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Introduction

This presentation draws on my research in to technological embodiment as part of my PhD studies, which explores a phenomenon called the 'digital double' - a manipulable representation of the human body in a variety of performance and new media contexts. My research uses lived experience and autoethnographic writing as a methodology to document and reveal embodied knowledge of the interfaces of body, technology and self when technologically embodied through the digital double.

This presentation will give an overview of my research alongside discussion of *Me and My Shadow* (2012), an interactive telematic and live motion-capture performance installation by sound and media artist Joseph Hyde. Using extracts from autoethnographic writing about my embodied experience of the installation as an audience member, I will illustrate the theoretical and embodied bases of my research. My intention is to highlight flaws in current theorisations of the digital double and technological embodiment in this context, which stem from reliance on Merleau-Pontian philosophy of the body as the basis for the research area, and its inherent 'somatophobia' (Barbour, 2005). I will argue that, through an embodied research methodology and consideration of somatic philosophy and dance scholarship, a more holistic understanding of technological embodiment can be reached.

Autoethnography

My methodology draws on the work of Carolyn Ellis, Tony Adams and Arthur Bochner (2011) on autoethnography, and Karen Barbour (2009) on narrative and embodied ways of knowing. In 'Autoethnography: An Overview' Ellis, Adams and Bochner define autoethnography as, quote '...an approach to research and writing that seeks to describe and systematically analyze (*graphy*) personal experience (*auto*) in order to understand cultural experience (*ethno*) (Ellis, 2004; Holman Jones, 2005).' (Ellis, Adams and Bochner, 2011: 1) End quote. My research analyses my personal experiences of technological embodiment in a range of new media contexts - including performance installations, console gaming and online metaverses - in order to understand cultural experiences of technological embodiment. In using autoethnography as a research methodology, my research is quote '[s]elf-consciously value-centered rather than pretending to be value free (Bochner, 1994).' (Ellis, Adams and Bochner, 2011: 2) End quote. I acknowledge the presence of myself as a researcher in my research, and recognise the ways in which my self and my experiences influence the research process. This includes what Ellis, Adams and Bochner call my 'assumptions about the world' (Ellis, Adams and Bochner, 2011: 2). In the case of this particular research project, I am interested in my position as a dance scholar and practitioner, including ongoing engagement with somatic practices. As such, I bring to my research a number of experiences and assumptions about the body and my philosophical and experiential understandings of self. This includes a heightened level of somatic awareness. Rather than consider these a barrier to knowledge creation, I recognise all knowledge as constructed, as in the postmodern tradition. As dance knowledge and scholarship is under represented in new media philosophy, philosophy of technology and digital performance discourses on the body, technology and self, I consider these 'assumptions' to be integral to creating new knowledge in this research area.

This approach also recognises Barbour's argument that a methodology for researching embodiment should itself be embodied. (Barbour, 2009: 47) As such I document my experiences of technological embodiment as field notes, which I later construct in to written narratives of my lived experiences. Here, '[w]riting [i]s a way of knowing, a method of inquiry (Richardson, 2000).' (Ellis, Adams and Bochner, 2011: 5) Through writing, to quote Barbour, I allow my 'theoretical and embodied understandings' of technological embodiment 'to be revealed through rich narratives of lived movement experience.' (Barbour, 2009: 87) End quote.

As such, this presentation is structured around a series of extracts from my autoethnographic account of the work *Me and My Shadow*. These have been foregrounded structurally to demonstrate the significance of my embodied experience of this, and other works in knowledge making, theorisation and philosophical debate.

Digital Double

Me and My Shadow is an installation in four cities; London, Paris, Istanbul and Brussels. Each installation acts as an online portal, connected in real time to a 3D virtual environment where participants meet both their own representations, and participants in other cities. The piece combines motion-capture and telepresence technologies. Multiple Microsoft Kinects are used in each site to capture the movement of participants, which is then projected on to an avatar or 'shadow' in the virtual world. The avatar is featureless; merely an outline of body shape. The only way to distinguish avatars is by colour; each of the portals is represented by a different colour avatar, so that you know where your dance partner is coming to you from. London based participants have purple avatars, Paris red, Istanbul blue and Brussels green. The London base for the installation is the National Theatre foyer, and is open to the public from 10th-26th June 2012. By the time I arrive at the London portal, due to delayed trains and tubes I am flustered and running late.

The digital double is a representation of the human body in the digital world, the most common of which is defined by digital performance scholar Steve Dixon as the 'digital double as manipulable mannequin' (Dixon, 2004: 25). As with the computer avatar, the digital double as manipulable mannequin functions as a 'graphical stand-in' for the human body in the digital world (Dixon, 2007: 269). This graphical stand-in could, for instance, be a filmed projection of your body in a remote location, a humanoid avatar in a virtual world or game environment controlled via console controller or motion capture, or a non-humanoid image projected on to a gauze in a stage space. The digital double as manipulable mannequin is not characterized as such because it looks like us, but because it is our means of acting and communicating in remote or virtual locations.

Although characterized by Dixon as a stand-in, the digital double is not experienced as a *substitute* for the body, but rather as an *extension* of the body. This has been argued by digital performance theorists such as Susan Kozel (1994, 2004), Gabriella Giannachi, (2004), Jacqueline Ford Morie (2007), Sita Popat and Scott Palmer (2008), Popat (2012) and Popat and myself (2012) in reference to a range of digital doubles. The digital double illustrates a particular kind of technological embodiment.

Philosophical Basis for the Digital Double

Learning to move isn't quite as straight forward as I expect it to be; mainly because movement of the upper body changes the direction. The comment book I am directed to as I leave the installation calls it 'getting lost standing still'. Every time I move my shoulders my avatar races off in to the virtual space, and I feel like I am running after them, asking them to come back. Once, when I get lost, I cannot find my way back. The space is featureless - nothing but a gray expanse of land, a blank expanse of sky and the moon. The moon quickly becomes my point of orientation, and when it eludes me I begin to panic. I can feel my heart racing and my breath constricting; it feels like getting lost in the woods as a child and thinking I'm never going to get back home. But, gradually, as I learn to keep my shoulders still I find my way back, and when I see the moon again I reach up to it, relieved.

In his treatise on the body in digital environments, *Bodies in Code* (2006), new media philosopher Mark Hansen proposes a mixed reality paradigm where 'all reality is mixed reality', and the physical and digital worlds are fused rather than separate 'realms' (2006: 1, 5). Drawing on the work of phenomenologist Maurice Merleau-Ponty (2009), Hansen proposes that in mixed reality the body retains its ontological role in giving birth to the world, and that the physical and digital worlds are both accessed through embodied perception (Hansen, 2006: 5). As such, Hansen proposes that, and I quote '...human embodiment no longer coincides with the boundaries of the human body...', end quote, and our embodiment in mixed reality is constituted both physically and digitally (2006: 95). In mixed reality humans are (re)embodied through technics (ibid.). The digital double is an example of Hansen's mixed reality embodiment where the body, extended to include the digital double, is constituted both physically and digitally.

Hansen's work provides an overall philosophy of the body and technology, whilst philosopher of technology Philip Brey talks more specifically about technological bodily extension. Brey maintains that what he calls 'embodiment relations' with technology occur when we enter into a symbiotic relationship with a technological artefact; when it amplifies our perceptual abilities, or extends our ability to act in the world (2000: 15). These two types of embodied relations relate to two phenomenological similes of bodily extension, Martin Heidegger's hammer and Merleau-Ponty's blind man's stick, which proliferate in studies of technological embodiment. The simile of Heidegger's hammer in *Being and Time* (1927, 2005) proposes that the carpenter has such a subtle dexterity in his use of the hammer that it is incorporated into his bodily functioning (Heidegger, 2005: 9). The hammer extends the carpenter's ability to act in the world, and therefore withdraws from his explicit attention (Heidegger, 2005: 9). Merleau-Ponty makes a similar argument about the blind man's stick, which, as an extension of the blind man's means of perceiving the world, I quote, 'has ceased to be an object for him, and is no longer perceived for itself' (Merleau-Ponty, 2009: 165). End quote. The hammer and the blind man's stick are no longer experienced as objects of perception, because they are, to quote Brey, that

‘through which the world is experienced and engaged.’ (Brey, 2000: 15) End quote. As such, they become a part of our extended bodily experience and we experience technological embodiment.

In ‘Pluralistic Presence: Practising Embodiment with my Avatar’ (2012), Popat and I argue that the digital double is a technological artefact that extends our ability to act in the world; a digital version of Heidegger’s hammer (2012: 167-8). As such, the digital double disappears from our perceptual field as an object of perception to become part of our extended bodily experience. Popat and I propose that embodied agency, and, I quote, ‘[f]eedback loops that link intention-action-proprioceptive feedback’, end quote, are critical to the achievement of bodily extension through the digital double (Popat and Preece, 2012: 164). Here, feedback from the digital double’s movements must correspond to our motor intention to establish an extended ability to act in the world.

The struggle illustrated in this extract is indicative of the importance of embodied agency to technological embodiment. When my digital double’s movement doesn’t match my intention it becomes an object of my perception, indicated by the references to ‘my avatar’ rather than ‘I’. I refer to the digital double as ‘I’ when they are performing my intended action, reaching up to the moon, as the digital double is extending my ability to act in the world and body is therefore constituted physically and digitally. I refer to the digital double as ‘my avatar’ when there is a severance between action and intention, when my avatar races off in to the virtual space.

For conceptual clarity, the approach to self in my research is grounded in Antonio Damasio’s theorisation of the self outlined in his book *The Feeling of What Happens* (2000).¹ Damasio bases his approach on the self as it is present in experience, deducing that our conscious experience gives rise to two types of self; the core self, the self as our moment to moment embodied perspective on the world (2000: 148) and the autobiographical self, the self as extended through time through autobiographical memory and self perceptions (2000: 16).²

¹ I am using Damasio’s work as the basis for my research in to the self for theoretical and embodied reasons. Damasio’s work on the self is drawn from precedents in classical phenomenology; in particular, Merleau-Ponty’s proposal that our being-in-the-world has the dimensions of embodiment and temporality (Merleau-Ponty, 2009: 98) It is also part of the neurophilosophical project - the use of neuroscientific theories to address broader philosophical issues (Gallagher, 2007). I am interested in neurophilosophy and cognitive philosophy as disciplines that develop phenomenological reasoning and research, alongside the development of somatic philosophy. From an embodied perspective, I uses Damasio’s work as a theoretical basis of my approach to self as it mirrors my embodied experience of self in both physical and digital contexts.

² My research methods are intended to address these conceptions of self - researching through lived experience (core self) and autoethnographic writing (as a manifestation of the autobiographical self). With Barbour, I consider writing to be a way of knowing (Barbour, 2009: 55), and autoethnographic writing to be an experience of self, and a way of articulating and accessing self-knowledge.

Somatic Philosophy and the Self

My avatar doesn't move in disjointed steps as I do, but glides through the virtual world, aided by the fact that the bottom half of my legs aren't picked up by the Kinect. It's a bit like skiing; I have the feeling like I'm gliding, due to the smoothness of the movement. I soon become engrossed in the correspondence between how my movement feels, and how it looks. As a dancer, I frequently use a mirror as a means to correlate kinaesthetic and visual information about my movement. The use of the mirror in this context is as a corrective tool, to confirm that my kinaesthetic and proprioceptive perceptions of my bodily position and movement are accurate. Working as a dancer for film and projection, I am also used to seeing myself dancing on film, a process that facilitates the judging of technical flaws in my movement. The relationship I have to seeing the movement of my avatar is somewhat different, because it doesn't have my face, or distinct bodily features. Without being able to focus on my bodily features and the technical accuracy of movement as it lacks the level of detail, I begin to see the quality of my movement more clearly than I ever do in a mirror: and I am struck by its fluidity. For the first time, the visual image of my movement seems to correlate to the feeling of moving when I am improvising. I begin to play with maintaining a visual and kinaesthetic sense of fluidity in my movement whilst increasing its swiftness. I am no longer lamenting the absence of a remote partner to dance with, because I am engrossed in a dialogue with my own movement.

The research context of the relationship between the body, technology and self owes a conceptual debt to phenomenology, specifically to Merleau-Ponty's *Phenomenology of Perception*. Indeed this is unsurprising when we consider Merleau-Ponty's status as, to quote Richard Shusterman 'something like the patron saint of the body' in Western philosophy (Shusterman, 2005: 151). End quote. However, Merleau-Ponty's phenomenology of the body is criticised as incomplete by somatic philosophers, Shusterman (2005) in particular, for ignoring somatic sensations. Due to the prioritisation of phenomenological, particularly Merleau-Pontian, approaches to the body, somatic sensation is similarly absent from the research context of the digital double and technological embodiment.

Merleau-Ponty maintains that explicit attention to the body and somatic sensation distracts us from the world, and thus limits our ability to act in it (Merleau-Ponty, 2009: 104-5). Kinaesthesia and proprioception, for example, are not part of our conscious awareness but form a tacit background to our everyday life (Merleau-Ponty, 2009: 164). Phenomenologist Drew Leder calls this acting *from* the body *to* the world, where our attention is focused on the world, and thus the body recedes from conscious awareness (Leder, 1990: 14). Shusterman challenges Merleau-Ponty's approach to somatic sensation by arguing that somatic disciplines (such as yoga, meditation, and I would argue dance practices such as improvisation) cultivate a heightened level of somatic awareness, where we can become consciously and explicitly aware of somatic sensations (2005: 165). As such, Shusterman argues that kinaesthetic and proprioceptive perceptual judgments can be brought into

awareness through attending to somatic sensation (Shusterman, 2005: 158). He proposes that through somatic awareness we become aware of ourselves as a subjectivity (2005: 158). We are explicitly aware of our somatic sensations, and our ownership of them.

Merleau-Ponty and Leder's work has been used by Popat and myself to argue that the digital double recedes from awareness as we act *from* our body *and* the digital double *to* the world (2012: 169). This is particularly true when the body is represented in a remote location by a digital double 'that acts as a conduit for communication', such as in telematic performance (Popat and Preece, 2012: 160). The focus here is on acting in the world, more specifically interacting with a remote other, rather than perceiving or attending to the (here, technologically extended) body. However I would argue that there are instances when our attention is focused not on the world, but on bodily experience which is not discussed.

In my experience of visiting *Me and My Shadow*, there were lengthy periods in which there was no-one in the other 3 locations. At these points, my attention was very much on my bodily experience and the 'unfolding kinetic dynamic' of my movement, what Maxine Sheets-Johnstone calls kinesthetic consciousness (1999: 142). My autoethnographic writing reveals an awareness of the 'unfolding kinetic dynamic' of my movement - in this extract, the feelings of gliding, smoothness, fluidity and swiftness.

In *The Primacy of Movement* (1999), Sheets-Johnstone observes that 'kinesthetic experiences are not equivalent to experiences of a mere change in position, any more than movement itself is a mere change of position.' (Sheets-Johnstone, 1999: 142) Sheets-Johnstone makes the distinction between kinaesthesia as a source of perceptual information about changes of bodily position in movement, and kinaesthetic consciousness, a heightened level of somatic awareness. (1999: 142) Through kinaesthetic consciousness we are aware of somatic sensations when moving, and the four primary qualitative structures of movement; force, effort, space and time (Sheets-Johnstone, 1999: 151, 143). We are able to distinguish between kinetic bodily feelings such as the smoothness or sharpness of movement. In this extract, aspects of force and effort are beginning to be articulated.

Sheets-Johnstone argues that by focusing our attention on our bodily experience rather than perceiving the world, kinaesthetic consciousness awakens our experience of ourselves as a subjectivity (Sheets-Johnstone, 1999: 138). In articulating levels of somatic awareness, Shusterman similarly concludes that explicit perception of somatic sensation is inherently self-conscious. His example is that we are aware not only that we are short of breath, but how we are breathing (rapidly and shallowly through the throat, for example) (Shusterman, 2005: 158) In my autoethnographic account of *Me and My Shadow*, I was not just aware *that* I was moving but *how* I was moving. This is the moment-to-moment awareness of ourselves as a subjectivity that Damasio refers to as the core self in the attribution of agency (I am the one moving) and sensation (how I am moving, here the feeling of gliding) to my self. We can achieve further clarity through discussion of the implicit movement qualities inherent in the comparison to skiing. As a (novice) skier, I enjoy skiing as the movement quality has a sense of smoothness, strength and control. Similarly, although 'gliding', may seem relatively superficial as a description of movement quality, it is

loaded with meaning drawn from knowledge and experience of Laban Movement Analysis and the Laban Efforts, where gliding is sustained, light and direct (reference?). Bound up within my autoethnographic account of this experience are aspects of my autobiographical self - defined by Damasio as my lived past, anticipated future, behaviours and self-perceptions (Damasio, 2000). This includes my experiences of skiing and knowledge and experience of the Laban Efforts, as well as the feeling of being lost in the woods referred to earlier. These are some of my 'assumptions about the world' that structure my experiences and my research (Ellis, Adams and Bochner, 2011: 2). I use these aspects of my autobiography to make sense of my experiences, both in autoethnographic writing and analysis.

Conclusion

To conclude, I will draw together some of my criticisms of research in to technological embodiment and the digital double.

Previous studies have focused on building agency and ability to act through the digital double - I am more interested in the ability to perceive and experience that comes from technological bodily extension. In *Bodies in Code*, Hansen argues that our embodied and perceptual abilities are extended, but never refers to bodily feelings or somatic sensations (due to the prioritisation of Merleau-Pontian philosophy of the body). This is a significant flaw in the research area, which as a result dismisses somatic experience, knowledge and philosophy.

I would argue that as our embodied and perceptual abilities are extended, so is our experience of somatic sensations. As such, I propose that the experiences discussed in relation to *Me and My Shadow* are more akin to Merleau-Ponty's blind man's stick than Heidegger's hammer, as the extension was to my ability to perceive somatic sensations, particularly the quality of my movement. This is a significant departure from existing research, including my own previously published work with Popat.

These insights come from an embodied research methodology, and the prioritisation of experience as a form of knowledge making. My experiences of *Me and My Shadow* have led to a consideration of somatic philosophy and dance scholarship, previously absent from research on the digital double, and therefore begin to provide a more holistic understanding of technological embodiment that acknowledges somatic experience and embodied knowing.