

Institution: University of Edinburgh		
Unit of Assessment: UoA29 (Classics)		
Title of case study: Introducing Distributed Cognition to New Audiences		
Period when the underpinning research was undertaken: 2014 – 2020		
Details of staff conducting the underpinning research from the submitting unit:		
Name(s):	Role(s) (e.g. job title):	Period(s) employed by submitting HEI:
Professor Douglas Cairns	Professor of Classics	2004 – present
Dr Miranda Anderson	Research Fellow	February 2014 - February 2018 (then Honorary Fellow until present)
Period when the claimed impact occurred: 2016 – December 2020		
Is this case study continued from a case study submitted in 2014? No		
1. Summary of the impact		
<p>Cairns and Anderson's pioneering research on distributed cognition in the arts and humanities has enhanced public understanding of the concept of the extended mind, and has influenced curatorial practices in the context of museums and art galleries.</p> <p>In collaboration with National Museums of Scotland and the Talbot Rice Gallery, Cairns and Andersons' research has:</p> <ul style="list-style-type: none"> • changed curators' thinking about the role of galleries and museums in human cognition; • shifted public perceptions of historical artefacts; • engaged new and diverse audiences with the question of distributed cognition and the cognitive benefits of art – including schoolchildren, artists and people affected by homelessness and by economic and educational deprivation. 		
2. Underpinning research		
<p>Between 2014 and 2018, Cairns and Anderson carried out a series of projects on the history of the 'extended mind' and distributed cognition. The notion of distributed cognition had been developed by UoE Philosophers, to denote the ways in which thinking is distributed between the body and the world, with the brain making extensive use of objects and interactions to extend cognitive capacity. Through an extensive body of work, including the £478,000 AHRC-funded History of Distributed Cognition (HDC) project, Anderson and Cairns traced the history of ideas of distributed cognition from Antiquity to the twentieth century.</p> <p>Anderson's monograph <i>The Renaissance Extended Mind</i> showed how ideas and practices of extended cognition were widely evident in another historical period. It examines current notions of the mind as embodied, embedded, enactive and extended; considers their relation to current literary and cultural methodologies; and explores parallels (and contrasts) with cognitive practices and ideas about the mind in Renaissance scientific, philosophical, literary and other cultural texts [3.1].</p> <p>Cairns's work on embodiment, conceptual metaphor theory, and emotion was an integral aspect of HDC research throughout. His 2017 paper compares how two very different dramatisations of the same myth, in Euripides and Seneca, represent the embodied, embedded, social and enactive nature of emotion [3.2]. It demonstrates especially how metaphors based on the body and its interactions with the environment convey emotion. A parallel piece shows how Euripides' <i>Hippolytus</i> makes use of a proto-enactivist model of cognition as an active process based on embodied interaction with and sensorimotor feedback from the environment</p>		

to dramatise the phenomenology of shame and conscience as socially embedded phenomena [3.3].

Anderson and Cairns extended this research through a major collaborative project within HDC, which brought together more than 60 scholars from 13 countries and diverse disciplines. Using guidelines developed by Anderson, they applied contemporary models of distributed cognition from philosophy of mind and cognitive science to historical, cultural and literary works from antiquity to the mid-twentieth century to demonstrate how these artefacts support and extend our cognitive abilities. Between 2018 and 2020, they published the project's findings in a four-volume series entitled *The Edinburgh History of Distributed Cognition*, providing new insights for philosophy of mind and cognitive science. Key insights further developed through this collaboration included:

- the role of contemporary distributed cognition theory in creating a scientific basis to understand the fundamental significance of culture to humans and the humanities. First developed in Anderson's book on the Renaissance [3.1], these ideas were articulated in the introduction provided for contributing authors by the HDC project's seminars and workshops [3.4].

- the extent to which/ways in which distributed cognition was explicitly or implicitly evident in Greek and Roman life and thought from the 8th century BC to 6th century AD. In an introduction that built on his AHRC-funded and previous research, Cairns elucidated the role and potential of distributed cognition in classical studies [3.5]. These ideas were developed through a series of 12 contributions by project collaborators, which were extensively shaped in workshops and written feedback led by Cairns.

- the extensive circulation and distinct expression of ideas and practices of distributed cognition in medieval and Renaissance culture. Building on her earlier work, this approach is articulated in Anderson's introduction, which examines the contribution of a distributed cognitive methodology to medieval and Renaissance studies [3.6]. These ideas were applied in a further series of 16 essays, that were shaped through workshops and written feedback led by Anderson.

All the above items underwent thorough peer-review.

3. References to the research

3.1. M. Anderson (2015). *The Renaissance Extended Mind*. New Directions in Philosophy and Cognitive Science Series. Palgrave Macmillan. ISBN 9781137412843 (Can be supplied by HEI on request)

3.2. D. Cairns (2017). Mind, metaphor and emotion in Euripides' *Hippolytus* and Seneca's *Phaedra*. In D. Cairns, & D. P. Nelis (Eds), *Seneca's Tragic Passions* (pp. 246-67). (*Maia*; Vol. 69, No. 2). Morcelliana. ISBN 9788837231576 (Can be supplied by HEI on request)

3.3. D. Cairns (2020). Phaedra's Fantasy Other: Phenomenology and the Enactive Mind in Euripides' *Hippolytus*. In M. Liatsi (Ed.), *Ethics in Ancient Greek Literature* (pp. 117–28). De Gruyter. <https://doi.org/10.1515/9783110699616-007>

3.4. M. Anderson, M. Wheeler & M. Sprevak (2018). Distributed cognition and the humanities. In M. Anderson, D. Cairns, & M. Sprevak (Eds), *Distributed Cognition in Classical Antiquity* (The Edinburgh History of Distributed Cognition; series introduction). Edinburgh University Press, 1-17. (Can be supplied by HEI on request)

3.5. M. Anderson, D. Cairns & M. Sprevak (Eds) (2018). *Distributed Cognition in Classical Antiquity*. (The Edinburgh History of Distributed Cognition; Vol. 1). Edinburgh University Press. Described in the *Journal of Hellenic Studies* (140 (2020) 270) as a 'fine volume' offering 'valuable new perspectives', and likely of particular use to scholars from STEM fields studying the classics. ISBN 9781474429771 (Can be supplied by HEI on request)

3.6. M. Anderson (2019). Distributed cognition in medieval and Renaissance studies. In M. Anderson & M. Wheeler (Eds), *Distributed Cognition in Medieval and Renaissance Culture* (pp. 18-43). (The Edinburgh History of Distributed Cognition; Vol. 2). Edinburgh University Press. <https://doi.org/10.11820/b9be4bc7-d2f3-4db8-a5e0-72dd310fa468> ISBN 9781474438131 (Can be supplied by HEI on request)

4. Details of the impact

Changing curators' thinking about the role of galleries and museums in human cognition and shifting public perception of historical artefacts

In October 2016, the HDC team collaborated with National Museums Scotland (NMS) to create a day-long event at the National Museum of Scotland in Edinburgh, based on HDC project research [3.1 – 3.6]. Led by Anderson, Cairns, Sprevak and Wheeler, *Thinking with Things* welcomed over 100 people for lectures and discussions on humans' historical use of objects as mind tools to extend their cognitive abilities [5.1a]. The audience were for the most part members of the general public, with attendance skewed more towards a young adult demographic than is usual for the Museum [5.1a]. The lectures, along with seminars and blogs, available online on the History of Distributed Cognition website, have received 36,432 visitors by 31 December 2020 [5.1b].

In a letter to Cairns in March 2017, the NMS Senior Curator of Science and Principal Curator of Technology noted that the event had led people to look at museums and their societal role in fresh ways:

'[It] raised questions about the nature and role of museums, newly suggesting to audiences that they are the home of tools that scaffold human cognition... The kinds of questions that were posed by audience members after the talks... suggested a shift in understanding of the extent and significance of the role that museums play in... hands-on enquiries as well as in the preservation of the artefacts... The audience raised questions that showed a change to prior assumptions about interactions with devices that may seem intuitive, such as mobile phones nowadays, but where there are often forms of culturally embedded knowledge, that mean such engagements are less straightforward than they might initially appear. The event was a reminder that part of the curators' role is to ensure they communicate such tacit knowledge as far as possible' [5.1c].

The success of *Thinking with Things* led the National Museum of Scotland to invite Cairns and Anderson to develop workshops for school pupils, exploring how humans have always used objects to think. Between March and May 2017, HDC project scholars hosted four workshops at NMS for more than 90 pupils aged 10 to 11 from primary schools in Fife, near Edinburgh. The children worked in groups to study objects from the Museum's collection, such as coins, chainmail and a tablet and stylus, and considered how they could be used to extend people's minds or bodies. Including games, a science and technology quiz, and a creative drawing exercise which encouraged the pupils to design a mind tool, the workshops were an opportunity for many of the children to visit the Museum for the first time.

In post-session questionnaires, pupils remarked that they learned 'there are many different ways of thinking, and tools can extend that' [5.2, p.37], 'even [...] your hands can extend your mind' [5.2, p.47], and 'how much technology affects our learning' [5.2, p.49]. Cairns and Anderson designed the events to align with the Curriculum for Excellence (Scotland's national curriculum) to ensure the transfer of learning back to the classroom. Teachers reported that their involvement changed their perspective and made them think 'of the technology shown as aids to extend our thinking' [5.2, p.27], and 'how the word 'technology' encompasses much more than we generally think it does' [5.2, p.28].

Engaging new and diverse audiences with the cognitive benefits of art

In 2019, Anderson and Cairns secured AHRC Follow-on funding to build on the engagement and impact of the HDC project's research [3.1 – 3.6] via contemporary art. In partnership with one of Scotland's leading visual art galleries, Talbot Rice Gallery (TRG), and 13 leading international artists (from, amongst other places, Austria, Greece, Poland, Northern Ireland, Japan, the Netherlands and the United States), they developed a contemporary art exhibition to present the idea of distributed cognition. *The Extended Mind* employed diverse mediums, including sculptures, video installations and performances, to explore how cognition is not brain-bound but instead extends across brain, body, and world, offering new ways of understanding the creation and experience of different art styles [5.3]. Tokyo-based mixed-media artist and winner of the prestigious Shiseido award 2010, Goro Murayama's work was a particularly strong example of

this, showing artist and artwork developing in tandem. 3,839 people attended the exhibition between 2 November 2019 and 1 February 2020 [5.4a]. It also received broad media coverage including *Art Review*, *The Times* ('mind-blowing') and *Studio International* ('fascinating and revelatory'; 'the complexity and beauty of everyday cognitive processes is revealed mesmerisingly... quite sublime'; 'an experimental and exciting endeavour, this show succeeds brilliantly') [5.4b-d].

The TRG's Curator noted that *The Extended Mind* was the first exhibition based on academic research to which it had ever committed and 'the first exhibition to result in the Talbot Rice Gallery receiving significant funding from an academic research funder' (AHRC). The research collaboration 'shaped all the major facets [of the exhibition], including [curatorial] decision making (with Miranda Anderson named as a third curator), approaches to communications (from volunteer inductions to exhibition guides) and a vibrant widening participation programme' [5.4a].

Anderson, Cairns, Sprevak and Wheeler also created 8 podcasts based on their research [3.1 - 3.6] for the exhibition's Round Room – the first time that the TRG had made use of audio material in this way. These podcasts have been made available on the Talbot Rice Gallery website. In a survey of 149 attendees, 80% said they had learned something from the exhibition about the extended mind. It offered 'a perspective on cognition that I haven't seen before', said one. It 'made me think about how thoughts may be represented in ways other than traditional art, writing, numbers', commented another [5.5, pp.16 & 19]. Close to half of survey respondents (47%) said the experience had changed the way they thought about the mind [5.5, p.15].

The Extended Mind engaged new and diverse groups of people. During the exhibition, Anderson, Sprevak and TRG staff hosted three workshops with eight and nine-year-old pupils from Edinburgh's Royal Mile Primary School. This included four activities based on the exhibition's artworks and a presentation by the pupils, exploring the theme of how we can extend our mind, for example through the body, writing and drawing. In post-event questionnaires it became clear that pupils had begun to appreciate how, in everyday life, they use their bodies and the external world to think. One cited 'art and singing' as examples of this. Others mentioned their hands, their use of pencils, beds and toilets; listening to music; even something as apparently simple as 'sitting down'. The children's teacher noted that the experience inspired her to be 'more cross-curricular [concerning] all the expressive arts' [5.6, p.11].

In partnership with TRG and the charity Crisis, Anderson and Cairns provided dedicated sessions for people affected by homelessness. They welcomed a group from Ragged University, which supports free peer-led learning in communities whose socio-economic circumstances make traditional education inaccessible. One attendee of the Crisis event commented that the workshops had helped her 'to see behind the artwork to the Artist's ideas, and also to consider the process of their production' [5.7]. A survey respondent from the Ragged University group commented: 'Have been interested in debates about supra-individualism in philosophy... but have never met the ideas materialised by artists. Very life-enhancing!' Another said: 'My mind and brain are racing, and this will take a long time to process!... Excellent, thank you!' [5.8a, pp. 5 & 8]. In a February 2020 letter, the Ragged University Coordinator wrote that the exhibition had helped him to 'think how I can search out elements of [university] education...in the...civic landscape'. It had 'inspired a sense of belonging and affection, which is much needed to deepen [broader public] ownership of the intellectual realm' [5.8b].

The Extended Mind led to a new partnership with Queen Margaret University's MSc Art Psychotherapy programme, through a workshop led by Anderson that was intended to give art therapy students fresh philosophical and neuroscientific angles on their work. Post-session feedback confirmed the fulfilment of this ambition. One student had been persuaded to reconsider 'the potential impact of artworks for a client group beyond aesthetics'; a second to reflect on how 'interventions inside galleries...could help children and adults get more engaged with art'. Two more said that they had become aware, respectively, of the body 'having a memory of its own and knowing what it wants to do or say before the mind does', and of 'know[ing] things before you are able to verbalize them'. Another student commented that she had 'never considered movements forming part of thinking before'. Finally, a number of respondents said that their understanding of the client-counsellor relationship had been changed [5.9]. The reconceptualization of physical environments as having cognitive dimensions

appeared to carry ethical implications for how clients are invited into the space in which the encounter with the counsellor takes place. In the words of one art therapy student:

'It has made me consider the difference and cross-overs between intervention and invitation – the control a therapist has over a therapeutic environment and the ways in which this control/autonomy can be handed back to the client'. [5.9, p.11]

Artists involved in the exhibition testified to the benefits they had received. Goro Murayama commented that where he had previously struggled to find ways of exhibiting his work – which stands at the intersection of science, philosophy and art – alongside other artists via a single shared curatorial theme, *The Extended Mind* had enabled him to do just this. It had also given him a model for creating the drawing workshops for autistic children which he had long hoped to establish [5.10a]. Marcus Coates (winner Merrill Lynch Award 2013; Venice Biennale 2007) concluded that the 'exhibition, the underlying research, and the conversations around the theoretical ideas with the academic team, opened up a whole new world for me, and [...] will influence how I will think in the future about the creative mind and my own artistic practice' [5.10b].

The TRG Curator found significant benefits for the gallery itself from the project. He personally found that his work on subsequent exhibitions had been enhanced by a new understanding of how 'artworks don't simply come from an artist's brain, but have to be worked out through time, via concrete media and through the body... [the] research behind distributed cognition validates and articulates this way of working, not as an artistic exception, but as a human necessity.' More broadly, the TRG was now becoming involved in creating 'more substantial children's workshops and supporting materials...[with] quantifiable outreach outcomes... build[ing] the Curriculum for Excellence... into its thinking around work with its key community partners' [5.4a].

5. Sources to corroborate the impact

5.1. NMS feedback:

- a) K. Stauber (15 March 2017). Thinking with Things: Considering the role of museums in human cognition. *National Museums Scotland*.
<https://blog.nms.ac.uk/2017/03/15/thinking-with-things-considering-the-role-of-museums-in-human-cognition/>
- b) Google metrics for *History of Distributed Cognition* website, 1 November 2014 to 31 December 2020.
- c) *Senior Curator of Science and former Principal Curator of Technology at NMS* (testimonial letter, 13 March 2017).

5.2. NMS collaboration, Fife student and teacher feedback forms, March and May 2017.

5.3. *The Extended Mind*. Talbot Rice Gallery. <https://www.trg.ed.ac.uk/exhibition/extended-mind>

5.4. *Talbot Rice Gallery* exhibition: visitors and wider reach.

- a) Curator. *Talbot Rice Gallery* (testimonial letter, 25 June 2020).
- b) M. Herbert (25 November 2019). Coming Up. *Art Review*.
- c) 'Week in pictures: Scotland'. *The Times*.
- d) C. Spens (9 December 2019). The Extended Mind. *Studio International*.

5.5. *Talbot Rice Gallery* Visitor Survey, February 2020.

5.6. *Royal Mile Primary School* event student and teacher feedback forms, November 2019.

5.7. Crisis event feedback.

5.8. *Ragged University* feedback:

- a) *Ragged University* feedback form.
- b) Co-ordinator. *Ragged University* (testimonial email, 25 February 2020).

5.9. *Queen Margaret University* MSc art therapy student feedback forms, February 2020.

5.10. Artists' Testimonials from Goro Murayama and Marcus Coates, July-September 2020.