
Last but not least

A simple method to stand outside oneself

Abstract. Here we outline a simple method of using two mirrors which allows one to stand outside oneself. This method demonstrates that registration of vision with touch and proprioception is crucial for the perception of the corporeal self. Our method may also allow the disassociation of taste from touch, proprioception, and movement.

We have previously demonstrated that patients with immobile phantom limbs are often able to move the phantom by trying to move the phantom while simultaneously moving the intact limb and watching the *reflection* of the intact limb in a parasagittal mirror (Ramachandran and Rogers-Ramachandran 1996; Ramachandran et al 1995) (which then looks like the phantom limb ‘resurrected’). Case reports and small series from ourselves and others suggest that using this mirror procedure may be beneficial for patients with a number of diseases (Altschuler and Hu 2006; Altschuler et al 1999; Giroux and Sirigu 2003; Hunter et al 2003; Maclachlan et al 2004; Rosén and Lundborg 2005; Sathian et al 2000; Stevens and Stoykov 2003, 2004). A full understanding of this mirror effect is still being developed, but recent psychophysical studies in normal subjects (Franz and Packman 2004; Gallace and Spence 2005; Holmes and Spence 2005; Holmes et al 2004, 2006) strongly support the notion that the mirror effect works by using vision of the intact or good arm to replace or drive proprioception in the affected hand or arm. Normal subjects can readily experience the ‘odd’ feeling of the discrepancy of vision and proprioception by opening and closing their fists of both hands at slightly different speeds or with a small phase offset while watching the reflection of one of the hands in a parasagittal mirror. Here we note a related, but novel effect in which by using two mirrors one can stand outside of oneself.

The arrangement of mirrors is illustrated in figure 1a and the procedure for standing outside oneself in figure 1b. The third image from the left in figure 1b is the crucial one. This is the reflection from the back wall mirror of the reflection from the front rolling mirror (with wooden frame) of an individual stroking his cheek with the index finger. As opposed to the second and fourth images from the left in figure 1b, in this third image the subject is able to see only part of his cheek, and in particular is not able to see his eyes. Upon stroking our faces with our index fingers while watching this view both of us obtained an ‘eerie’ feeling that we were touching not ourselves but some kind of ‘alien’ or android in a body outside (but similar) to our own. When we asked ten colleagues to perform the same procedure all noted that looking at this view also evoked the feeling that it was not their own cheeks being stroked, and that they were able to stand outside their bodies and observe themselves. A couple of people noted that they wanted to say “hello” or meet the individual whose cheek was being stroked. One person, who happened to be chewing gum, noted that the third image was chewing, but didn’t seem to be tasting anything.

We find it interesting that a simple lack of registration of touch and proprioception on the one hand, and vision—the inability to see one’s entire face—on the other hand, allows one to so easily stand outside one’s corporeal self. Our procedure may also allow the disassociation of taste from touch, proprioception, and movement. Further study of such a disassociation is warranted. Imaging results (Fink et al 1999) have found that the bilateral dorsal lateral prefrontal cortex is crucial for detecting the mirror-induced discrepancy between vision and proprioception of a hand, and this or other areas may alert one to the whole body discrepancy we describe here.



(a)



(b)

Figure 1. Method to stand outside oneself: (a) arrangement of the mirrors, (b) procedure. The first image on the left in the figure is the subject himself. The second image from the left is the image of the subject in the rolling mirror (with wooden frame) on the subject's left. The third image is the image on the back wall (right side of subject) mirror of the image in the rolling mirror. The final image is the reflection of the third image, again in the rolling mirror.

For example, recently, Blanke and colleagues (Arzy et al 2006) have found that stimulation of the temporal parietal junction evokes the feeling that another person is standing behind one. Most people experience odd feelings upon watching movies or videos of themselves. However, while there is emotional and cognitive identification with that person on screen, because of a lack of simultaneous action with the recorded action, there is not the same ability to stand outside one's body as in the double-mirror effect. Indeed, in the rubber-hand illusion (Botvinick and Cohen 1998) simultaneity of stroking of the individual's hand under a table and a rubber hand on top of the table is crucial to evoke the perception that the rubber hand is in fact the person's hand. We hope that the effect we describe here may be useful in understanding perception of self and possibly some aspects of consciousness in healthy and diseased states.

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