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General Introduction

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mechanisms underpinning a range of conditions (e.g. anxiety, depression, schisophrenia, dementia, anorexia) and the implications for intervention. See http://www.mrc-cbu.cam.ac.uk/people/phil.barnard/

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13 Though the two fields are currently finding common ground, see for example 'Neuro-psychoanalysis', led by Mark Solms, bringing the two fields together. There is also a new theory developed by Phil Mollon called 'Psychoanalytic Energy Psychotherapy' which is based on the ideas of memories being inscribed in the body.

14 Rhonda Blair, *The Actor, Image and Action: Acting and Cognitive Neuroscience*, London: Routledge, p. 81.

15 For example, one of my own practices, Contact Improvisation, in which two partners move improvisationally through a moving point of physical contact, observing laws of gravity, momentum, inertia and so on in spontaneous, conscious exchange. There are other, mainly improvisational, dance systems in which the dancer is guided or auto guides herself through anatomical and/or poetic images.

16 See Jenny Kumiega, *The Theatre of Grotowski*, London: Methuen, 1985.

17 Anecdotally, I was told by a mutual friend that he originally drew his research into the reflexes from his experience as a child in the war crossing a minefield and following the adult in front of him by impulse, physically mirroring exactly what he was doing to avoid danger.

18 The memory of Nazi occupation of Poland and the camps, the rigours of the postwar Communist regime and the suppression of Catholicism surely informed Grotowski's liberational mission in which human spontaneity, whether trained into the discipline of the actor or eventually shared into chosen groups of improvising theatre and laypeople, were methodically engaged in his research into the latent power of reflexed action.

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

20 Stephen Rose, *The Making of Memory*, London: Bantam Books, 1995, p. 91.

21 Interestingly, this act of recreation and spontaneity is exactly what performer training methodologies often seek to encourage: how to bring a freshness and sense of rediscovery anew each time the actor repeats a line or a dancer a movement sequence? This is a paradox that Blair explores in her discussion on actors' impulse: 'a score made spontaneous through successful habituation' (p. 80).

22 Peggy Phelan, 'Dance and the History of Hysteria', in Susan Leigh Foster (ed.), C*orporealities: Dancing Knowledge, Culture and Power*, New York and London: Routledge, 1996, pp. 90–105.

23 Bettelheim, *op. cit*., p. 259.

24 *Ibid*., p. 94.

25 Stephen Rose, *The 21st Century Brain*, London: Vintage Books, 2006, p. 162.

26 *Ibid*.

27 Phelan, *op. cit*.

28 Ami Klin and Warran Jones, in Peter Fonagy, Linda Mayes and Mary Target (eds) *Developmental Science and Psychoanalysis: Integration and Innovation*, London: Karnac, 2007, p. 6

29 We plan a performance video installation.

30 See Pierre Nora (ed.), *Rethinking France Les lieux de mémoire, 4 Vols*, Chicago: University of Chicago Press, 1999–2010.

31 White Lodge was the hunting lodge of George III and the Queen Mother had resided there, so it has a grandiose aspect with large grounds.

32 Bryan Turner, *The Body and Society: Explorations in Social Theory*, 3rd edn, Los Angeles: Sage, 2008, p. 27.

33 *Ibid*., p. 108.

34 Susan Leigh Foster, 'The Ballerina's Phallic Pointe' in C*orporealities*, p. 14.

35 Anna Furse, 'Being Touched' in John Matthews and David Torvell (eds), *A Life of Ethics and Performance*, Newcastle: Cambridge Scholars Publishing, 2011, p. 53.

36 Susie Orbach, *Bodies*, London: Profile Books, 2010, p. 134.

37 Shakespeare, *Hamlet*, 3.1.62–3.

38 Orbach, *op. cit*., p. 58.

39 Nicola Clayton, 'Women in Science: From bird lady to dancing professor', *The Independent* Blogs, 25 July 2011, http://blogs.independent.co.uk/2011/07/25/women-in-science-from-bird-lady-to-dancing-professor/ (accessed 11/04/2012)

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40 The project is situated in the new interdisciplinary Centre of the Body at Goldsmiths that I co-direct with medical historian Dr Ronit Yoeli-Tlalim and an advisory board comprising Dr Monica Greco (Sociology), Dr Lisa Blackman (Media and Communications) and Professor Sophie Day (Anthropology).

41 Antze and Lambek, *op. cit*., p. xix.

Chapter 3

1 Kira O'Reilly, Program note for *Sssshh … Succour*. For the full note, see Keith Gallasch, 'National Review of Live Art: Blood Lines', *Real Time Arts*, Vol. 52 December–January 2002, http://www.realtimearts.net/article/52/9278 (accessed 14 October 2012).

2 Jeff Foss, 'Radical Behaviorism is a Dead End', *Behavioral and Brain Sciences*, Vol. 8, No. 1 (1985), p. 59. Julian Jaynes, 'Sensory Pain and Conscious Pain', *Behavioral and Brain Sciences*, Vol. 8, No. 1 (1985), pp. 61–3. Wallace I Matson, 'One Pain is Enough', *Behavioral and Brain Sciences*, Vol. 8, No. 1 (1985), p. 67. For an extended review of this literature, see Jean E. Jackson, 'Pain and Bodies' in Frances E. Mascia-Lees (ed.), *A Companion to the Anthropology of the Body and Embodiment*, Chichester: Wiley-Blackwell, 2011, pp. 370–87. Also see, Jean E Jackson, 'Stigma, Liminality, and Chronic Pain: Mind-Body Borderlands', *American Ethnologist*, Vol. 32, No. 3 (2005), pp. 332–53.

3 Ronald Melzack,, 'Pain and Parallel Processing', *Behavioral and Brain Sciences*, Vol. 8, No. 1 (1985), pp. 67–8. Wall, Patrick D., 'Not "Pain and Behavior" but Pain in Behavior', *Behavioral and Brain Sciences*, Vol. 8, No. 1 (1985), p.73.

4 John D. Loeser, 'Against Dichotomizing Pain', *Behavioral and Brain Science*, Vol. 8, No. 1 (1985), p. 65.

5 Ploghaus, Alexander, Lina Becena, Cristina Bonar, and David Borsook, 'Neural Circuitry Underlying Pain Modulation: Expectation, Hypnosis, Placebo', *Trends in Cognitive Sciences*, Vol. 7, No. 5 (2003), pp. 197–200; Price, Donald D., 'Psychological and Neural Mechanisms of the Affective Dimension of Pain', *Science*, Vol. 288, (2000), pp. 1769–72.

6 Clifford J. Woolf, 'Deconstructing Pain: A Deterministic Dissection of the Molecular Basis of Pain', in Sarah Coakley and Kay Kaufman Shelemay (eds), *Pain and its Transformations: The Interface of Biology and Culture*, Cambridge, MA: Harvard University Press, 2007, pp. 27–35.

7 Howard L. Fields, 'Setting the Stage for Pain: Allegorical Tales from Neuroscience', in Coakley and Kaufman Shelemay (eds), *Pain and its Transformations*, pp. 36–61.

8 *Ibid*., p. 59.

9 *Ibid*., p. 54. Also, for examples of this phenomenon see Thernstrom, Melanie, *The Pain Chronicles: Cures, Myths, Mysteries, Prayers, Diaries, Brain Scans, Healing and the Science of Suffering*. New York: Farrar, Strauss and Giroux, 2010, p. 8.

10 Irene Tracey, 'Taking the Narrative Out of Pain: Objectifying Pain Through Brain Imaging', in Daniel B. Carr, John B. Loeser and David B. Morris (eds), *Narrative, Pain, and Suffering*, Seattle: IASP Press, 2005, pp. 127–63, p. 127.

11 The Numeric Pain Intensity Scale is a basic measurement on which zero represents no pain and ten represents the worst possible pain. According to the Joint Commission Resources of Physician Leaders in Pain Management, it is the most common way to assess pain intensity in adult patients with normal cognitive function. Like the Wong-Baker FACES Pain Rating Scale, which is typically used with children, the Numeric Pain Intensity Scale only measures one dimension of the pain experience, p. 17.

12 Elaine Scarry, *The Body in Pain: The Making and Unmaking of the World*, New York: Oxford University Press, 1985, p. 5.

13 Cathy Caruth, 'Preface', in Cathy Caruth (ed.), *Trauma: Explorations in Memory*, Baltimore: The Johns Hopkins University Press, 1995, pp. vii–ix, p. viii.

14 Fields, 'Setting the Stage', p. 52. Fields explains that even though 'emphasis on the ascending sensory pathways remains the dominant theme in pain research … there is a growing interest in studying the neural systems that underlie the top-down modulatory factors.'

15 Fields, 'Setting the Stage', p. 44.

16 *Ibid*., pp. 45–6.

17 *Ibid*., pp. 45–6. The emotional component of the pain experience also involves the limbic system. The motivational and emotional dimensions have many overlapping features.

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18 *Ibid*., p. 46.

19 In *An Enquiry Concerning Human Understanding*, David Hume argues that causal assumptions are often very useful, but must not be understood as the whole picture of what is true. He frames causal knowledge as valuable, but incomplete. As a relationship, 'causality' is a story we make up to describe how facts relate to each other. We can empirically observe that facts change, but because how they change is not a fact but a relationship, we can never empirically observe it. Facts on either side of the interaction can be measured, but the interaction that happens in-between facts cannot be measured.

20 Fields, 'Setting the Stage', p. 53.

21 *Ibid*., p. 53, emphasis original.

22 Padfield, Deborah, *Perceptions of Pain*, London: Dewi Lewis Publishing, 2003, p. 23.

23 *Ibid*., p. 105.

24 Arthur Kleinman et al., 'Discussion: The Dislocation, Representation, and Communication of Pain', in Coakley and Kaufman Shelemay, *op cit*., pp. 351–60, 354.

25 Loraine Daston and Peter Galison, *Objectivity*, New York: Zone Books, 2007, p. 17.

26 According to Tracey, physiological measures like heart rate, galvanic skin response, and pupil dilation are not reliable because subjects may habituate quickly or respond nonspecifically. She adds that measures based on behavioural observations like grimacing, limping, or crying out are also unreliable because such behaviours are especially dependent on social and cultural contexts, p. 130.

27 *Ibid*., p. 129.

28 Tracey, 'Taking the Narrative Out', p. 129.

29 *Ibid*., p. 129.

30 Michel Foucault, *The Birth of the Clinic: An Archaeology of Medical Perception*, New York: Vintage, 1994, p. xviii.

31 Daston and Galison, *Objectivity*, p. 395.

32 *Ibid*, p. 391.

33 Gallasch, 'National Review', http://www.realtimearts.net/article/52/9278 (accessed 14 October 2012).

34 Caruth, *Trauma*, p. ix.

35 Shaw Peggy and Suzy Willson, 'Must: The Inside Story' in Jill Dolan (ed.), *A Menopausal Gentleman: The Solo Performances of Peggy Shaw*, Ann Arbor: University of Michigan Press, 2011, pp. 133–58, 143.

36 Jill Dolan, 'Introduction: A Certain Kind of Successful' in *A Menopausal Gentleman*, pp. 1–38, 32.

37 Shaw and Willson, *Must*, p. 142.

38 Caruth, *Trauma*, p. viii.

39 Scarry, *Body*, p. 7.

Introduction

1 There are strong and weak views of embodied cognition – some, like George Lakoff and Mark Johnson, argue that all abstract thoughts are based on physical experiences while others, like Lera Boroditsky and Michael Ramscar, argue that representation does play a role in the manipulation of abstract thinking. See Boroditsky and Ramscar, 'The roles of body and mind in abstract thought', *Psychological Science*, Vol. 13, No. 2, March 2002, pp. 185–9. There are still those who hold to less embodied, more computational models of language and cognition, such as Ray Jackendoff, *Foundations of Language: Brain, Meaning, Grammar, Evolution*. Oxford: Oxford University Press, 2002; and Steven Pinker, *How the Mind Works*. New York: Norton, 1997. For the arguments against these computational and disembodied perspectives and an argument for embodied realism, see George Lakoff and Mark Johnson, *Philosophy in the Flesh: The Embodied Mind and its Challenge to Western Thought*. New York: Basic Books, 1999. For the stronger views of embodied cognition, see: Clark, *Supersizing the Mind: Embodiment, Action, and Cognition*. Oxford: Oxford University Press, 2008; Robbins and Aydede, *A Short Primer on Situated Cognition*. Cambridge: Cambridge University Press, 2009; and Varela, Thompson and Rosch, *The Embodied Mind: Cognitive Science and Human Experience*. Cambridge, MA: The MIT Press, 1993.

2 Alva Noë, *Action in Perception*. Cambridge, MA: The MIT Press, 2004, p. 2.

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3 Michael L. Anderson, 'Embodied Cognition: A Field Guide', *Artificial Intelligence* 149; 2003, p. 101.

4 *Ibid*., 102.

5 David Kirshand Paul Maglio, 'On Distinguishing Epistemic from Pragmatic Action', *Cognitive Science*, Vol. 18, p. 513.

6 Clark, *Supersizing the Mind*, p. 76.

7 See Amy Cook, 'Staging Nothing: Hamlet and Cognitive Science', *SubStance* 35(2), 2006: 87–92 and Bruce McConachie, *Engaging Audiences: A Cognitive Approach to Spectating in the Theatre*, New York: Palgrave Macmillan, 2008: 43.

8 Benjamin K. Bergen, *Louder Than Words: The New Science of How the Mind Makes Meaning*, New York: Basic Books, 2012, p. 4.

9 George Lakoff, *Women, Fire, and Dangerous Things: What Categories Reveal About the Mind*. Chicago, IL: University of Chicago Press, 1987, p. 9.

10 Elizabeth Hart, 'Matter, System, and Early Modern Studies: Outlines for a Materialist Linguistics', *Configurations* 6.3 (1998), pp. 311–43 and Bruce McConachie and Elizabeth Hart, 'Introduction', in Bruce McConachie and Elizabeth Hart (eds), *Performance and Cognition: Theatre Studies and the Cognitive Turn*, London and New York: Routledge, 2006, pp. 1–25.

11 George Lakoff and Mark Johnson, *Metaphors We Live By*, Chicago, IL: University of Chicago Press, 1980; and George Lakoff and Mark Turner, *More Than Cool Reason: A Field Guide to Poetic Metaphor*, Chicago, IL: University of Chicago Press, 1989.

12 On 'mental spaces' see, Gilles Fauconnier, *Mental Spaces: Aspects of Meaning Construction in Natural Language*, Cambridge: Cambridge University Press, 1985. For blending theory, see Gilles Fauconnier and Mark Turner, *The Way We Think: Conceptual Blending and the Mind's Hidden Complexities*, New York: Basic Books, 2002.

13 Mark Johnson, *The Meaning of the Body: Aesthetics of Human Understanding*. Chicago, IL: University of Chicago Press, 2007, p. 132.

14 See Elizabeth Hart, 'Review: The View of Where We've Been and Where We'd like to Go', *College Literature: Cognitive Shakespeare: Criticism and Theory in the Age of Neuroscience*, Vol. 33, No. 1 (2006) p. 233.

15 For applications of cognitive linguistics and blending theory into literature, see Mary Crane, *Shakespeare's Brain: Reading with Cognitive Theory*, Princeton: Princeton University Press, 2001; Mary Crane and Alan Richardson, 'Literary Studies and Cognitive Science: Toward a New Interdisciplinarity', *Mosaic* ,Vol. 32 (1999), pp. 124–40; Barbara Dancygier, *The Language of Stories*, Cambridge: Cambridge University Press, 2012; Donald C. Freeman, 'Othello and the "Ocular Proof" ', *The Shakespearean International Yearbook*, Vol. 4, Aldershot: Ashgate Publishing (2004), pp. 56–71; Patrick Colm Hogan, *Cognitive Science, Literature, and the Arts: A Guide for Humanists*. New York: Routledge, 2003; Ellen Spolsky, *Word vs Image: Cognitive Hunger in Shakespeare' s England*. Basingstoke: Palgrave Macmillan, 2007; Eve Sweetser, 'Whose Rhyme is Whose Reason? Sound and Sense in *Cyrano de Bergerac' Language and Linguistics*, Vol. 15, No. 1 (2006), pp. 29–54; and Mark Turner, *The Literary Mind: The Origins of Thought and Language*, Oxford: Oxford University Press, 1996. For applications in theatre and performance studies, see Rhonda Blair, *The Actor, Image, and Action: Acting and Cognitive Neuroscience*. New York: Routledge, 2008; Amy Cook, *Shakespearean Neuroplay: Reinvigorating the Study of Dramatic Texts and Performance Through Cognitive Science*, New York: Palgrave Macmillan, 2010; McConachie, *Engaging Audiences*; John Lutterbie, *Toward a General Theory of Acting*, New York: Palgrave Macmillan 2011.

16 Alan Richardson provides a cognitive historical analysis of facial expression theory, looking particularly at the way emotions are exposed on the faces of characters in the work of Keats and Austen in his essay 'Facial Expression Theory from Romanticism to the Present' in Lisa Zunshine (ed.), *Introduction to Cognitive Cultural Studies*, Baltimore, MD: Johns Hopkins Press, 2010, pp. 65–83.

Chapter 4

1 See Eve Kosofsky Sedwick, *Touching Feeling: Affect, Pedagogy, Performativity*, Durham and London: Duke University Press, 2003, p. 38.

2 See Gail Kern Paster, *Humoring the Body: Emotions and the Shakespearian Stage*, Chicago and London: University of Chicago Press, 2004, p. 9.

3 *Ibid*., p. 20.

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4 See Gail Kern Paster, *The Body Embarrassed: Drama and the Disciplines of Shame in Early Modern England*, Ithaca and New York: Cornell University Press, 1993, p. 19.

5 *Ibid*., p. 19.

6 *Ibid*., p. 20.

7 Joseph Roach, *The Player's Passion: Studies in the Science of Acting*, Ann Arbor: University of Michigan Press, 1993.

8 *Ibid*., p. 52.

9 *Ibid*., 'To enthusiasts like Heywood and Gildon, each of whom had a public relations task to accomplish on behalf of the theater, such a drawback [that the force of calling up and producing the passions could escape the actor's control] did not seem worth mentioning' (p. 48).

10 Paster, *op. cit*., p. 19

11 See Rhonda Blair, 'How Much is a Loaf of Bread: ASTR Presidential Address (Montreal, 17 November 2011)', *Theatre Survey*, Vol. 53, No. 2 (2012), pp. 299–307. See also Amy Cook, 'For Hecuba or Hamlet: Rethinking Emotion and Empathy in the Theatre,' *Journal of Dramatic Theory and Criticism*, Vol. 25, No. 2 (2011), pp. 71–88; Naomi Rokotnitz, *Trusting Performance: A Cognitive Approach to Embodiment in Drama*, New York: Palgrave Macmillan, 2011.

12 See Roberta Barker, *Early Modern Tragedy, Gender and Performance, 1984–2000: The Destined Livery*, Basingstoke and New York: Palgrave Macmillan, 2007.

13 On blushing, see Corine Dijk, Peter J. de Jong and Madelon L. Peters, 'The Remedial Value of Blushing in the Context of Transgressions and Mishaps', *Emotion*, Vol. 9, No. 2 (2009), pp. 287–91. See also Corine Dijk, Bryan Koenig, Tim Ketelaar and Peter J. de Jong. 'Saved by the Blush: Being Trusted Despite Defecting', *Emotion*, Vol. 11, No. 2 (2011), pp. 313–19. On embarrassment as a sign of prosociality, see Matthew Feinberg, Robb Willer and Dacher Keltner, 'Flustered and Faithful: Embarrassment as a Sign of Prosociality', *Journal of Personality and Social Psychology*, Vol. 102, No. 1 (2012), pp. 81–97.

14 See Ilona E. De Hooge, Seger M. Breugelmans and Marcel Zeelenberg, 'Not So Ugly After All: When Shame Acts as a Commitment Device,' *Journal of Personality and Social Psychology*, Vol. 95, No. 4 (2005), pp. 933–43.

15 See Cook, 'For Hecuba or Hamlet', p. 83.

16 See Robin Bernstein, 'Toward an Integration of Theatre History and Affect Studies: Shame and the Rude Mechs's The Method Gun', *Theatre Journal*, Vol. 64, No. 2 (2012), pp. 213–30.

17 See Paster, *op. cit*., p. 10

18 Thomas Heywood, *A Woman Killed With Kindness*, 8.80–1, in, Kathleen McLuskie and David Bevington (eds) *Plays on Women*, Manchester: Manchester University Press, 1999, pp. 349–416. Subsequent citations in text. What is so fascinating about Heywood's play is how it creates a dramatic narrative from the body. That is to say, the play has a way of suggesting that the bodies themselves are the cause of its tragic story, that one can track the exhibition, rising action, climax and denouement through expression of bodily experience in the play.

19 See Roach, *The Player's Passion*. A lack of control over emotion was bad enough for a man, but for a woman it was almost always associated with 'wantonness and immodesty' (p. 31).

20 See Lena Orlin, *Private Matters in Public Culture in Post-Reformation England*. Ithaca and London: Cornell University Press, 1994. As Orlin nicely puts it, 'the male relationships [in Heywood's play] are … relentlessly contestatory' (p. 165).

21 Elspeth Probyn, *Blush: Faces of Shame*, Minneapolis: University of Minnesota Press, 2005, p. ix.

22 *Ibid*., p. 13.

23 *Ibid*., p. x, p. xii.

24 Anne identifies his feelings as disloyal, explaining that her husband loves Wendoll and freely gives him every material thing he wants. She reminds Wendoll that he is her husband's best friend, and asks him if he is sure he knows what he is saying and to whom he speaks. Her last defence concerns herself, that she dearly loves her husband as much as 'soul's health' (6.109–42).

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25 Andrew Fleck, 'The Ambivalent Blush: Figural and Structural Metonymy, Modesty, and Much Ado About Nothing', *ANQ*, Vol. 19, No. 1 (2006), pp. 16–23, 19. Danielle Clark, 'The Iconography of the Blush' in Kate Chedgzoy, Melanie Hansen and Suzanne Trill (eds), *Voicing Women: Gender and Sexuality in Early Modern Writing*, Keele: Keele University Press, 1996, pp. 111–28, 118.

26 *Ibid*., pp. 16–23, 19.

27 Sedgwick, *op. cit*.

28 Frankford's expression of classical virtue [friendship] undoes his own domestic interest [household]' (Orlin, *Private Matters*, 172).

29 Probyn, *Blush*, p. 14.

30 Anne reveals her part in social relations beyond those of her husband and children when she says at the moment of being found out: 'Here stand I in this place, ashamed to look my servants in the face' (13.149–50).

31 'I charge thee never after this sad day/to see me, or to meet me, or to send/by word, or writing, gift, or otherwise/to move me, by thyself or by thy friends,/nor challenge any part in my two children' (13.174–8).

32 Probyn, *Blush*, p. 21. Here Probyn is actually speaking about her own experience with anorexia, but the way she describes herself sounds very much like how one might characterise Anne in her resolve to 'never will nor eat, nor drink, nor taste/Of any cates that may preserve my life;/ I never will nor smile, nor sleep, nor rest' (16.100–3).

33 *Ibid*., p. 63.

34 This is best evidenced by her brother Acton, who came to 'chide' Anne, but whose 'words of hate' were 'turned to pity and compassionate grief' after seeing her face (17.63–4).

35 Roach, *Player's Passion*, p. 42.

36 See Roach, *ibid*.: 'The [actor's] restraint itself, the stifling results in a more forceful evocation of the fires of passion' (p. 3). Significantly, Heywood's play itself dramatises the power of performing through inhibition of passion. Wendoll, Frankford, and Nicholas all have to act as if they aren't moved by passion, and in doing so appear at their most authoritative, although Wendoll arguably fails.

37 *Ibid*., pp. 42, 55.

38 *Ibid*., p, 39.

39 *Ibid*., p, 32.

40 *Ibid*.: '[The actor's] passions, irradiating the bodies of the spectators through their eyes and ears, could literally transfer the content of his heart to theirs, altering their moral natures' (p. 27).

41 Francis Beaumont and John Fletcher, *The Knight of the Burning Pestle*, Sheldon P. Zitner (ed.), Manchester: Manchester University Press, 2004. ('To the Readers of this Comedy').

42 Mary Thomas Crane, 'What Was Performance?,' *Criticism*, Vol. 43, No. 2 (2001), pp. 169–87, 175.

43 *Ibid*., p. 176–7.

44 See Cook, 'Wrinkles, Wormholes, and Hamlet: The Wooster Group's Hamlet as a Challenge to Periodicity', *The Drama Review*, Vol. 53, No. 4 (2009), pp. 104–19. (106). Cook's use of Crane extends the sense of the kinesthetic in performance as practice in a way that I find extremely helpful, where performance makes actors 'sweat' and builds their muscles.

45 See Roach, *op. cit*. Roach and Crane's understanding of performance in the seventeenth century nicely overlaps in Roach's turn to the language of exercise: 'in theory at least, an actor/orator can master the system of inhibition by diligent practice and exercise' (p. 55).

46 And by acting I mean the performing that takes place within the play to hide that certain characters know more than they should. As Frankford says when Nicholas tells him of his wife's adultery: 'distraction I will banish from my brow/and from my looks exile sad discontent./Their wonted favours in my tongue shall flow;/Till I know all, I'll nothing seem to know' (8.107–11).

47 Roach, *Player's Passion*, p. 4; Paster, *Body Embarrassed*, p. 20.

48 Acton is more explicit about his opinion a few lines earlier, 'My brother Frankford showed too mild a spirit/ In the revenge of such a loathed crime … death to such deeds of shame is the due meed' (17.16–7).

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49 This offers us another way to read the title, and it seems to me that this reading nicely maintains the ambiguity of whose kindness may have killed Anne (I would say Wendoll's, Frankford's and her own for a start), and still makes it possible to read Susan as the other woman 'killed by kindness' in the play, whose hate for Acton is extinguished by his kindness to her brother.

Chapter 5

1 Alva Noë, *Action in Perception*. Cambridge, MA: The MIT Press, 2004, p. 217.

2 See Sophia New and Daniel Belasco Rogers, 'You, Me and Everywhere We Go, plan b', *Performance Research*, Vol. 15, No. 4 (2010), p. 23–31.

3 The critique frequently used to attack the use of science in discussions related to the arts and humanities is the failure of science to address the complexity of experience. 'The charge, at base, is that scientists often describe and model systems that are constituted as much by human engineering as they are by the world. Research systems such as a sealed beaker in a laboratory incubator, or an insulated housing to be sent aloft in a spacecraft, are highly circumscribed and shielded from intrusions. But outside the beaker or box, in the universe at large, the models may very well fail to apply.' Bechtel, William and Andrew Hamilton, 'Reduction, Integration, and the Unity of Science: Natural, Behavioral, and Social Sciences and the Humanities', in Theo A. F. Kuipers (ed.), *Philosophy of Science: Focal Issues*, Amsterdam: Elsevier B. V., 2007, p. 401. It is the contention of this author that, while acknowledging that they are reductive, some scientific findings have significant explanatory power when applied to human experience.

4 See John Lutterbie, *Hearing Voices: Modern Drama and the Problem of Subjectivity*, Ann Arbor: The University of Michigan Press, 1997, pp. 136–9.

5 A. J. Kelso, *Dynamic Patterns: The Self-Organization of Brain and Behavior*, Cambridge and London: The MIT Press, 1995, pp. 6–8.

6 Jerome A. Feldman, *From Molecules to Metaphor: A Neural Theory of Language*, Cambridge: The MIT Press, 2008, pp. 283–94.

7 Eugene T. Gendlin, 'The New Phenomenology of Carrying Forward,' *Continental Philosophy Review*, Vol. 37, No. 1 (2004), p. 128.

8 Feldman, *op. cit*., p. 323.

9 Susan Goldin-Meadow, 'How Gesture Promotes Learning Throughout Childhood,' *Childhood Development Perspectives*, Vol. 3, No. 2 (2009), p. 106.

10 Jana M. Iverson and Esther Thelen. 'Hand, Mouth and Brain: The Dynamic Emergence of Speech and Gesture,' *The Journal of Consciousness Studies*, Vol. 6, No. 11–12 (1999), p. 21.

11 *Ibid*., p. 26.

12 Amy Cook, personal correspondence, February 1, 2013. See Cook, *Shakespearean Neuroplay: Reinvigorating the Study of Dramatic Texts and Performance through Cognitive Science*. New York: Palgrave Macmillan, 2010, pp. 112–22.

13 Iverson and Thelan, *op. cit*., p. 36.

14 Snoop Dogg, and Pilot. 'Gangbang Rookie,' YouTube, http://www.youtube.com/watch?v=EVtwPMnJ4gk&list=PLF11C09DF29FD83A8 (accessed 17 February 2013).

15 Gendlin, *op. cit*., p. 146.

16 Gendlin, *op. cit*., p. 135.

17 An 'aha!' moment is significant only if it is consolidated in memory, if it can be recalled under similar circumstances. This implies a change in neural connectivity, for instance an increase in the number of synaptic buds on a neuron and, therefore, the likelihood a neural pathway will be facilitated in the future – that is, the discovery remembered.

18 Chuck Close, quoted in Maria Popova, 'Chuck Close on Creativity, Work Ethic, and Problem-Solving vs. Problem-Creating,' Brainpickings, http://www.brainpickings.org/index.php/2012/12/27/chuck-close-on-creativity/ (accessed 17 February 2013).

19 Edward Albee, *The Zoo Story* in *The American Dream and The Zoo Story*, New York: Signet Books, 1961, p. 30.

Chapter 6

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1 Jaak Panksepp, 'Affective Consciousness: Core Emotional Feelings in Animals and Humans', *Consciousness and Cognition* Vol. 14 (2005), pp. 30–80; Marie Vandekerckhove and Jaak Panksepp, 'A Neurocognitive Theory of Higher Mental Emergence: From Anoetic Affective Experiences to Noetic Knowledge and Autonoetic Awareness', *Neuroscience and Biobehavioral Reviews*, Vol. 35 (2011), pp. 2017–25.

2 Mary L. Phillips et al., 'Differential Neural responses to Overt and Covert Presentations of Facial Expressions of Fear and Disgust,' *NeuroImage*, Vol. 21 (2004), pp. 1484–96; Jorge Moll et al., 'The Moral Affiliations of Disgust: A Functional MRI Study', *Cognitive Behavioral Neurology*, Vol. 18, No. 1 (2005), pp. 68–78.

3 Neurologist Antonio Damasio has shown that stimuli are first detected in the body; conscious analysis follows later, as a secondary process. This chronology does not determine the relative value of each capacity but suggests that we may experience feelings and emotions without reason – but not reason without emotion. Both are equally integral to the processes of decision making (Antonio Damasio, *The Feeling of What Happens: Body and Emotion in the Making of Consciousness*, New York and London: Harcourt, 1999, pp. 41, 283). For an excellent discussion of current theories of emotion see Amy Cook, 'For Hecuba or for Hamlet: Rethinking Emotion and Empathy in the Theatre', *Journal of Dramatic Theory and Criticism* (2011), pp. 1–17.

4 Marie Vandekerckhove and Jaak Panksepp, 'A Neurocognitive Theory of Higher Mental Emergence: From Anoetic Affective Experiences to Noetic Knowledge and Autonoetic Awareness', *Neuroscience and Biobehavioral Reviews*, Vol. 35 (2011): 2018.

5 Vittorio Gallese, 'The 'Shared Manifold' Hypothesis: From Mirror Neurons to Empathy', *Journal of Consciousness Studies*, Vol. 8, No. 5–7 (2001), pp. 33–50: Paula M. Niedenthal *et al*., 'Embodiment in the Acquisition and Use of Emotion Knowledge' in Lisa Feldman Barret, Paula M. Niedenthal and Pioter Winkielman (eds), *Emotion and Consciousness*, New York: Guilford Press, 2005.

6 Stanley Cavell, *Disowning Knowledge in Six Plays of Shakespeare*, Cambridge: Cambridge University Press, 1987; Ellen Spolsky, *Gaps in Nature: Literary Interpretation and the Modular Mind*, Albany, NY: State University of New York Press, 1993.

7 Ellen Spolsky argues convincingly that our 'vulnerability' in a world characterised by constant flux, is 'just what allows creative innovation'('Darwin and Derrida: Cognitive Literary Theory as a Species of Post-Structuralism', *Poetics Today*, Vol. 23, No. 1 (2001), pp. 43–62).

8 Naomi Rokotnitz, *Trusting Performance: A Cognitive Approach to Embodiment in Drama*, Basingstoke: Palgrave Macmillan, 2011.

9 *Wit* was first performed in 1995 and won the Pulitzer Prize for Drama in 1999.

10 Amy Cook, 'For Hecuba or for Hamlet: Rethinking Emotion and Empathy in the Theatre', *Journal of Dramatic Theory and Criticism* (2011), 11.

11 While I acknowledge that bodies are always, inevitably, also encultured and politicised, I deliberately stay clear of gendering my argument in this chapter, emphasising instead the embodied nature of all humans, of whichever gender, ethnicity, social context or political/religious persuasions. For a survey of feminist fiction on cancer, see Mary K. DeShazer, 'Fractured Borders: Women's Cancer and Feminist Theatre', *Feminist Formations*, Vol. 15, No. 2 (2003), pp. 1–26.

12 Shaun Gallagher and Dan Zahavi, *The Phenomenological Mind: An Introduction to Philosophy of Mind and Cognitive Science*, Abingdon and New York: Routledge, 2008, 148.

13 See David Servan-Schreiber, *Healing Without Freud or Prozac* (London: Rodale, 2004) on forms of therapy that engage the body, accessing our physiology and emotions, without involving conscious, linguistic processes.

14 Mark Johnson, *The Meaning of the Body: Aesthetics of Human Understanding*, Chicago: University of Chicago Press, 2007, p. xii.

15 Andy Clark, 'Where Brain, Body and Mind Collide,' *Daedalus*, Vol. 127, No. 2 (1998), p. 273.

16 *Ibid*., p. 271.

17 Mimicry is the tendency to synchronise affective expressions, vocalisations, postures, and movements with those of another person (Tania Singer and Claus Lamm, 'The Social Neuroscience of Empathy', *The Year in Cognitive Neuroscience: Annals of the New York Academy of Science*, Vol. 1156 (2009), pp. 81–96). Simulation describes the internal replication of observed action through bodily mechanisms that do not require conscious reflection, but rely upon a shared 'brain-body system' (Gallese Vittorio, Christian Keysers and Giacomo Rizzolatti, 'A Unifying View of the Basis of Social Cognition', *Trends in Cognitive Science*, Vol. 8, No. 9 (2004), 397).

18 Gallese, 'The "Shared Manifold" Hypothesis', p. 47.

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19 Hans Herbert Kögler and Karsten R. Steuber (eds), *Empathy and Agency*, Boulder: Westview, 2000.

20 Jean Decety and William Ickes (eds), *The Social Neuroscience of Empathy*, Cambridge, MA: MIT Press, 2011.

21 N. Danziger, M. K. Prkachin and J. C. Willer, 'Is Pain the Price of Empathy? The Perception of Others' Pain in Patients with Congenital Insensitivity to Pain', *Brain*, Vol. 129 (2006), pp. 2494–507.

22 Vittorio Gallese, Christian Keysers and Giacomo Rizzolatti, 'A Unifying View of the Basis of Social Cognition', *Trends in Cognitive Science*, Vol. 8, No. 9 (2004), p. 401.

23 Tanya Singer et al., 'Empathy for Pain Involves the Affective but not the Sensory Components of Pain,' *Science*, Vol. 303 (2004), p. 1157.

24 Pier Francesco Ferrari *et al*., 'Mirror Neurons Responding to the Observation of Ingestive and Communicative Mouth Actions in the Monkey Premotor Cortex', *European Journal of Neuroscience*, Vol. 17 (2003), pp. 1703–14.

25 Elaine Hatfield, John R. Cacioppo and Richard L. Rapson, 'Primitive Emotional Contagion' in Margaret S. Clark (ed.), *Emotion and Social Behavior*, *Review of Personality and Social Psychology*, Vol. 14 (1992), pp. 151–77.

26 Rokotnitz, *Trusting Performance*.

27 Watson and Greenbery in Jean Decety and William Ickes (eds), *The Social Neuroscience of Empathy*, Cambridge, MA: MIT Press, 2011, p. 126.

28 Rosette C. Lamont, 'Coma versus Comma: John Donne's Holy Sonnets in Edson's *Wit*', *The Massachusetts Review*, Vol. 40, No. 4 (1999/2000), p. 569.

29 'Modalities of being' refers to Mathew Ratcliffe, 'Existential Feeling and Psychopathology', *Philosophy, Psychiatry & Psychology*, Vol. 16, No. 2 (2009), pp. 179–94.

30 Martha Stoddard Holmes, 'Pink Ribbons and Public Private Parts: On Not Imagining Ovarian Cancer', *Literature and Medicine*, Vol. 25, No. 2 (2006) p. 483.

31 Holmes herself experienced ovarian cancer. In her essay (Martha Stoddard Holmes, 'Pink Ribbons and Public Private Parts: On Not Imagining Ovarian Cancer', *Literature and Medicine*, Vol. 25, No. 2, (2006), pp. 475–501), she provides an erudite self-examination, which considers the predicament of 'knowing without knowing' (477). By 'anatomizing [her] lack of comprehension'(477), she describes the ease with which an educated and articulate woman may remain unconscious of, or even consciously deny to herself, the intimations of her own body.

32 *Ibid*., p. 497.

33 Elizabeth Klaver, 'A Mind-Body-Flesh Problem: The Case of Margaret Edson's *Wit*', *Contemporary Literature*, Vol. 45, No. 4 (2004), p. 676. Klaver's essay provides an impressive summary of key stages in the history of medical conceptions of the body, as well as the evolution of 'body criticism' and the postmodern discourse surrounding it.

34 *Ibid*., p. 677.

35 *33 Variations* debuted at the Eugene O'Neill Theatre in New York in 2009, with Jane Fonda in the lead as Katherine Brandt, Samantha Mathis as Clara, Colin Hanks as Mike, Susan Kellermann as Gertie, and Zach Grenier as Beethoven. For a broader analysis of *33 Variations*, which also takes account of the dialogue between Romanticism and Existentialism suggested by the play, the added dimension afforded by the historical Beethoven's musical innovations, and by the play's exploration of spacetime potentialities, see Rokotnitz, *Trusting Performance*.

36 Einat Avrahami (ed.), *The European Legacy*, Vol. 16, No. 3 (2011). Special issue: 'Medicine and The Humanities'.

37 Martin Heidegger, *Being and Time* (1927), trans. Joan Stambaugh, New York: New York State University Press, 1996, p. 235.

38 *Ibid*., 1927, p. 235.

39 *Ibid*., 1927, p. 238, italics in the original.

40 Manuella Consonn, 'Semantic Shift and the Experience of Pain,' Presentation at Scholion: Knowledge and Pain Conference, Hebrew University of Jerusalem, May 2010, p. 3.

41 Jean Decety shows that observation of another's pain 'results, in the observer, in the activation of the neural network involved in the processing of firsthand experience of pain. This intimate overlap between the neural circuits […] supports the shared-representation

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theory of social cognition' (Decety and Ickes, *op. cit*., p. 200). The self-other equivalence seems to be easily bridged by pre-conscious mechanisms that respond empathically, but feeds into conscious mechanisms that foster sympathy.

42 Heidegger *op. cit*., p. 241.

43 Einat Avrahami, *The Invading Body: Reading Illness Autobiographies*, Charlottesville and London: University of Virginia Press, 2007, p. 14.

44 Tiffany Martini Field, *Touch*, Cambridge, MA: MIT Press, 2001, p. 57.

45 Maria Henricson, Kerstin Segestena, Anna-Lena Berglund, and Sylivia Määtä, 'Enjoying tactile touch and gaining hope when being cared for in intensive care – A phenomenological hermeneutical study', *Intensive and Critical Care Nursing*, Vol. 25 (2009), p. 323.

46 Henricson *et al*. recount studies that show 'women with diabetes whose levels of blood glucose decreased after tactile touch; 'women during the latent phase of labour who 'could relax and recover their strength after tactile massage: 'and patients with anorexia nervosa who felt 'a sense of relaxation and relief;' women with breast cancer who experienced reduced nausea after the treatment; and stroke-patients who made clear progress in terms of reduced incontinence, improved mobility and hygiene when they received tactile massage. None of the studies reported any negative effects of the treatment' (*ibid*., p. 324).

47 *Ibid*., p, 325.

48 Gallace and Spence, *op. cit*., p. 247.

49 Clark, *op. cit*., p. 259.

50 Jonathan Haidt, *The Happiness Hypothesis*, London: Arrow Books and Random House, 2006, p. xii.

51 Heidegger *op. cit*., pp. 243–4.

52 Haidt, *op. cit*., p. 195.

53 *Ibid*., p. 198.

Introduction

1 Much of this section is derived from Rhonda Blair and John Lutterbie, 'Introduction: *Journal of Dramatic Theory and Criticism's* Special Section on Cognitive Studies, Theatre and Performance,' *Journal of Dramatic Theory and Criticism*, Vol. XXV, No. 2 (Spring 2011), pp. 61–70.

2 Eric R. Kandel and Larry R. Squire "Neuroscience: Breaking Down Scientific Barriers to the Study of Brain and Mind', in Antonio R. Damasio, Anne Harrington, Jerome Kagan, Bruce S. McEwen, Henry Moss and Rashid Shaikh (eds), *Unity of Knowledge: The Convergence of Natural and Human Science*, New York: The Academy of Sciences, 2001, pp. 118–35, 128.

3 Gerald Edelman and Giulio Tononi, *A Universe of Consciousness: How Matter Becomes Imagination*, New York: Basic Books, 2000.

4 Antonio Damasio, *The Feeling of What Happens: Body and Emotion in the Making of Consciousness*, New York: Harcourt Brace & Company, 1999, p. 40 *Unity of Knowledge: The Convergence of Natural and Human Science* 2; also Damasio, *Descartes' Error: Emotion, Reason, and the Human Brain*, New York: Avon Books Inc., 1994, pp. 173–80.

5 Elizabeth Wilson, *Neural Geographies: Feminism and the Microstructure of Cognition*, New York: Routledge, 1998, p. 6.

6 *Ibid*., p. 160.

7 Joseph LeDoux, *Synaptic Self: How Our Brains Become Who We Are*, New York: Penguin Books, 2002, p. 161, emphasis added.

8 Rhonda Blair, *The Actor, Image, and Action: Acting and Cognitive Neuroscience*, New York and London: Routledge, 2008, p. 73.

9 Philip Robbins and Murat Aydede, *The Cambridge Handbook of Situated Cognition*, New York: Cambridge University Press, 2009, p. 3.

10 *Ibid*., pp. 3–4.

11 *Ibid*., p. 7.

12 *Ibid*., pp. 7–8.

13 *Ibid*., p. 8.

14 Evan Thompson, *Mind in Life: Biology, Phenomenology, and the Sciences of Mind*, Cambridge, MA: Harvard University Press, 2007, pp. 10–11.

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15 *Ibid*., p. 13.

16 *Ibid*., p. 60.

17 *Ibid*., p. 43.

18 *Ibid*., p. 119.

19 Wiliam J. Clancy, 'Scientific Antecedents of Situated Cognition' in Philip Robbins and Murat Aydede (eds), *The Cambridge Handbook of Situation Cognition*, New York: Cambridge University Press, 2009, pp. 11–34, 28.

20 Robbins and Aydede, *op. cit*., p. 9.

21 Melissa Gregg and Gregory J. Siegworth, *The Affect Theory Reader*, Durham, NC: Duke University Press, 2002, pp. 5–6.

22 Brian Massumi, 'Foreword' in Gilles Deleuze and Félix Guattari (eds), *A Thousand Plateaus: Capitalism and Schizophrenia*, trans. Brian Massumi, Minneapolis: University of Minnesota Press, 1980, p. xvi.

23 Gregg and Siegworth, *op. cit*., p. 6.

24 Gregg and Siegworth, *op. cit*., p. 6.

25 Gregg and Siegworth, *op. cit*., pp. 7–8.

26 Gregg and Siegworth, *op. cit*., p. 9.

27 Gregg and Siegworth, *op. cit*., p. 14.

28 Gregg and Siegworth, op. cit., p. 325.

29 Rhonda Blair, class discussion with Marla Carlson, University of Georgia (Athens, GA) Skype session, Dallas, 7 March 2013.

30 John Lutterbie, *Toward a General Theory of Acting: Cognitive Science and Performance*, New York: Palgrave Macmillan, 2011, p. 10.

Chapter 7

1 Much of this work and the larger body from which this is taken is predicated on the seminal work of David McNeill. See David McNeill, *Hand and Mind: What Gestures Reveal About Thought*. Chicago: University of Chicago Press, 1992; and *Gesture and Thought*, Chicago: University of Chicago Press, 2005.

2 Anne Bogart, *A Director Prepares: Seven Essays On Art And Theatre*, New York: Routledge, 2001, p. 22.

3 Lee Strasberg, *A Dream of Passion: The Development of the Method*, Evangeline Morphos (ed.), New York: Plume, 1988, pp. 69–70.

4 This is, of course, referencing Eugenio Barba's critical work in Barba, Eugenio. *A Dictionary of Theatre Anthropology: The Secret Art of the Performer*, London: Routledge, 1991, which I will return to on several occasions throughout this work. For Barba, a theatrical event is 'extra-daily' because it is framed and, thus, offers the potential for heightened meaning-making.

5 Bruce McConachie, 'Falsifiable Theories for Theatre and Performance Studies', *Theatre Journal*, Vol. 59, No. 4 (2007), pp. 553–77.

6 *Ibid*., p. 571.

7 Joseph R. Roach, *The Player's Passion: Studies in the Science of Acting*, Ann Arbor: The University of Michigan Press, 1993.

8 Declan Donnellan, *The Actor and the Target*. London: Theatre Communications Group, 2006, p. 89.

9 John Lutterbie, *Toward a General Theory of Acting: Cognitive Science and Performance*. New York: Palgrave Macmillan, 2011, p. 123.

10 William Shakespeare, Sonnets 106 and 110. *The Riverside Shakespeare* 2nd edn, Blakemore Evans (ed.), Boston: Houghton Mifflin, 1997. Sonnets were chosen for the study because they first and foremost came from a literary/dramaturgical source of fairly universal acclaim. Moreover, two of the lesser known sonnets were chosen so as to hopefully resemble the heightened text an actor might encounter but not be so familiar as to have likely been memorised before. No interview process was conducted to ascertain whether or not the subjects had, in fact, been exposed to either sonnets in any capacity.

11 It should be noted that for this study I coded all of the text and was not able to secure an independent assistant.

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12 I ruled out Sonnet 110 because, purely from a subjective observation, it seemed like subjects were getting hung up on the word 'forget'st'. While not part of this specific investigation, it is entirely possible that the word was acting as a kind of cognitive prompt. Not only were they having difficulty remembering the word it is possible the word itself was causing them to actually *forget* the word, 'forget'. Obviously this needs much more research.

13 Likewise, volunteer subjects were taken from Introduction to Theatre, Acting 1, Theatre History, and Script Analysis classes. Subjects were offered 15 extra credit points for participation.

14 As opposed to an 'other-generated' cue, which would include someone else's arbitrary choreography. I will show that when the individual agent is able to generate movement on her own she is clearly able to us her body organically to find meaning and connection.

15 Wu Choon and Seana Coulson, 'Meaningful Gestures: Electrophysiological Indices of Iconic Gesture Comprehension,' *Psychophysiology*, Vol. 42 (2005), pp. 654–67.

16 Donna Frick-Horbury and Robert E. Guttentag. 'The Effects of Restricting Hand Gesture Production on Lexical Retrieval and Free Recall', *Journal of Psychology*, Vol. 111, No. 1 (1998), p. 2.

17 Donna Frick-Horbury, 'The Use of Hand Gestures as Self-Generated Cues for Recall of Verbally Associated Targets', *The American Journal of Psychology* 115, No. 1 (2002), pp. 5–9.

18 Wolff-Michael Roth and Daniel V. Lawless. 'How Does the Body Get into the Mind', *Human Studies*, Vol. 25, No. 33 (2002), p. 344.

19 Roger Schank proposes that a dynamic memory system is one that of an open, flexible system that allows for constant, online updating as opposed to a library, for instance, which has a fixed set of information. For the most part, the changes in our memory are not conscious. In *Dynamic Memory Revisited*, he writes: 'Our memories change dynamically in the way they store information by abstracting significant generalizations from our experiences and storing the exceptions to those generalizations.' See Roger C. Schank, *Dynamic Memory Revisited*, Cambridge: Cambridge University Press, 1999, p. 2.

20 Kay Young and Jeffrey L. Saver, 'The Neurology of Narrative', *SubStance*, Vol. 30, No. 1 (2001), p. 73.

21 *Ibid*., p. 74.

22 Helga Noice and Tony Noice, 'The Non-Literal Enactment Effect: Filling in the Blanks', *Discourse Processes*, Vol. 44, No. 2 (2007), pp. 73–89.

23 See Frick-Horbury The Effects of Restricting' 43–62; Clark *Supersizing* 123–5; and Cook 'The Role of Gesture in Learning', pp. 211–32.

24 A growth point is David McNeill's term for the 'psychological predicates' on which the communicative acts are built. See McNeilll *Gesture and Thought*, p. 82; Cook, 'The Role of Gesture in Learning', p. 127.

25 Gallagher, *How the Body Shapes the Mind*, p. 11.

Chapter 8

1 Shaun Gallagher makes a useful distinction between body image and body schema, by describing the former as a body as it appears from within the perceptual field, and the latter as the means by which the configuration and use of a body, shapes the perceptual field itself. See Shaun Gallagher, *How the Body Shapes the Mind*. Oxford: Oxford University Press, 2005.

2 See for example Gail Weiss and Honi Fern Haber (eds), *Perspectives on Embodiment: The Intersections of Nature and Culture*, London: Routledge, 1999; Josephine Machon, *(Syn)aesthetics: Redefining Visceral Performance*, Basingstoke: Palgrave MacMillan, 2009.

3 Ruth Leys, 'The Turn to Affect: A Critique', *Critical Enquiry*, Vol. 37, No. 3 (2011), pp. 443, 437

4 *Ibid*., p. 443.

5 Daniel N. Stern, 'The Role of Feelings for an Interpersonal Self' in Ulric Neisser (ed.), *The Perceived Self: Ecological and Interpersonal Sources of Self Knowledge*, Cambridge: Cambridge University Press, 1993, p. 206.

6 For more in depth discussions of this perspective see, for example, Alva Noë, *Action in Perception*. Cambridge, MA: MIT Press, 2006; Mark Johnson, *The Meaning of the Body: Aesthetics of Human Understanding*, Chicago IL: University of Chicago Press, 2007.

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7 See for example Martin Welton, *Feeling Theatre*, Basingstoke: Palgrave MacMillan, 2012.

8 Harry Heft, *Ecological Psychology in Context: James Gibson, Roger Barker, and the Legacy of William James's Radical Empiricism*, Mahwah, New Jersey and London: Lawrence Erlbaum Associates, 2001, p. 28.

9 Daniel Heller-Roazen, *The Inner Touch: Archaeology of a Sensation*, New York: Zone Books, 2007, p. 295. A similar sort of question is explored by Eve Kosofsky Sedgewick in *Touching Feeling: Affect, Pedagogy, Performativity*, Durham: Duke University Press, 2003.

10 See, for example Roberta Mock (ed.), *Walking, Writing and Performance: Autobiographical Texts by Deirdre Heddon, Carl Lavery and Phil Smith*, Exeter: Intellect, 2009; Mischa Myers, ' "Walk with me, talk with me": The Art of Conversive Wayfinding', *Visual Studies*, Vol. 25, No. 1 (2010), pp. 59–68.

11 See for example, Gabriella Giannachi and Nigel Stewart (eds), *Performing Nature: Explorations in Ecology and the Arts*, Oxford: Peter Lang, 2005.

12 See for example, Tim Edensor, 'Walking Through Ruins' in Tim Ingold and Jo Lee Vergunst (eds), *Ways of Walking: Ethnography and Practice on Foot*, Farnham: Ashgate, 2008, pp. 123–42.

13 By 'sensory' here, I am referring to the perceptual content of the activities of looking, listening, feeling and so on. As discussed earlier, the 'affective' here refers to the overall sense or quality of 'how it goes' that those more particular perceptions converge with.

14 Tim Ingold, 'Culture on the Ground: The World Perceived Through the Feet', *Journal of Material Culture*, Vol. 9, No. 3 (2004), pp. 315–430.

15 See for example, Debbie Green and Ita O'Brien, 'From Grounded Foot to Leaping Foot', *Theatre, Dance and Performance Training*, Vol. 3, No. 1 (2012), pp. 99–118. A notable exception to this received wisdom is the training system developed by Tadashi Suzuki and his collaborators (see for example, Paul Allain *The Art of Stillness: The Theatre Practice of Tadashi Suzuki*. London: Methuen, 2002). Although it does work directly in developing performers dynamic sense of the relationship between foot and floor as a means of energising performance, as a *system*, it works more with a particular style or approach to stepping, stamping and walking, than with the more 'pedestrian', and environmentally responsive footwork that has informed our experiments at Bunce's Barn.

16 Mike Alfreds, *Different Every Night: Freeing the Actor*, London: Nick Hern Books, 2007, p. 209.

17 As John Searle has argued, even though Descartes' ideas have been regularly dismissed, his vocabulary has proven remarkably enduring. See John R. Searle, *The Rediscovery of the Mind*, Cambridge, MA: The MIT Press, 1994, p. 14.

18 The phrase was used by Tallis in a debate with Matthew Taylor at the Royal Society of Arts in 2011 entitled 'Neuromania: The Possibilities and Pitfalls of Our Fascination With Brains'. Much of the same topic is discussed by him in *Aping Mankind: Neuromania, Darwinitis, and the Misrepresentation of Humanity*, London: Acumen, 2011. His debate with Taylor can be viewed online at: http://www.thersa.org/events/video/vision-videos/neuromania-the-possibilities-and-pitfalls-of-our-fascination-with-brains (accessed 5 October 2012).

19 Anthony Chemero, *Radical Embodied Cognitive Science*', Cambridge, MA: MIT Press, 2009, p. 201.

20 The theory of affordances is most explicitly laid out by Gibson in *The Ecological Approach to Visual Perception*, Hillsdale, NJ: Lawrence Erlbaum Associates, 1986.

21 Gibson, *op. cit*., p. 129.

22 Chemero, *op. cit*., p. 155.

23 *Ibid*., p. 158.

24 *Ibid*., p. 201.

25 For a further discussion of infrastructure and superstructure relative to footwork, see Tim Ingold, 'Footprints Through the Weather-world: Walking, Breathing, Knowing', *Journal of the Royal Anthropological Institute*, Vol. 16, No. S1 (2010), pp. S121–S139.

26 Drew Leder, *The Absent Body*, Chicago IL: University of Chicago Press, 1990.

27 For further discussion see David Krasner, *Method Acting Reconsidered: Theory, Practice, Future*. Basingstoke: Palgrave, 2009.

28 'To attend to a bodily sensation' Csordas proposes, 'is not to attend to the body as an isolated object, but to attend to the body's situation in the world … Attention *to* a bodily sensation can thus become a mode of attending to the intersubjective milieu that give

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rise to that sensation. Thus, one is paying attention *with* one's body'; 'Somatic Modes of Attention', *Cultural Anthropology*, Vol. 8, No. 2 (1993), p. 138.

29 Gibson, 1986, *op. cit*., p. 226.

30 Tim Ingold and Jo Lee Vergunst (eds), *Ways of Walking: Ethnography and Practice on Foot*, Farnham: Ashgate, 2008, p. 2.

31 'Smooth tactilities' is a term use by Edensor, 2008.

32 Gibson, *op. cit*., p. 223.

33 Maxine Sheets-Johnstone, *The Corporeal Turn: An Interdisciplinary Reader*, Exeter: Imprint Academic, 2009, p. 137.

34 *The Senses of Touch: Haptics, Affects and Technologies*. Oxford: Berg, 2007.

35 Instances of specialist practices like ballet might seem to contradict this. However, taken off-stage and 'off-pointe' the case would surely remain the same, inasmuch as technique is, in some respects, as much a habit as are more quotidian movements.

36 Michel Serres, *The Five Senses: A Philosophy of Mingled Bodies*, trans. Margaret Sankey and Peter Cowley, London: Continuum, 2008, p. 80.

37 Heller-Roazan, *op cit*.

38 Sheets-Johnstone, 2009, *op. cit*., p. 147.

Chapter 9

1 The notion of 'theatre cultures' was proposed by Fabrizio Cruciani and denotes the collaboration between theatre theory and practice: 'Theatre makes sense when it is organically living: when it is not just either performance art and technique or history of performances and theories, but when it becomes *theatre culture*'; Fabrizio Cruciani, 'Il "luogo dei possibili" ' in Clelia Falletti (ed.), *Il corpo scenico* , Roma: Editoria & Spettacolo, 2008, pp. 168–71.

2 Nicola Modugno, Intervention at the First International Conference 'Dialoghi tra teatro e neuroscienze', 20 marzo 2009, non-published transcription.

3 For the scientific paper see Nicola Modugno et al., 'Active Theater as a Complementary Therapy for Parkinson's Disease Rehabilitation: A Pilot Study', *The Scientific World Journal*, No. 10 (2010), pp. 2301–13. For a wider and less technical account of the project, see Nicola Modugno 'Oltre il dialogo la simbiosi. Un modello di teatro terapeutico per i pazienti affetti da malattia di Parkinson' in Clelia Falletti and Gabriele Sofia (eds), *Nuovi dialoghi tra teatro e neuroscienze*, Roma: Editoria & Spettacolo, 2011, pp. 43–55.

4 Modugno et al., 'Active theater', p. 2302.

5 *Ibid*., p. 2312.

6 *Ibid*., p. 2311.

7 This perspective characterises what, for instance, Marco De Marinis called 'Nuova teatrologia' ('*New Theatrology*'); see Marco De Marinis, *Capire il teatro. Lineamenti di una nuova teatrologia*. Firenze: La Casa Usher, 1988; 'New Theatrology and Performance Studies: Starting Points Towards a Dialogue', *The Drama Review*, Vol. 55, No. 4 (2011), pp. 64–74.

8 Some remarkable exceptions are the experiments carried out by Corinne Jola and colleagues: see Jola et al., 'Arousal decrease in Sleeping Beauty: audiences' neurophysiological correlates to watching a narrative dance performance of two-and-a-half hours', *Dance Research*, Vol. 29, No. 2 (2011), pp. 378–403; Jola et al., 'Motor Simulation without Motor Expertise: Enhanced Corticospinal Excitability in Visually Experienced Dance Spectators', *PLoS ONE*, Vol. 7, No. 3 (2012), p. 333, 43.

9 In the recent years there has been a great number of scientific publications on this subject. For a global review see Giacomo Rizzolatti and Corrado Sinigaglia, *Mirrors in the Brain: How our minds share action and emotions*, Oxford: Oxford University Press, 2008; for a more complete and updated review see Giacomo Rizzolatti and Maddalena Fabbri-Destro, 'Mirror neurons: from discovery to autism', *Experimental Brain Research*, No. 200 (2010), pp. 223–37.

10 See Francisco J. Varela, Evan Thompson and Eleanor Rosch, *The Embodied Mind: Cognitive Science and Human Experience*. Cambridge, MA: MIT Press, 1991; Shaun Gallagher, *How the Body Shapes the Mind*, Oxford: Oxford University Press, 2006.

11 Rizzolatti and Sinigaglia, *Mirrors in the Brain*, p. 127.

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12 Eugenio Barba, *On Directing And Dramaturgy: Burning The House*, New York and London: Routledge, 2010, p. 33.

13 See M. A. Umiltà et al.,'When pliers become fingers in the monkey', *Proceedings of the National Academy of Sciences*, Vol. 105, No. 6 (2008), pp. 2209–13.

14 Gallese 2007; Gallese et al., 2007.

15 In the work written by Alain Berthoz in collaboration with the philosopher Jean-Luc Petit, this concept is often dwelled upon: 'The brain is a predictor, the physiologist willingly asserts. And right away we find ourselves confronted with a striking revision of the classical paradigm, a revision according to which anticipation, instead of being an exception, proves to be the rule for any intelligent behavior.' Alain Berthoz and Jean-Luc Petit, *The Physiology and Phenomenology of Action*, Oxford: Oxford University Press, 2008, p. 19.

16 Gallagher, *How the Body Shapes the Mind*, p. 234.

17 Dorothée Legrand, 'Body Intention and the Unreasonable Intentional Agent' in Franck Grammont, Dorothée Legrand and Pierre Livet (eds), *Naturalizing Intention in Action*, Cambridge, MA: MIT Press, 2010, pp. 161–80, 167. It is interesting to remark that at the beginning of the 1990s Eugenio Barba had already highlighted how important it is that the actor becomes aware of such pre-reflexive mechanisms of action anticipation: 'In the case of an action or reaction, the position of each finger changes as soon as the eyes have transmitted the relevant information, depending on whether we are about to pick up a piece of broken glass or a bread crumb, a heavy dictionary or an inflated balloon. Our fingers, before reaching the object, already assume the muscular tonus suitable to the weight and tactile quality of the object. The manipulatory muscles are already at work. The asymmetry of the fingers is a sign of life, of credibility, manifest by means of the tensions of the manipulatory muscles, which are ready to act according to the weight, the temperature, the volume, the fragility of the object towards which the hand is extended, but also according to the affective reaction which the object elicits in us.' (Eugenio Barba, *The Paper Canoe. A Guide to Theatre Anthropology*, London: Routledge, 1995, p. 25.)

18 This is what Odin Teatret defined as *sats*, that is, a moment of transition from an action to another. Identifying this precise moment, which lies unseen in the everyday life, allows the actor to lead the spectator to make a certain forecast, so that he can eventually decide whether surprising him or confirming the spectator's expectation (*ibid*., p. 54).

19 Taking into account another example, the first principle of Meyerhold's biomechanics states: 'The whole biomechanics is based on this fact: if the nose works, the whole body works as well.' Vsevolod Meyerhold, 'Principes de Biomécanique' in *Écrits sur le théâtre. Tome II, 1917–1929. Nouvelle édition revue et augmentée*, Lausanne: La Cité-L'Age d'Homme, 2009, pp. 100–3, 100.

20 For instance, every time the actor executes an action on stage, his attention is not only addressed to the goal of his action but also to the spectators' attention. In other words, at the same time the actor has to attend to a 'double task': executing the action and directing the spectator's attention. In this way, performing different body techniques allows the actor to increase his attention skills, which are essential to maintain his continuing relationship with the spectator. Therefore, the improvement of the actor's body control is aimed at accomplishing his 'double task': doing something and stimulating the spectator at the same time.

21 The notion of *thinking in motion* was proposed in 1988 by John Blacking, the founder of Ethnomusicology, during the seminar 'Theatre, Anthropology, and Theatre Anthropology', organized by the Centre for Performance Research in Leicester, in the autumn of 1988.

22 Emmanuel De Saint Aubert, 'Espace et schéma corporel dans la philosophie de la chair de Merleau-Ponty' in Alain Berthoz and Bernard Andrieu (eds), *Le corps en acte*, Nancy: Presses Universitaires de Nancy, 2010, pp. 123–52, 125.

23 Pamela Quinn, 'Moving Through Parkinson's. When her body rebelled, one dancer fought back', *Dance Magazine*, December 2007.

24 Vittorio Gallese and George Lakoff, 'The Brain's Concepts: The Role of the Sensory-motor System in Conceptual Knowledge', *Cognitive Neuropsychology*, No. 22 (2005), p. 455–79.

25 For further information and technical details of the experiment see Sofia et al.,'Il linguaggio incarnato dell'attore. Indicazioni preliminari di un esperimento pilota' in Clelia Falletti and Gabriele Sofia (eds), *Prospettive su teatro e neuroscienze. Dialoghi e sperimentazioni*, Roma: Bulzoni, 2012.

26 Antoinin Artaud, *Le théâtre et son double*, Gallimard: Paris, 1938.

27 Fabrizio Cruciani, *Registi pedagoghi e comunità teatrali del Novecento*, Roma: Editori & Associati, 1995.

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28 Let us consider a specific example. Since 1993 the Maltese director and theatre professor John Schranz has collaborated with the neuroscientist Richard Muscat on several research projects, in particular the creation of the European joint Masters in Science of Performative Creativity (www.ema-ps.com). In a recent article, in which both the experts discussed the mutual benefits arisen from their collaboration, Muscat wrote: 'The size nerve cells is 10^{-6} of a metre. They are microns. This is the sort of work I do in my laboratory, in which I look at particular cells and see how their characteristics change when I would have applied a particular drug. The interesting thing is to see now, because of my work with John, what may happen to these particular cells in the rat if now I alter their behaviour through a form of training which I design in reflection of the behaviour I choose to select from what I see in the performance of the actor' (John Schranz and Richard Muscat, 'What is it to be Human? A Theatre Neuroscience Perspective', *Culture Teatrali*, No. 17 (2007), pp. 89–115). Although wishing to underline the wide gap and difference that separates the work on the actor and that on the guinea-pigs, we cannot disregard the existing dialogue though which exchanging ideas and practices can provide solutions that were so far unexpected and unimagined.

29 Jean Marie Colombani, Jean Marie and Edwy Plenel, Edwy, 'Un entretien avec Edgar Morin', *Le Monde*, 26 November 1991.

Introduction

1 Andreas K. Engle, 'Directive Minds: How Dynamics Shapes Cognition' in John Stewart, Olivier Gapenne and Ezequiel A. Di Paolo (eds), *Enaction: Toward a New Paradigm for Cognitive Science*, Cambridge, MA: MIT Press, 2010, p. 221.

2 Andy Clark, *Being There: Putting Brain, Body, and World Together Again*, Cambridge, MA: MIT Press, 1997, p. 47.

3 Brian Boyd, *On the Origin of Stories: Evolution, Cognition, and Fiction*, Cambridge, MA: Harvard University Press, 2009. According to Boyd, all art is 'a kind of cognitive *play*, the set of activities designed to engage human *attention* through their own appeal to our preference for inferentially rich and therefore *patterned* information' (italics in original) (Boyd, *Origin of Stories*, p. 85). I have explored these connections recently in 'An Evolutionary Perspective on Play, Performance, and Ritual', *TDR*, Vol. 55, No. 4 (Winter 2011), pp. 33–50.

4 For an illuminating summary of Gerstmyer's role-playing experiments with his daughter, see Sutton-Smith, Brian, *The Ambiguity of Play*, Cambridge, MA: Harvard University Press, 1997, pp. 193–4.

5 Clark, *Being There*, *op. cit.*, p. 221.

6 See James J. Gibson, *The Ecological Approach to Visual Perception*, Boston: Houghton Mifflin, 1979. For recent applications of Gibson's work to theatre studies, see Paavolainen, Teemu, *Theatre, Ecology, Cognition: Theorizing Performer-Object Interaction in Grotowski, Kantor, and Meyerhold*, New York: Palgrave Macmillan, 2012 and Tribble, Evelyn, *Cognition in the Globe: Attention and Memory in Shakespeare's Theatre*, New York: Palgrave Macmillan, 2011.

7 Lyn Gardner, 'Anxiety Theatre,' http://www.guardian.co.uk/stage/theatre-blog/2009/mar/02/anxiety-theatre (accessed 13 August 2011). For further discussion of this problem and how researchers are currently understanding it, see Shaughnessy, Nicola, *Applying Performance: Live Art, Socially Engaged Theatre, and Affective Practice*, Basingstoke: Palgrave Macmillan, 2012, pp. 192–201.

8 Jaak Panksepp, *Affective Neuroscience: The Foundations of Human and Animal Emotions*, New York: Oxford University Press, 1998, p. 14. See McConachie, Bruce, *Engaging Audiences: A Cognitive Approach to Spectating in the Theatre*, New York: Palgrave Macmillan, 2008, pp. 93–6, 106–13, for my discussion and use of Panksepp's ideas.

9 *Ibid.*, p. 15.

10 Antonio Damasio, *The Feeling of What Happens: Body and Emotion in the Making of Consciousness*, New York: Harcourt, 1999, p. 55. See also Damasio's, *Looking for Spinoza: Joy, Sorrow, and the Feeling Brain*, New York: Harcourt, 2003.

11 Walter J. Freeman, *How Brains Make Up Their Minds*, New York: Columbia University Press, 2000, pp. 91–2.

12 I have relied primarily on Simon Baron-Cohen, *Mindblindness: An Essay on Autism and Theory of Mind*, Cambridge, MA, MIT Press, 1995, Jean Decety and William Ickes (eds), *The Social Neuroscience of Empathy*, Cambridge, MA: MIT Press, 2009, and Steuber, Karsten, *Rediscovering Empathy: Agency, Folk Psychology, and the Human Sciences*, Cambridge, MA: MIT Press, 2006, and Thompson, Evan, *Mind in Life: Biology, Phenomenology, and the Sciences of Mind*, Cambridge, MA: Harvard University Press, 2007, for insights into empathy.

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13 Thompson, *op. cit*. pp. 393–5.

14 Thompson, *op. cit*., pp. 395–7.

15 See Simone G. Shamay-Tsoory, 'Empathic Processing: Its Cognitive and Affective Dimensions and Neuroanatomical Basis' in *The Social Neuroscience of Empathy*, pp. 215–32.

16 Thompson, *op. cit*., p. 398, 402.

17 On the response of the critics to *A Streetcar Named Desire*, see my *American Theater in the Culture of the Cold War: Producing and Contesting Containment*, Iowa City, IA: University of Iowa Press, 2003, pp. 93–3 and Philip C. Kolin, *Williams: A Streetcar Named Desire*, Plays in Production, Cambridge: Cambridge University Press, 2000. All theatre reviews of the premiere of *Streetcar* in 1947 by Atkinson, Barnes, Chapman, Coleman, Garland, Hawkins, Morehouse, Kronenberger and Watts may be found in Rachel Coffin (ed.), *New York Theatre Critics' Reviews*, Vol. 8 (1947), New York: Critics' Theatre Reviews, 1948, pp. 249–52.

18 Regarding the critical response to the Clurman-Hagen-Quinn *Streetcar*, see Kolin, *Streetcar*, pp. 33–9.

19 On emotional contagion, see Elaine Hatfield, John R. Cacioppo and Richard L. Rapson, 'Primitive Emotional Contagion' in Clark, Margaret S. (ed), *Emotion and Social Behavior*, Review of Personality and Social Psychology, Vol. 14, Newbury Park, CA: Sage Publications, 1992, pp. 151–77. In *Engaging Audiences*, pp. 92–8, I bring other scientific and historical insights to bear on emotional contagion. Michael H. Thaut discusses entrainment and its effects in listening to music in 'Rhythm, Human Temporality, and Brain Function' in Dorothy Meill, Raymond MacDonald and Donald J. Hargreaves (eds), *Musical Communication*, Oxford: Oxford University Press, 2005, pp. 171–91.

20 Carl Plantinga, *Moving Viewers: American Film and The Spectator's Experience*, Berkeley: University of California Press, 2009.

21 For Plantinga's types and timing of spectators' emotional engagement, see *Moving Viewers*, pp. 48–77.

Chapter 10

1 See Josephine Machon, *(Syn)aesthetics: Redefining Visceral Performance*, Basingstoke: Palgrave 2009; *Immersive Theatres: Intimacy and Immediacy in Contemporary Performance*, Basingstoke: Palgrave, 2013.

2 The somatic, ('affecting the body' or 'absorbed through the body') and the semantic (the 'mental reading' of signs).

3 Noetic cognition, (from the Greek derived, *noēsis*, *noētikos*, *nous*, meaning inner wisdom, subjective intellect or understanding) is a knowledge that is experienced directly which can incorporate sensations of transcendence or 'the ineffable' (that which cannot be put into words); experiences that defy explanation yet are *felt* and consequently *feel understood*.

4 I use 'haptic', 'haptically', 'haptical', 'hapticity', (from the Greek, *haptikos* and *haptesthai*, to grasp, sense, perceive, 'lay hold of'), in relation to the performing/perceiving sensual body, alongside tactile as the latter tends to connote only the surface quality of touch.

5 I am not arguing, per se, that (syn)aesthetic works in general, and immersive practice in particular, automatically *induce* synaesthesia, but instead am drawing attention to a quality of experience that exists in appreciation that the language of synaesthesia and accompanying research into the condition helps to articulate.

6 See Machon, (*Syn)aesthetic*, in particular pp. 13–24, for a more detailed explication.

7 See Richard E. Cytowic, *The Man Who Tasted Shapes*, London: Abacus, 1994, 2002. *Synesthesia: A Union of the Senses*, 2nd edn, Cambridge, MA: MIT Press, 2002; V. S. Ramachandran and E. M. Hubbard, 'Hearing Colors, Tasting Shapes', *Scientific American*, Vol. 288, Issue 5 (2003), pp. 52–9; Cretien van Campen, *The Hidden Sense: Synaesthesia in Art and Science*, Cambridge MA: MIT Press, 2008; Vincent Walsh and Catherine Mulvenna, 'Synaesthesia: Supernormal Integration?' *Trends in Cognitive Sciences*, Vol. 10, No. 8, (2006), pp. 350–2; Walsh et al., 'Synaesthesia: Learned or Lost?', *Developmental Science*, Vol. 12 (2009), pp. 484–91.

8 Cytowic, *The Man Who*, p. 8.

9 Ramachandran, 'Hearing Colours', p. 58.

10 Walsh and Mulvenna, *op cit*., p. 350.

11 Cytowic, *The Man Who*, pp. 76–7; *Synasthesia*, pp. 67–70.

12 Cytowic, *The Man Who*, pp. 78, 121, 229, 92, 167, 7, 14.

13 A. R. Luria, *The Mind of a Mnemonist: a little book about a vast memory*, New York: Cape, 1969, pp. 77, 138, 144, 96.

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14 Cytowic, *The Man Who*, p. 119

15 Luria, *Mind*, p. 133.

16 See Cytowic, *Synasthesia*, pp. 100–2, 132 and van Campen, *op. cit*., pp. 103–14.

17 Cytowic, *Synasthesia*, pp. 167, 92.

18 Elaine Scarry, *The Body In Pain: The Making and Unmaking of the World*. New York and Oxford: Oxford University Press, 1985, p. 197.

19 Cytowic, *The Man Who*, p. 229. Walsh also highlights ideas around the 'a-ha' moment of artistic creativity and experience as his 'Neuroscience and Creativity' TEDx video archive documents.

20 This idea develops on a tactile and haptic level Peter Brook's idea of performance work which makes 'the invisible visible' (*The Empty Space*, Harmondsworth: Penguin, 1968, p. 47).

21 Machon, *(Syn)aesthetics*, pp. 54–81.

22 In Machon, *Immersive*, pp. 175–6.

23 *Ibid*.

24 *Ibid*., emphasis added.

25 *Ibid*., pp. 176–7.

26 *Ibid*., p. 177.

27 *Ibid*., p. 180.

28 *Ibid*.

29 *Ibid*., p. 175.

Chapter 11

1 Maaike, Bleeker, *Visuality in the Theatre: The Locus of Looking*, Basingstoke: Palgrave Macmillan, 2008, p. 18.

2 Liesbeth Groot Nibbelink, 'Radical Intimacy: Ontroerend Goed Meets the Emancipated Spectator', *Contemporary Theatre Review*, Vol. 22, No. 3 (2012), p. 413.

3 C. P Snow, 'The Two Cultures', *Leonardo*, Vol. 23, No. 2/3 (1990), p. 169.

4 *Ibid*., p. 173.

5 In the United Kingdom, at least, the educational system is being significantly influenced by the Research Excellence Framework (REF). The REF is intended as a measure of academic quality in UK higher education institutions (HEI) and attempts to justify public funding in the public interest. At the time of writing, the REF will form the basis of HEI funding decisions following completion in 2014. For the humanities, research results can be difficult to quantify. While the REF may be regarded as an opportunity for humanities subjects to make more use of evidence led-enquiry, it might also be interpreted as a threat to a well-established and valuable set of working practices that are not governed by measurable outcomes.

6 Joseph LeDoux, *The Emotional Brain: The Mysterious Underpinnings of Emotional Life*, London: Phoenix, 1998, p. 291.

7 Carl Plantinga,, *Moving Viewers: American Film and the Spectator's Experience*, Berkeley: University of California Press, 2009, p. 57.

8 *Ibid*.

9 George Lakoff and Mark Johnson, *Philosophy in the Flesh: The Embodied Mind and its Challenge to Western Thought*, New York: Basic Books, 1999, p.11.

10 LeDoux, *op. cit*., p. 29.

11 Plantinga, *op. cit*., p. 57.

12 Arnold, *op. cit*., p. 178.

13 Mark Johnson, *The Meaning of the Body: Aesthetics of Human Understanding*, Chicago IL: University of Chicago Press, 2007, pp. 60–1.

14 Lakoff and Johnson, *op. cit*., pp. 37–38.

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15 M. B. Arnold and J. A. Gasson, 'Feelings and Emotions as Dynamic Factors in Personality Integration' in Magda B. Arnold (ed.), *The Nature of Emotion: Selected Readings*, Harmondsworth: Penguin Books, 1968, p. 203, original emphasis.

16 Magda B. Arnold, 'Perennial Problems in the Field of Emotion' in Magda B. Arnold (ed.), *Feelings and Emotions: The Loyola Symposium*, New York: Academic Press, 1970, p. 176.

17 Antonio Damasio, *The Feeling of What Happens: Body and Emotion in the Making of Consciousness*, New York: Harcourt Brace and Company, 1999, p. 51. See also Ekman, Friesen and Ellsworth, p. 64.

18 Damasio, *op. cit*., p. 51. See also pp. 54–7.

19 Bruce McConachie, *Engaging Audiences: A Cognitive Approach to Spectating in the Theatre*, New York: Palgrave Macmillan, 2008, p. 4.

20 Arnold, *op. cit*., p. 174.

21 This underscoring of the role played by cognitive processes is perhaps what distinguishes Arnold's notion of affective memory from Machon's account of corporeal memory also explored in this volume.

22 Susan Bennett, *Theatre Audiences: A Theory of Production and Reception*, second edition, London: Routledge, 1997, p. 98.

23 Johnson, *op cit*., p. ix.

24 For more on plunging into the darkness in theatre, see Martin Welton, *Feeling Theatre*, Basingstoke: Palgrave Macmillan, 2012, p. 63.

25 Paul Slovic, 'Introduction and Overview' in Paul Slovic (ed.), *The Perception of Risk*, London: Earthscan, 2000, p. xxii.

26 Ortwin Renn and Bernd Rohrmann, 'Risk Perception Research: An Introduction' in Ortwin Renn and Bernd Rohrmann (eds), *Cross-Cultural Risk Perception: A Survey of Empirical Studies*, London: Kluwer Academic Publishers, 2000, p. 13.

27 Brian Massumi, *Parables for the Virtual: Movement, Affect, Sensation*, Durham: Duke University Press, 2002, pp. 57–8.

28 Damasio, *op. cit*., p. 41.

29 Ortwin Renn and Bernd Rohrmann, 'Cross-Cultural Risk Perception: State and Challenges' in Ortwin Renn and Bernd Rohrmann (eds), *Cross-Cultural Risk Perception: A Survey of Empirical Studies*, London: Kluwer Academic Publishers, 2000, p. 221. See also Slovic, 'Introduction', pp. xxxi–xxxii.

30 Justin L Barrett, 'Gods' in Harvey Whitehouse and James Laidlaw (eds), *Religion, Anthropology and Cognitive Science*, Durham: Carolina Academic Press, 2007, p. 189.

31 *Ibid*.

32 Liesbeth Groot Nibbelink usefully observes: 'I think it is remarkable that Rancière's distribution of the sensible hardly pays attention to the possibility of corporeal intelligence: knowledge that is present in affects and sensations', Groot Nibbelink, p. 418, original emphasis.

Chapter 12

1 'GOFAI' (or Good Old Fashioned Artificial Intelligence) was first coined by John Haugeland and is a widespread term for artificial intelligence. See John Haugeland, *Artificial Intelligence: The Very Idea*, Cambridge, MA: MIT Press, 1985.

2 See Chris Sinha, 'Blending out the background: Play, Props and Staging in the Material World', *Journal of Pragmatics*, Vol. 37 (2005), pp. 1537–54, 1540–1.

3 Jordan Zlatev, Timothy Racine, Chris Sinha and Esa Itkonen, 'Intersubjectivity: What Makes us Human?' in Jordan Zlatov, Timothy Racine, Chris Sinha and Esa Itkonen (eds), *The Shared Mind: Perspectives on Intersubjectivity*, Amsterdam and Philadelphia: John Benjamins Publishing Company, 2008, pp. 1–38, 1.

4 See Evan Thompson, 'Empathy and Consciousness' in Evan Thompson (ed.), *Between Ourselves: Second-Person Issues in the Study of Consciousness*, Thorveton: Imprint Academic, 2001, pp. 1–32, 2.

5 There is a spectrum of impairments in autism and each child moreover is on their own unique spectrum with differing degrees of difference. See Lorna Wing, *The Autistic Spectrum, A Guide for Parents and Professionals*, London: Constable, 1996.

6 Imagining Autism: Drama, Performance and Intermediality as Interventions for Autistic Spectrum Conditions (October 2010–April 2014) is an AHRC (Arts and Humanities Research Council) funded project that hopes to establish the efficacy in cognitive

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development terms of applied theatre work with autistic children: the work is subject to a range of quantitative and qualitative measures by psychologists. The Principal Investigator is Professor Nicola Shaughnessy, and Co-Investigators are Dr Melissa Trimingham, Dr Julie Beadle-Brown and Dr David Wilkinson, all University of Kent. See Nicola Shaughnessy, 'Knowing Me, Knowing You: Autism, Kinesthetic Empathy and Applied Performance' in Dee Reynolds and Matthew Reason (eds), *Kinesthetic Empathy in Creative and Cultural Practices*, Bristol: Intellect, 2012, pp. 33–50.

7 See Evelyn Tribble, this volume.

8 The phrase is taken from Jerome Bruner, *Acts of Meaning*, Cambridge, MA and London: Harvard University Press, 1990.

9 Francisco. J. Varela, Evan Thompson and Eleanor Rosch, *The Embodied Mind: Cognitive Science and Human Experience*, Cambridge MA: The MIT Press, 1991. However a cognitive approach to objects has recently been explored within performance contexts by Teemu Paavolainen, *Theatre/Ecology/Cognition: Theorizing Performer-Object Interaction in Grotowski, Kantor, and Meyerhold*, New York: Palgrave Macmillan, 2012.

10 Gilles Fauconnier and Mark Turner, *The Way We Think: Conceptual Blending and the Mind's Hidden Complexities*, New York: Basic Books, 2002.

11 Sinha (2005), *op. cit*., p. 1357.

12 See Chris Sinha, *Language and Representation: A Socio-Naturalistic Approach to Human Development*, New York, London, Toronto, Sydney and Tokyo: Harvester Wheatsheaf, 1988, pp. 92–8 and Sinha (2005), p. 1539.

13 Cintia Rodrĩguez, and Moro Christiane, 'Coming to Agreement: Object use by Infants and Adults' in Zlatov, Racine, Sinha and Itkonen, *Shared Mind*, p. 92.

14 Chris Sinha, 'Objects in a Storied World: Materiality, Normativity, Narrativity', *Journal of Consciousness Studies: Controversies in Science and the Humanities*, Vol. 16, Parts 6–8 (2009), pp. 167–90, 177.

15 The phrase comes from Sinha, *ibid*. Folk psychology is most commonly rejected by neuroscience. See Andy Clark, *Mindware, An Introduction to the Philosophy of Cognitive Science*, Oxford: Oxford University Press, 2001, pp. 44–5.

16 Some confusion and controversy surrounds these terms, and this claim. See Philip Robbins, and Murat Aydede, 'A Short Primer on Situated Cognition' in Philip Robbins and Murat Aydede (eds), *The Cambridge Handbook of Situated Cognition*, Cambridge: Cambridge University Press, 2009, pp. 3–10 for an attempt at clarification.

17 Edwin Hutchins, *Cognition in the Wild*, Cambridge, MA, London: MIT Press, 1995. See also Hutchins, 'Material Anchors for Conceptual Blends', *Journal of Pragmatics*, 27, 2005, pp. 1555–77.

18 Distributed cognition can also be seen at work in the team of facilitators and performers in Imagining Autism when responding to and with the children in performance. It is not however a model of thinking that operates continually and to the exclusion of all other types: see Gavriel Salomon, 'No Distribution Without Individual's Cognition: A Dynamic Interactional View' in Gavriel Salomon (ed.), *Distributed Cognition: Psychological and Educational Considerations*, Cambridge: Cambridge University Press, 1993, pp. 111–38.

19 This certainly is achieved at times, most commonly with the higher functioning children we work with.

20 See note 16. 'Situated cognition' is here used, as Robbins and Aydede suggest, as a 'genus' term under which other types of cognition might fall.

21 My analysis of the intersubjectivity in the use of objects between autistic children is not intended to comment upon neurotypical cognitive development in young children or babies as this is beyond my remit and expertise. However my account is undoubtedly couched in terms of the 'intersubjectivity' theory of gradual cognitive development espoused by Michael Tomasello, Shaun Gallagher, Evan Thompson and others (Michael Tomasello, *The Cultural Origins of Human Cognition*, Cambridge Mass: Harvard University Press, 1999; Gallagher, Shaun and Daniel D. Hutto, 'Understanding others through primary interaction and narrative practice' in Zlatev, Racine, Sinha and Itkonen, pp. 17–138; and Thompson, Evan (ed.), *op. cit*. (2001) This is in contrast to the 'Theory of Mind' espoused by Simon Baron-Cohen, in for example Simon Baron-Cohen, A. M. Leslie and U. Frith, 'Does the autistic child have a "theory of mind"?', *Cognition* 21, (1985), pp. 37–46 and Simon Baron-Cohen,, 'From Attention-Goal Psychology to Belief-Desire Psychology: The Development of a Theory of Mind, and its Dysfunction' in Simon Baron-Cohen, Helen Tager-

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Flusberg and Donald Cohen, *Understanding Other Minds: Perspectives from Autism*, Oxford, New York and Tokyo" Oxford University Press, 1993, pp. 59–82. The so-called 'theory-theory' version of Theory of Mind is individualist and mentalist in that it stresses the child acquiring the ability to read the minds of others at approximately four years old by being able to reason behaviour out, using folk psychology as 'causal explanatory generalisations' (Thompson, p. 11). The model I pursue in contrast is basically processual, gradual, and hard to subject to scientific method of experiment and proof; as a result it has met a wary reception from some psychologists. See Peter Hobson and Jessica A. Hobson,'Engaging, sharing, knowing: Some lessons from research in autism' in Zlatev, Racine, Sinha and Itkonen, pp. 67–88.

22 Sinha (2009), *op. cit*., p. 168.

23 Bruner, *op. cit*., p. 35.

24 Sinha (2009), *op. cit*., p. 168.

25 See Sinha's experiments observing very young children using objects showing preference for 'canonicality effects' (i.e. normative use as opposed to brute affordances offered): Sinha (2009), *op cit*., pp. 178–81.

26 Fauconnier and Turner point out that 'The child plays with money, toy watches, and books, long before having the concepts of buying, telling time, and reading' (Fauconnier and Turner, *op cit*., p. 215).

27 See Paavolainen, *op cit*., pp. 29–37.

28 James Gibson, The Ecological Approach to Visual Perception, Boston: Houg Mifflin, 1979, p. 127.

29 Michael Tomasello, *The Cultural Origins of Human Cognition*, Cambridge, MA: Harvard University Press, 1999, pp. 84–5.

30 Gibson, *op. cit*., p. 128.

31 Tomasello, *op. cit*., pp. 84–5.

32 Sensory rooms in special schools, used by teachers and carers as calming places to comfort an autistic child, only offer of course these simple affordances.

33 These stages are taken from footage of the project (in St Nicholas School, Canterbury) but also informed by my notes at the time.

34 Tomasello, *op. cit*., p. 14.

35 *Ibid*., p. 7.

36 *Ibid*., pp. 56–93 and Thompson *op. cit*., p. 2.

37 Baron-Cohen, Leslie and Frith, *op. cit*., pp. 37–46.

38 Gallagher and Hutto, *op cit*., pp. 20–3; see note 19.

39 Olga Bogdashina, *Sensory Perceptual Issues in Autism and Asperger Syndrome Different Sensory Experiences – Different Perceptual Worlds*, London: Jessica Kingsley, 2004.

40 This is embodied cognition: see George Lakoff and Mark Johnson, *The Embodied Mind and its Challenge to Western Thought*, New York: Basic Books, 1999. It is important to note that Lakoff and Johnson's work, although readily embraced by performance researchers such as myself, remains by no means universally accepted by cognitive scientists.

41 Lakoff and Johnson, *op. cit*., pp. 49–54.

42 See for example Chris Sinha and Kristine Jensen de López, 'Language, Culture and the embodiment of social cognition', *Cognitive Linguistics*, Vol. 11 (2000), pp. 17–41, 20.

43 This is a feature we often noticed in autistic children with limited social skills: when they appear to want to engage but do not know how to do so, they resort to hitting or throwing things.

44 Before getting out, Joseph continued to spend a happy time in his bin observing the scene spread out before him closely, and securely, as the action moved away from him and developed elsewhere.

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