

Chapter 17

Narrative environments and the paradigm of embodiment

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(I)t is not a question of whether the physical language of theatre is capable of achieving the same psychological resolutions as the language of words, whether it is able to express feelings and passions as well as words, but whether there are not attitudes in the realm of thought and intelligence that words are incapable of grasping and that gestures and everything partaking of a spatial language attain with more precision...¹

Despite the apparent ubiquity of debates around 'The Body' in social and cultural studies since at least the early 1980s, it is only in the last few years that some consensus has begun to emerge on the deeper philosophical implications of what could now be called the paradigm of embodiment. As philosophers have continued to wrestle with the 'hard problem' of consciousness within the framework of Cartesian mind-body dualism; and as psychologists and cognitive scientists have begun to exploit new experimental techniques and technologies; and as computer scientists have struggled with the real-world limitations of combining artificial intelligence and robotics, a new appreciation has emerged across a broad range of fields of the fact that human beings are essentially embodied creatures.

In the 1970s and 80s the great surge of interest in the body within the field of cultural studies was for the most part both inspired and dominated by the work of Michel Foucault. His hugely influential series of writings on the history of political power and its gradual subjugation of the unruly ‘masses’, presents the body as a basically passive victim of repressive institutional practices. As individual subjects we are inevitably born into a world already fully formed – a game already underway, so to speak – and therefore have to play according to the rules established by others. For Foucault this meant that subjectivity is primarily an ‘effect of discourse’, a cultural construction that obliges us to fall into pre-established social roles. What is not so clear is how the body fights back, what opportunities and mechanisms exist for the subject to carve out a unique place within – and in spite of – the impersonal institutional structures set up to constrain it.

More recent scholarship in the sociology of the body has gone some way towards addressing this imbalance, reasserting the agency of the individual human subject on the basis of its physical embodiment. By drawing on some earlier sources in twentieth century philosophy and experimental psychology (as I will also do later in this chapter) social theorists such as Chris Shilling², Nick Crossley³, and Iain Burkitt⁴ have attempted to develop a more subtle and constructive understanding of subjectivity as emerging from a process of embodied interaction between the individual and society - an interaction that necessarily takes place through the medium of the ‘lived body’. This work also appears to offer something of a reconciliation between what are often seen as antagonistic schools of twentieth century philosophy – phenomenology and structuralism – and it is this broader notion of embodiment as a potentially unifying theme that I will be using as the basis for what follows.

In architecture the recent resurgence of interest in the related themes of embodiment, sensory experience and materiality,⁵ can be seen as part of a more general backlash

against the predominantly textual (and therefore ‘dematerialised’) model of architectural communication and meaning prevalent during the 1980s and 90s. This view of the building as a form of writing – in part a consequence of Jacques Derrida’s famous remark that there is ‘nothing outside the text’⁶ – in fact first gained popularity during the late 1960s and 70s due to the impact of semiotic models of interpretation sweeping through many areas of cultural analysis. In architecture this was also part of a reaction to the post-war modernists’ apparently total neglect of questions of meaning. This resulted in a number of architects and theorists like Robert Venturi, Michael Graves and Charles Jencks reviving some of the nineteenth century debates about architectural style and decoration, leading to a sudden proliferation of historical details and period references, often playfully reinterpreted in modern materials. The downside of this new spirit of freedom and eclecticism was the often superficial application of historical forms, literally flattened out into a flimsy scenographic layering of signifying surfaces - what Venturi was happy to label ‘decorated sheds’ – a process that ultimately devalued the very sources from which these formal references were drawn.

In the 1990s the historical references largely disappeared, at least in most major public projects, but what remained was the dominance of the textual model of designing, debating and deciding about buildings. Virtually no designer wanting to be taken seriously was not also writing about their work, and no major project, design or competition entry was complete without an accompanying quasi-philosophical text, usually a densely argued defence of its ‘deconstructivist’ credentials. In fact it was Derrida’s direct engagement with the work of one or two high-profile designers such as Bernard Tschumi and Peter Eisenman that largely fuelled this frenzy of philosophical borrowing, but its effect was to further reduce the emphasis on the materiality and sensuality of the physical building itself. The ultimate validation of a design was its level of conceptual rigour, mediated by its accompanying textual commentary, rather than the finished building’s functional performance – let alone its experiential richness.

This situation could perhaps be paralleled in the museum world by the longstanding dominance of the curatorial commentary – often still seen as a key element in the ‘disciplinary’ role of the museum as a public institution⁷. The officially sanctioned interpretations that are commonly manifested in labels and text panels, together with gallery maps and guidebooks, can also serve to create a kind of mediating layer between viewer and object that can even lead to some exhibitions becoming little more than a book on the wall. This kind of ‘tyranny of the text’ as it might be called has also been challenged in other areas of cultural activity where a written script can come to dominate over a multi-dimensional and multi-sensory medium. One example of this is the classic statement in performance theory written by Antonin Artaud in the 1930s, *The Theatre and its Double*, which proudly proclaims the embodied language of gesture as the real essence of theatrical communication:

This language created for the senses must from the outset be concerned with satisfying them. This does not prevent it from developing later its full intellectual effect... But it permits the substitution, for the poetry of language, of a poetry in space which will be resolved precisely in the domain which does not belong strictly to words.⁸

Currently there is also good evidence to show that museums are fighting back in a similar way, reasserting the uniqueness and emotional power of the embodied encounter with three-dimensional artefacts arrayed in physical space. In the editorial introduction to the book *Museum Materialities: Objects, Engagements, Interpretations*, Sandra Dudley takes issue with the now all-too-typical emphasis on text-based communication:

...(M)useums’ preference for the informational over the material, and for learning over personal experience more broadly and fundamentally conceived, may risk the

production of displays which inhibit or even preclude such affective responses.

Inevitably, the object-information package can still have the power to move us, but most often does so almost entirely through textually-provided meaning, and threatens to foreclose a more basic, but no less potent, bodily and emotional response to the material itself.⁹

Elsewhere in this and other recent publications in museum studies there are numerous reminders of why text is still such an important vehicle for communication, largely due to the persistence of what could be seen as a master-metaphor for museum making: the idea of the exhibition as a means of storytelling in space. Before examining in more detail the particular nature and opportunities offered by the experience of the 'lived body' moving in architectural space, the next section will briefly consider some of the reasons for the continuing relevance and power of the idea of narrative itself.

The narrative self

As described in the introduction to this book, one of the reasons why narrative has been such a powerful and persistent idea is the fact that it seems to capture something fundamental about the nature of human subjectivity. From Daniel Dennett's notion of the self as a 'centre of narrative gravity',¹⁰ back to David Hume's description of the subject as a 'bundle' of properties and perceptions,¹¹ the self in these formulations acts as a subjective centre from which 'strings or streams of narrative issue forth'.¹² This idea also implies that we have a natural capacity for narrative that helps us make sense of the events happening in the world around us, which the psychologist Jerome Bruner has described in terms of an inherent predisposition towards narrative. In his book *Acts of Meaning* from 1990, Bruner draws both on his own and others' research in developmental psychology, focussing in particular on studies of language acquisition in children:

Certain communicative functions or intentions are well in place before the child has mastered the formal language for expressing them linguistically. At very least, these include indicating, labelling, requesting, and misleading. Looked at naturalistically, it would seem as if the child were partly motivated to master language in order better to fulfil these functions *in vivo*. Indeed there are certain generalised communicative skills crucial to language that also seem in place before language proper begins that are later incorporated into the child's speech once it begins: joint attention to a putative referent, turn taking, mutual exchange, to mention the most prominent.¹³

Bruner goes on to discuss the idea of language as a kind of prosthetic device – a tool for reaching out beyond the confines of the individual body and making things happen in the world. The acts of 'indicating, requesting and misleading' all bear testimony to this instrumental aspect of language, while also highlighting the importance of the intersubjective relationship between the child and a typically adult interlocutor. Bruner refers here to the work of the Russian literary theorist Mikhail Bakhtin on the 'dialogic imagination', claiming that 'all single voices are abstracted from dialogues'¹⁴ – implying that the individual sense of self is something that emerges only gradually as a consequence of these early attempts at communication and interaction with others.

Another aspect of these early learning experiences is the role of narrative in the development of what philosophers often refer to as 'folk psychology', the everyday and commonsense understanding that we have of the behaviour and actions of others, based in part on what could be called a primitive 'theory of mind'.¹⁵ The building blocks of this theory involve the triad of 'belief, desire and action', meaning that we normally interpret people's actions as the result of their underlying beliefs coupled with their current intentions. For example, we might infer that the sight of people running towards a bus-station is probably the result of their desire to catch a bus, combined with their belief that it is about to depart. A number of competing explanations have been put forward to

account for this cognitive ability to grasp the underlying causal structure of everyday actions and events, with opinion generally divided between what has been labelled ‘theory-theory’ and ‘simulation-theory’. The basic argument asks whether we grasp these causal principles not by mentally figuring them out in a conscious process of reasoning and inference (i.e. whether we literally possess a *theory* about what other people are thinking) or whether instead we inwardly *simulate* the actions we observe, sensing them intuitively on a deeper and less conscious level. The neuro-scientific explanation of this kind of bodily understanding of action (also referred to as ‘motor cognition’) involves the recently identified activity of the so-called ‘mirror-neuron’ system – neural pathways in the brain that become active both when we see someone performing an action and when we engage in that same action ourselves.¹⁶

All of this evidence suggests that our developing sense of individual identity is closely tied to our growing sense of bodily agency, an assemblage of the many embodied ‘micro-narratives’ of action and interaction that comprise our everyday commerce with the world. Embodied experience is therefore vital in constituting a bodily repertoire of skills, habits and capacities that equip us to deal with the environment around us. And as the ‘simulation’ theory referred to above suggests, this is something that begins with an instinctive process of unconscious imitation. The central role of the body as the primary vehicle by which these mechanisms operate is something that recent body theory has begun to explore and explain.

The embodiment paradigm

The current resurgence of interest in the body as a theoretical paradigm across a range of arts, humanities and scientific disciplines is partly a consequence of the influential work in social and cultural studies cited at the beginning of this chapter. More significantly it also takes its philosophical inspiration from similar sources in continental philosophy, albeit

from a generation earlier than the French structuralists who inspired Michel Foucault. The school of philosophy known as phenomenology, inaugurated in 1900 in the writings of Edmund Husserl,¹⁷ set out to provide a description of the elementary structures of experience, in order to understand how it is possible for a mind seemingly locked away inside the head to experience a world ‘outside’. A key objective of phenomenology was to escape the limitations of mind-body dualism, entrenched in the history of philosophy since at least the time of Descartes. Phenomenology instead described a continuum between mind, body and world, with the body playing a pivotal intermediary role and providing the vital conduit by which information about – and interaction with – the world can be achieved. By suggesting that to be human is to be embodied, to be ‘extended’ into the world through the medium of the lived and experiencing body, phenomenology offers a model of perception and cognition grounded in the structures and patterns of everyday behaviour. The body is seen as the vehicle of our ‘primordial encounter’ with the world and the means by which we gain our basic ‘grip’ on it.

Recently this bodily framework has been revived and extended in a number of important directions. While it is not possible here to give an exhaustive and detailed survey, I will attempt to briefly summarise what I consider the most important current developments. In cognitive linguistics the Americans George Lakoff and Mark Johnson in the book *Metaphors We Live By*,¹⁸ traced the origin of many figures of everyday speech back to the basic structures of embodied experience. Examining spatial relations such as front-back and up-down, as well as more abstract ideas such as good-bad and past-present, they argued that many of our conceptual categories can be mapped directly onto our intuitive understanding of space as it is experienced by the body. In their later book *Philosophy in the Flesh: The Embodied Mind and its Challenge to Western Thought*,¹⁹ they produced a radical reassessment of the history of philosophy, turning up many typically overlooked examples of the influence of embodiment on philosophical concepts.

The idea that we extend ourselves (and our *understanding* of ourselves) into the world through the medium of language – partly by reference to our bodies as a source of metaphor and analogy – has also been developed in relation to other examples of our everyday interaction with the world through physical tools and technologies. A notable statement of this idea is contained in an influential paper from 1998 entitled ‘The Extended Mind’, co-written by the philosophers Andy Clark and David Chalmers.²⁰ In it they describe the various commonplace ways in which simple mnemonic devices such as notepads and diaries act as a kind of ‘cognitive scaffolding’, not only storing lists of static data but also creating an extended cognitive realm in which the thought process itself can take place. We come to rely on these externalised methods to help us work out solutions and clarify our thinking, much as an artist or architect might use a sketchbook to begin to visualise a vague and partially formed idea. In a later book Clark goes as far as to claim that we are in fact *Natural Born Cyborgs*,²¹ instinctively programmed to co-opt elements of the environment around us to enhance our ability to survive. Rather than treating examples of new ‘invasive’ technologies such as mobile-phones or even medical implants as a threat to our essential humanity, the French philosopher Bernard Stiegler has also tried to situate these developments within a longer evolutionary framework. By considering the positive impact of early tool-making techniques on the expansion and refinement of the human brain, Stiegler makes a convincing case that being human is already to be a partially technological being: ‘The prosthesis is not a mere extension of the human body; it is the constitution of this body *qua* “human”’.²²

Another important dimension of embodiment that is emerging from current research in neuroscience concerns the role of emotion in the processing of information within the brain. Antonio Damasio has published a series of influential books over the past fifteen years or so describing his research into – among other things – the impact of emotion on the storage and retrieval of memories. Damasio’s key innovation is the ‘somatic marker hypothesis’, the idea that all information that passes into the brain carries with it some

kind of emotional charge that helps to determine whether and to what extent it will be accessible to recovery. This idea helps explain why the details of particularly traumatic experiences are so much more vividly remembered and it suggests that their recall involves some form of re-enactment of the experience itself along with its accompanying emotions. This also goes some way to illustrate the importance of personal connection and empathy as part of any educational process – as proponents of so-called ‘situated learning’ have often claimed.²³

Other important areas of neuroscientific research which are helping to bridge the long-standing mind-body divide include the work on mirror-neurons already mentioned above, which is also shedding light on the mechanisms of empathy and ‘social cognition’. More significantly, philosophers such as Evan Thompson are also beginning to assimilate this research into a broader explanatory framework that illustrates the evolutionary emergence of human intelligence from its roots in basic biological processes. In his recent major book *Mind in Life*²⁴ Thompson draws on the work of his previous collaborator the Chilean neuroscientist Francisco Varela, including their co-authored publication *The Embodied Mind* from 1991²⁵ which has since become a classic source for many of the ideas mentioned above. The crux of their position is that consciousness begins in its most basic form as the ability of an organism to respond to changes in its environment, a fundamental characteristic of all biological life. More than simply a passive registering of sensory stimulation it also necessarily involves a cycle of action and reaction - the activation of a circular feedback loop whereby every movement of the organism brings about further changes in the sensory input. For sophisticated beings like us equipped with a nervous system that allows us to move ourselves around within a range of different environments, movement becomes one of the primary modes of engagement and communication with the world. This fact is not lost on philosophers such as Maxine Sheets-Johnstone who has used this idea to help explain a whole variety of phenomena

from technology to language to dance, claiming that what is unique about human intelligence is its embodied grounding in the ‘primacy of movement’.²⁶

What all of the above developments share, to a greater or lesser extent, is a deep intellectual debt to the ground-breaking work on the philosophical implications of embodiment by the French phenomenologist Maurice Merleau-Ponty (1908-61). The final section of this chapter will consider some of the key elements of his analysis of the role of bodily movement in perception and cognition, with the aim of understanding the unique potential of narrative in a spatial as opposed to a merely verbal or textual medium.

A history of interactions: objects, artefacts and situations

In the later part of his life, in the work that remained unfinished at the time of his early death in 1961, Merleau-Ponty had begun to develop a radically new understanding of the relation between human consciousness and the ‘outside’ world. Based on the idea that knowledge emerges from the interaction between the body and the space around it, Merleau-Ponty described the process by which what we think of as a unified individual self is in fact a continually unfolding project. From an initial state of immersion in a primordial entity which he labels the ‘flesh of the world’²⁷ – in which no distinctions yet exist between perceiving subjects and perceived objects – Merleau-Ponty described how through the bodily experience of movement and action a sense of the self as a distinct entity begins to develop. Parallel with his studies in the history of philosophy Merleau-Ponty was also hugely influenced by contemporary research in experimental psychology, particularly from the Gestalt school, along with the seminal work on child development by the Swiss psychologist Jean Piaget. In an essay written during his time as a Professor of Child Psychology at the Sorbonne, Merleau-Ponty anticipated his later formulation of the emergent self:

...the perception of others is made comprehensible if one supposes that psychogenesis begins in a state where the child is unaware of himself and the other as different beings. ... The progress of the child's experience results in his seeing that his body is, after all, closed in on itself. In particular the visual image he acquires of his own body (especially from the mirror) reveals to him a hitherto unsuspected isolation of two subjects who are facing each other. The objectification of his own body discloses to the child his difference, his 'insularity', and, correlative, that of others.²⁸

Another key element in this process of individuation is the development of what Merleau-Ponty variously calls the 'body image' or 'body schema', described in his major work from 1945, the *Phenomenology of Perception*.²⁹ Beyond being simply a static visual image or 'map' of the form and structure of the body, the body schema actually consists of a largely unconscious repertoire of learned skills, routines and bodily capacities that give us an intuitive sense of who we are, in terms of what our bodies are capable of in relation to the possibilities offered by the environment around us. Another French philosopher, Henri Bergson, also a significant influence on Merleau-Ponty's early thinking, had anticipated this notion when he claimed that: 'The objects which surround my body reflect its possible action upon them'.³⁰ This idea that our understanding of an environment begins with a grasp of what the American psychologist James J. Gibson called the 'affordances'³¹ it offers us for action is nowadays often referred to as 'motor cognition'.³² Merleau-Ponty develops this notion in order to emphasise the fact that perception is not something that simply happens to us, as if we are passively registering incoming sensory stimulation as claimed by the eighteenth century Empiricists. In fact there would be no perception and thus effectively no surrounding world if we were not also involved in actively reaching out towards it, projecting our expectations of what might be found there based on our previous bodily experiences. It is this gradually accumulating 'history of interactions' between ourselves and our environment that helps to define what actually 'shows up' in

perception and counts for us as experience. The central role of the body schema in this process reminds us of the fundamental relationship between perception and action, both in terms of the child's process of 'learning how to perceive' described in the quotation above and also in all our attempts to establish an optimum perceptual 'grip' on whatever we are currently confronted with. As Merleau-Ponty describes it:

For each object, as for each picture in an art gallery, there is an optimum distance from which it requires to be seen, a direction viewed from which it vouchsafes most of itself: at a shorter or greater distance we have merely a perception blurred through excess or deficiency. We therefore tend towards the maximum of visibility, and seek a better focus as with a microscope.³³

The process of acquiring the bodily skills to negotiate complex spatial and social environments is a key element of the 'body schema' and therefore also in the development of our sense of self. The American philosopher Hubert Dreyfus has taken Merleau-Ponty's idea further in his description of the various stages involved in the learning process as we progress from novice to expert.³⁴ Dreyfus uses familiar examples of skill-based activities such as chess-playing and woodworking to illustrate the gradual transition from conscious rule-following to (almost) unconscious performance. Drawing also on Martin Heidegger's analysis of the skilful deployment of hand-tools,³⁵ Dreyfus describes a process whereby the tool becomes more and more 'transparent' in use. As the user becomes more competent the tool gradually recedes from view, allowing the focus to shift from tool towards the task itself. This is similar to what happens when a competent driver sits back to enjoy the scenery, rather than constantly paying attention to the controls of the car.

In the context of a narrative environment such as a museum or gallery space, this contrast between transparency and opacity can be created by different degrees of familiarity.

Learning one's way around a space might be achieved quite quickly, thus allowing the focus to shift to learning about the objects and events described in an exhibition. Even if museum narratives also include text and graphics, these things will always be experienced within a spatial setting whose layout and configuration is likely to be unfamiliar to first time visitors. As suggested by Merleau-Ponty's idea of motor cognition based on a bodily repertoire of skills and habits, the balance of familiarity and novelty may actually be crucial to achieving emotional and intellectual impact. The fact that the bodily senses soon become habituated to a constant or repeated stimulus suggests that too much familiarity can also lead to boredom. And if consciousness begins as a response to changes happening in the environment around us, it reminds us of the importance of bodily movement in providing a constantly shifting sensory landscape.

Conclusion

If, as suggested above, narrative is such a vital tool for both cognition and communication – if we can't help seeing the world in terms of 'micro-narratives' of belief, desire and action – it is important to consider what the medium of three-dimensional space can offer to the storytelling process that text alone cannot provide. In order to understand what is unique about the experience of narrative within a spatial and therefore a bodily framework, this chapter has attempted to set out some of the key elements of the 'paradigm of embodiment' – suggesting that both narrative and bodily experience tell us something fundamental about the making of the human self.

For the museum visitor confronted with an arrangement of objects and artefacts, it seems there is a natural motivation to begin to piece together a human story. As Merleau-Ponty himself has memorably suggested:

In the cultural object I feel the close presence of others beneath a veil of anonymity.
Someone uses the pipe for smoking, the spoon for eating, the bell for summoning, and it is through the perception of a human act and another person that the perception of a cultural world could be verified.³⁶

¹ A. Artaud, *The Theatre and its Double*, trans. M. C. Richards, New York: Grove Press, 1958, p. 71.

² C. Shilling, *The Body and Social Theory*, London: Sage, 2003.

³ N. Crossley, *The Social Body: Habit, Identity and Desire*, London: Sage, 2001.

⁴ I. Burkitt, *Bodies of Thought: Embodiment, Identity and Modernity*, London: Sage, 1999.

⁵ See for example: J. Pallasmaa, *The Eyes of the Skin: Architecture and the Senses*, Chichester: Wiley-Academy, 2005; D. Vesely, *Architecture in the Age of Divided Representation: The Question of Creativity in the Shadow of Production*, Cambridge MA: MIT Press, 2004.

⁶ J. Derrida, *Of Grammatology*, trans. G. Spivak. Baltimore: Johns Hopkins University Press, 1976, p. 158.

⁷ E. Hooper-Greenhill, *Museums and the Shaping of Knowledge*, London: Routledge, 1992; T. Bennett, *The Birth of the Museum: History, Theory, Politics*, London: Routledge 1995; C. Duncan, *Civilising Rituals: Inside Public Art Museums*, London: Routledge 1995.

⁸ Artaud, *The Theatre and its Double*, p. 38.

⁹ S. H. Dudley, *Museum Materialities: Objects, Engagements, Interpretations*, London: Routledge, 2009, p. 8.

¹⁰ D. Dennett, *Consciousness Explained*, London: Penguin Books, 1993, p. 418.

¹¹ D. Hume, *A Treatise of Human Nature*, vol. 1, London: J. M. Dent, 1911, p. 239.

¹² Dennett, *Consciousness Explained*, p. 418.

¹³ J. Bruner, *Acts of Meaning*, Cambridge, MA: Harvard University Press, 1990, p. 71.

¹⁴ Ibid., p. xii.

¹⁵ K. Nelson, 'Narrative Practices and Folk Psychology', in D. Hutto, (ed.) *Narrative and Folk Psychology* (vol. 16, issues 6-8 of *Journal of Consciousness Studies*) Thorverton: Imprint Academic, 2002, pp. 69-93.

¹⁶ G. Rizzolatti and C. Sinigaglia, *Mirrors in the Brain: How Our Minds Share Actions and Emotions*, New York: Oxford University Press, 2008.

¹⁷ See E. Husserl, *Logical Investigations*, trans. J. N. Findlay, London: Routledge and Kegan Paul, 1970 [1900].

¹⁸ G. Lakoff and M. Johnson, *Metaphors We Live By*, Chicago: University of Chicago Press, 1980.

¹⁹ G. Lakoff and M. Johnson, *Philosophy in the Flesh: The Embodied Mind and its Challenge to Western Thought*, New York: Basic Books, 1999.

²⁰ A. Clark and D. Chalmers, 'The Extended Mind', *Analysis*, 58.1, 1998: 7-19.

²¹ A. Clark, *Natural-Born Cyborgs: Minds, Technologies and the Future of Human Intelligence*, New York: Oxford University Press, 2003.

²² B. Stiegler, *Technics and Time: The Fault of Epimetheus*, Stanford CA: Stanford University Press, 1998, p. 152-3.

²³ L. Bresler, 'Prelude', in L. Bresler, ed., *Knowing Bodies, Moving Minds: Towards Embodied Teaching and Learning*, Dordrecht: Kluwer Academic Publishers, 2004, p. 9.

²⁴ E. Thompson, *Mind in Life: Biology, Phenomenology and the Sciences of Mind*, Cambridge MA: Belknap Harvard, 2007.

²⁵ F. Varela, E. Thompson and E. Rosch, *The Embodied Mind: Cognitive Science and Human Experience*, Cambridge MA: MIT Press, 1991.

²⁶ M. Sheets-Johnstone, *The Primacy of Movement*, 2nd edn, Amsterdam: John Benjamins, 2011.

²⁷ For Merleau-Ponty's key statement of this idea see: 'The Intertwining – The Chiasm', in *The Visible and the Invisible*, trans. A. Lingis, Evanston IL: Northwestern University Press, 1968, pp. 130-55.

²⁸ M. Merleau-Ponty, 'The Child's Relations with Others', in *The Primacy of Perception: And Other Essays on Phenomenological Psychology, the Philosophy of Art, History and Politics*, ed. J. M. Edie, Evanston, IL: Northwestern University Press, 1964, p. 119.

²⁹ M. Merleau-Ponty, *Phenomenology of Perception*, trans. C. Smith, London: Routledge, 1982, pp. 98-103.

³⁰ H. Bergson, *Matter and Memory*, trans. N. M. Paul and W. S. Palmer, New York: Zone Books, 1988, p. 21.

³¹ See J. J. Gibson, 'The Theory of Affordances', in *The Ecological Approach to Visual Perception*, Hillsdale NJ: Lawrence Erlbaum, 1986, pp. 127-43.

³² For a summary of the current neuroscience see: M. Jeannerod, *Motor Cognition: What Actions Tell the Self*, Oxford: Oxford University Press, 2006.

³³ Merleau-Ponty, *Phenomenology of Perception*, p. 302.

³⁴ H. L. Dreyfus and S. E. Dreyfus, *Mind Over Machine: The Power of Human Intuition and Expertise in the Era of the Computer*, New York: Free Press, 1986, pp. 16-51.

³⁵ M. Heidegger, *Being and Time*, New York: Harper Collins, 1962, pp. 95-102.

³⁶ Merleau-Ponty, *Phenomenology of Perception*, p. 348.