

However, the illusions do not work for all kinds of objects. For example, the FBOI fails when a rectangular object is substituted for an artificial body. Explaining these limitations determines the flexibility of embodiment. I defend one theory that does so by way of appealing to the functional utility of an object and its relation to a certain portion of the body; an object's appearance is irrelevant. I also argue that this theory requires that subjects be agents in the world in order for these illusions to work, thereby providing empirical support to undermine unfounded dystopic predictions of the implications of developing VR technology.

These illusions require the source of perceptual stimulation to be in direct contact with the subject; the VR apparatus is the only medium with the same requirement (headsets, gloves, etc.). The VR apparatus is therefore uniquely suited for the task of reproducing these illusions; that the majority of experiments use VR to elicit the illusion is further support for this claim. Thus, no other medium can compete with VR's capacity to produce feelings of immersion: it allows subjects to literally feel as though another body were their own. This capacity of VR has a variety of applications. In the scientific field, the flexibility of BO could not be studied without VR's creative ability to produce simulated bodies; and these results are rich with philosophical potential for theorists interested in the formation of self-consciousness. Work is also being done to apply this power of VR to therapeutic contexts by treating mental illnesses that involve self-perception. Furthermore, the entertainment industry sees great potential in VR's unparalleled power to produce BOIs—a point that must be considered by any theorist evaluating VR as an artistic medium. Overall, VR's relation to these psychological illusions is something that very few theorists, from any field, can afford to overlook.

