

## **Intra-acted Signatures in Capoeira**

### ***More-Than-Human Pathways Towards Activism***

#### **Author's Names and Affiliations:**

Dr Beatrice Allegranti, Reader in Dance Movement Psychotherapy, University of Roehampton, London, Choreographer, UKCP Reg. Dance Movement Psychotherapist.

Dr Jonathan Silas, Senior Lecturer in Cognitive Neuroscience, Middlesex University.

#### **Corresponding Author:**

Beatrice Allegranti, Froebel College, University of Roehampton, London SW15 5PJ  
Email: [b.allegranti@roehampton](mailto:b.allegranti@roehampton)

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# **Embodied Signatures in Capoeira**

## ***More-Than-Human Pathways Towards Activism***

Beatrice Allegranti<sup>1</sup> and Jonathan Silas<sup>2</sup>

### **Abstract**

This paper is informed by interdisciplinary research, practice and activism (Allegranti and Silas 2014; 2016, 2017) combining dance movement psychotherapy, cognitive neuroscience and the Afro-Brazilian art of Capoeira. Framed by feminist new materialism and posthumanism (Manning 2013; Haraway 2012; Barad 2007), and as an antidote to our global crisis, this writing foregrounds conceptual and political discourses that work towards counterhegemonic understandings of bodies, affect, brain activity and relating. Here, we present case studies arising from our ‘Capoeira Lab’ a hybrid laboratory, dance studio and psychotherapeutic space that demonstrates more-than-humanism in action, and what happens when insights from psychotherapy, neuroscience and capoeira are read through one another. To paraphrase Barad (2007), we propose Intra-active Signatures: a distributed and dynamic process between bodies, technology and environments – typified by the capoeira exchange. This more-than-human focus dislocates the centrality of the human and the cognitive bias instead, yielding ecologically renewable and neurodiverse ways human-environment relating and enacting ethical change. Ripples of movement in relating evolve micro acts of activism.

**Keywords:** embodied signatures, activism, posthumanism, feminist new materialism, capoeira, dance movement psychotherapy, cognitive neuroscience.

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<sup>1</sup> University of Roehampton, London, UK.

<sup>2</sup> Middlesex University, London UK

## **Introduction**

We are interdisciplinary collaborators - researching bodies across the disciplinary boundaries of capoeira, dance movement psychotherapy (DMP) and cognitive neuroscience, having professional experience across all three fields. We share posthumanist and feminist new materialist values (Manning 2014; Harraway 2012; Barad 2007) about the ethics and politics of bodies relating and what we understand bodies to be. In doing so, we work towards a more-than-human understanding where biology, environment, technology, human and non/more-than-human bodies and forces are all given equal value in a constantly co-constitutive process. Our layered interdisciplinary action is a response to the current European rise of right-wing politics and racist immigration rhetoric, well evidenced in the recent U.K. withdrawal from the European Union<sup>3</sup>. The personal has never been so political and demanding urgent attention. NHS policies are also addressing 'health inequalities' where people from black, Asian or minority-ethnic communities have a higher incidence of mental health diagnosis, but also experience poor outcome from treatment and disengage from mainstream mental health services (Public Health England, 2017<sup>4</sup>). As such, this writing is a first step in proposing a more-than-human activism where an interdisciplinary understanding of the dynamism and complexity of embodiment in general and capoeira specifically - offers pathways for ethical relating.

## ***Moving Interdisciplinarity***

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<sup>3</sup> <https://www.gov.uk/government/publications/the-process-for-withdrawing-from-the-european-union>

<sup>4</sup> Public Health England:

[https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment\\_data/file/731682/Reducing\\_health\\_inequalities\\_system\\_scale\\_and\\_sustainability.pdf](https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/731682/Reducing_health_inequalities_system_scale_and_sustainability.pdf)

Our shared more-than-human understanding of embodiment challenges the Western hypercognitive model, instead emphasizing a complex, dynamic process that locates movement at the heart of behaviour, cognition, affect and environment (Author 1, 2019, 2020). Ideas of embodiment from cognitive neuroscience also emphasise the role of motor and somatosensory processing in cognition (Gallagher, 2011).

Arguably any interaction is embodied. In a trivial sense, moving bodies are required for any form of interaction, notwithstanding brain computer interfaces, motor output is required for any form of communication. However, in a less trivial sense, we adopt the view that cognition and interaction are reliant on movement and, that sensorimotor processing is not *only* related to generating movement. Indeed, as Wolpert (2011) argues our brains are for one purpose only: to produce adaptable and complex movements. That is to say, human brains are *for* movement and movement plays a central role in cognitive-affective relating.

Building on the ubiquity of movement, our focus on capoeira has assisted us in seeing the detail of human and more-than-human relating through movement improvisation strategies. Capoeira offers a direct example of the historicity of the Afro-Brazilian moving body since the form itself is shaped by the experiences of oppression and activism. A blend of martial art, dance and music, the form originated as a political and historical manifestation of resistance from African enslavement in late colonial Brazil. Diasporic capoeira is practiced globally in designated academies or schools across the world – in a reversal of the passage of the African slaves (Assunção 2005; Delamont et al., 2017). Arguably, capoeira, is a site for activism and, in this writing, we consider it as not only as counterhegemonic but also as an ecological practice: capoeira is a microcosm of society and environment and as such, always in flux. In doing so, we extend existing historical (Capoeira 2002, Lewis

1992, Almeida 1986), ethnographic (Delamont et al. 2017) anthropological (Assunção 2005, Downey, 2005), dance studies (O’Shea 2017; Rosa 2015) and neuroanthropological (Lende and Downey, 2012) research, since our more-than-human study of capoeira dislocates the centrality of the human and the cognitive bias, instead yielding ecologically renewable and neurodiverse ways of relating that work towards counterhegemonic understandings of bodies, affect and brain activity.

While it is important to espouse the virtues of interdisciplinary scholarship, especially when crossing artistic, psychotherapeutic and scientific fields, it is also necessary to acknowledge the difficulties, tensions and necessary compromises in such work that often remain unsaid. Cognitive neuroscience is fundamentally reductive in nature, in that it aims to explain mental phenomena by the study of their constitutive mechanisms and functional properties. By contrast, psychotherapy, for the most part, rejects a scientific methodology in favour of first-person accounts of experience and has a theoretical framework that is value laden. Both theoretically and methodologically these different approaches can be difficult to reconcile.

Experimental research requires careful control of possible confounding variables whereas psychotherapeutic and artistic research investigations seek ecological validity in the research space through attention to subjectivity and knowledge production via modality specific means. In a pure sense science is a-ideological, although as we hope to highlight in this writing, this is not the case in lived scientific practice since scientific authority can, often unintentionally, be appropriated to further ideological perspectives. As such, in our neurofeminist scholarship we have not sought to eliminate these tensions or disagreements but to work with them. More than this, our intent is to work with non-binary processes to help us navigate the (still-as-yet-unthought-and-unknown) more-than-human.

## The Capoeira Lab: an *intra*-active space



Photos: Alice Underwood

The Capoeira Lab arose out of our current research ‘Embodied Signatures’ (Author 1 and Author 2, 2014; 2016<sup>5</sup>) including the short films, *What Moves Us* (2014) and *Embodied Signatures* (2017). The research investigates our interdisciplinary: how we worked with DMP experiential process, the Afro-Brazilian art of capoeira and, electroencephalography (EEG) experiment.

Our tangled capoeira lab was layered with EEG measures, filming and photography, as well as meaning making through experiential movement and discussion - exemplified by DMP practice. Our aim was for each aspect to capture the performance and observation of capoeira in rotating triads: two participants played

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<sup>5</sup> Public engagement online event with Author 1.

capoeira whilst the third observed with an EEG measurement. The meaning making discussion followed each triadic exchange.

EEG is a form of non-invasive brain imaging; electrodes, in the form of small metal disks are placed on the surface of an individual's scalp. These passive electrodes simply pick up ongoing electrical activity that is generated by the brain and reflect ongoing neurological and cognitive processes. Previous research has reliably shown that a change in ongoing electrical rhythms measured from the scalp can be linked to perceptual, cognitive, affective and sensorimotor psychological processes. For our current purposes it is sufficient to explain that EEG provides a measure of brain activity which can be related to key conceptual issues we outline here: relating between affect, bodies and the environment.

The first phase of our *Embodied Signatures* research took place over the period of nine months (Oct 2015 – June 2016) and participants were recruited internationally from Mojuba Capoeira Group London – where I (Author 1) have trained with Mojuba's leader and teacher, Mestre Poncianinho for eighteen years. A variety of Masters of capoeira who are affiliated with Mojuba and from North East and Central Brazil<sup>6</sup> were also included in the study. The interdisciplinary nature of this research investigation led to us to create a material environment that influenced some of the conditions of the research. Our experimental space was neither fully a laboratory, nor

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<sup>6</sup> The group of participants (N = 36) recruited for this study comprised capoeira practitioners with varying experience of the form: (i) senior masters with more than 30 years of experience across a range of capoeira lineages; (ii) a culturally and gendered mixed group of practitioners of varying ages and with at least 10 years of experience and; (iii) a culturally and gendered mixed group of varying ages with up to two years of experience of the form. This sample allowed us to compare levels of embodied experience across participants.

a capoeira/dance studio space nor a psychotherapy space and yet, it was all. The carpeted room was large enough for movement exchange but a space where we could feel the proximity and heat of moving bodies. The conspicuously incongruent university institutional carpet also seemed to draw direct attention to how the movers used the falling and catching rhythms prevalent in capoeira - to their engagement with the floor as a 'holding' partner. Through our ecological shifts we created a space adorned with portable EEG equipment, computer and capoeira instruments. The juxtaposition of the Brazilian flag with brain imaging equipment created an 'in-between' space of words, numbers, cultures, technology and moving bodies – all this became 'data' that was 'troubling', incomplete, partial (Jackson and Mazzei, 2012) and yet, a powerful reminder of how we are *within* and *part of* human and non/more-than-human relating. Karen Barad speaks of this mutually constitutive process of being *within* and as *part of* the world rather than the more familiar use of inter-action of separate entities, by creating the neologism '*intra-action*',

[T]he notion of *intra-action* recognizes that distinct agencies do not precede, but rather emerge through, their intra-action [...] individuals do not pre-exist their interactions; rather individuals emerge through and as part of their entangled intra-relating (2007, 33).

*Intra-activity* places the focus of attention not on the human but on the phenomena generated when different forms of matter are brought together, for example, words, text, technology and moving bodies. Our attention to *Embodied Signatures* in this writing reminds us of the tensions in our interdisciplinary approach and goes some way towards facilitating the understanding of our methodological stance where



neither language, technology, affect, nor bodies are prioritised but all ‘*intra-act*’ (Barad, 2007).

Whilst we have taken brain signatures we choose not to present them here.

Specifically, EEG measurements were taken for the purposes of measuring the change in amplitude of the so-called ‘mu’ rhythm. This is an electrical frequency (approximately 8-10 Hz) generated by sensorimotor regions in the brain that has been found to respond to movement – both performed and observed (Pineda, 2005). The functional role of any brain signature that displays similar properties during both action observation as it does during action performance has been strongly linked to embodied cognition. Embodied cognition, in cognitive science, has been linked to a host of interpersonal functions and the mu rhythm has been used to infer and quantify these. We find commonality here in the scientific consideration of embodied cognition with intra-action. However, critically, we recognize here that the approach of pseudo-objectivization of intra-acting that is performed implicitly by the sciences is problematic. We choose here to focus on the discursive aspect of our investigation rather than present, alongside our considerations, brain data.

### ***Somaticscience* Tangling**



Photos: Alice Underwood

Embodying the more-than-human within our research process, can be seen as ‘material-discursive’ (Jackson and Mazzei 2012): an ongoing constitution of privileging neither language and meaning making systems nor bodies, in oppositional hierarchy. The hyphenated concept of material-discursive brings to the fore how language, meaning making systems and (human and non/more-than human) bodies are not in oppositional hierarchy but *intra-acting*. This way, language (in all its political non neutrality) does not need to be understood in simply discursive terms, but materially too. Language is the product of material flows and Barad explains the politics of discourse as not what is said in terms of linguistic or speech acts but that discourse is, 'that which constraints and enables what can be said. Discursive practices define what counts as meaningful statements' (Barad 2007, 146).

Holding the material-discursive tension in our collaboration supports us in acknowledging the power struggle in science and in society at large around ‘who gets to set the terms of debate’ (Lather, 2016: 637). Hence, we engage with current feminist concerns about philosophy of science and science as the perceived ‘authority’ (Haraway, 2008) and, suggest that DMP and cognitive neuroscience are, in Barad's terms ‘entangled’ in as much as they lack an independent (a priori) existence (Barad, 2007) and are, in Erin Manning's terms, 'always more than one' (2013). This leaking beyond discrete disciplinary boundaries is central to what can be described as our *somaticscience* collaboration and concomitant with the re-imagining of what science, art and psychotherapy can be.

We further enter the feminist-science philosophical debate and argue that brain data alone is not enough. Whilst research in cognitive neuroscience is aware that brain data need to be correlated with behaviour we argue that neuroimaging data must be

*already* located within wider interdisciplinary understanding of bodies relating. Also, whilst we are attentive to Lather's call to be 'sensitive to issues of social justice' (2016: 637) we extend this awareness to the wider reaching issues that our research raises: knowing and being or 'onto-epistemological' (Barad, 2007) aspects of our *somaticscience* collaboration, as well as, the ethics and politics (and power) of knowledge production in researching moving-dancing human and more-than-human bodies and environments.

In Many respects the tension and leaking between the disciplinary boundaries can be considered in the context of Cartesian duality. That is to say, somatoscience is often positioned as a critical approach to the long held implicit assumptions of cognitive science; that the body serves simply to mediate information that is passed to the central nervous system (Varela & Thompson, 1993). More recent critiques within the cognitive sciences have focused on the discussion of the bodies role beyond a mediator and the location of the mind extending outside of the brain (e.g., Chemero, 2011; Clarke, 2008). Whilst we position ourselves in alignment with this critical approach to the cognitive sciences, we extend our critical approach to something more than a formal analysis of 'mind stuff' (c.f., Clifford, 1878). Rather, a feminist and more-than-human approach positions our critique such that it is value laden and brings with it a call to action.

### **The *Kin*-aesthetics of Knowing**

In this writing, we sought to 'diffract' (Jackson and Mazzei, 2012; Barad, 2007) insights from DMP, cognitive neuroscience and capoeira through one another whilst presupposing no objectivity and acknowledging, as Barad (2007) has it, our 'onto-epistemological' biases. Materializing the 'data' in this way opened a space for us to begin to extend human development and psychoanalytic understandings of

intersubjectivity as shared affective experience and the evolving capacity to be witness to and, engaging in relating (Stern, 2010, Beebe et al 2005). Specifically, we argue for the role that *kin*-aesthesia plays in human and non/more-than human relating.

Drawing from dance and dance movement psychotherapy, the neologism '*kin*-aesthesia' includes three imbricated aspects: the sense of movement (including proprioceptive and interoceptive aspects); the vital role of the aesthetic process in forming movement (in both artistic and everyday life contexts) and; the emergent material kinship - and ethics and politics therein - during the process of movement relating (Author 1, 2019, 2020). Adding to this, within the brain, the so-called 'mirror mechanisms' are where information about human and more-than human others is processed in a neural and cognitive system that is typically used for dealing with information about the 'self'. Research in cognitive neuroscience has shown that cells involved in generating movements are also active during the observation of others. In effect, these mechanisms tangle: they allow us to process information about others 'as-if' the information was about 'self'.

A further crucial layer to *kin*-aesthetic relating is the recognition that our moving bodies are never neutral and that (bio-psycho-social) layers of gender, sex, sexuality, class, race, ethnicity, dis/ability, size, age, home/place/space, - our 'body politics' - are ever present and visible. As such, our aim is to contribute to the emerging field of neurofeminism that has yet to consider the more-than-human and, we contribute to emerging embodied theories in neuroscience which have yet to address the complexity of body politics. Body politics are largely excluded by a cognitive neuroscientific perspective – even when the body is central to theoretical approaches

(e.g., Damasio 1999; Uithol and Gallese 2015). Our process of *kin*-aesthetic knowing is thus what Boaventura de Sousa Santos (2018) states as an attempt to decolonise the 'cognitive empire'. In doing so we have sought to re-instate epistemologies of the Global South that are historically rooted in resistance to and destabilisation of capitalism, colonialism and patriarchy. For the Global South, the epistemological value resides in not distinguishing between embodied ways of knowing, ethics and politics (2018: 91). Our aim therefore, is to expand ways of understanding *how* knowledge is produced through an imbricated *kin*-aesthetic process.

In the writing that follows, we sought to 'diffract' (Barad 2007) by reading insights from the capoeira lab through one another. By writing with/in research participants' experiential discussions following observation and performance of capoeira, along with DMP and neuroscientific discourses, we attempt forge pathways of incipient activism and demonstrate the co-constituted nature of relating with human and more-than-human others.

### **Through Capoeira, I Became Black**

Capoeira plays an important global role in terms of recognising the dynamic specificity of identities as it has spread from Brazil in the 1990s, not only geographically, but in terms of body politics: it is a field where issues of race, class and gender are played out and potentially renegotiated (Assunção 2005). As such, capoeira offers a counter hegemonic practice and yet, it remains male dominated with women emerging as *mestras*<sup>7</sup> in the latter part of the twentieth century.

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<sup>7</sup>*mestre*: Translated as "master," as per martial practices that cultivate a relationship of master as teacher and mentor. Given the gendered bias of latin languages the feminization of the term is *mestra*.

During an interview, Beatrice asked Mestra Janja, the seminal capoeira *Mestra* and feminist scholar, about these complex layers of body politics in capoeira. Mestra Janja's words are rooted in the culturally, geographically and temporally specific experiences of her practice in the North East of Brazil,



Mestra Janja. Photo: Neil Emmanuel

We need to understand what this is, what is to be a capoeirista. I don't understand, for example, that I have given my life to capoeira and to not contest the dominating values in my society.

I don't understand how that can be.

[S]o capoeira really changed my destiny [...]

[T]hrough capoeira I became black, through capoeira I understood the possibility of acting politically in different worlds that don't use the traditional model of making politics.

Mestra Janja, is speaking as one of the first visible capoeira *Mestra's* from a mixed race heritage: a paradox of in-betweeness where racism can be experienced in both black and white groups. We are struck by Mestra Janja's repeated emphasis on the

adjective: *'through'*, suggesting that the very practice of 'undoing' and 'redoing' identities through movement (Author 1, 2011) offers a way of *'acting politically'*. Here, Mestra Janja articulates how the *kin*-aesthetics of capoeira is the interlocutor for the politics of everyday life: *'becoming black'* is an affirmative and, counter-hegemonic assertion. To paraphrase bell hooks<sup>8</sup> (1995), Mestra Janja's words highlight how capoeira is an act transgression since it requires moving past boundaries, it is, a *return* to the non-neutrality of the body.

The non-neutrality of our bodies is a subtle phenomenon - one that can be taken for granted particularly within a white hegemony. In everyday life we perform ourselves to ourselves and each other in an infinite variety of ways and, the dynamic specificity of this is evident during the capoeira exchange. A crucial (and often taken for granted) aspect of embodiment is 'body politics' (Author 1, 2011). Our bodies are never neutral and our unique intersecting signatures of gender, race, ethnicity, sex, sexuality, class, dis/ability, age, home/space/place, technologies - our 'body politics' – are ever present, in/visible and impact on our daily lives and social practices and affect (in all senses) different layers power and privilege with human and more-than-human others (Author 1, 2019). The conceptual framework of body politics builds on African-American feminist, Kimberlé Crenshaw's (1989) seminal view of intersectionality particularly highlighting the complexity and simultaneity of social and cultural patterns of oppression and, the invisibility of black women in white feminist theory.

Crenshaw's attention to the intersectionality of all forms of oppression prompts us to further consider how more-than-human processes are manifest in our daily movement

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<sup>8</sup> bell hooks uses unconventional lower case spelling for her name.

interactions. Since the moving body is the focus of our concerns, we view the intersectionality of oppression as fundamentally embodied. During the Capoeira Lab, both Athena and Matteo, from white European heritages, speak to their own embodied experiences of these intersections, where the body politics of race seem to be invisible and the problematisation of gender becomes prominent,

Athena: When I play with some men...you feel like you're shrinking and you feel like you're being put in the position of a little girl, and just like you know: 'I'm going to be nice with you because you can't do too much'.  
I hate that *feeling*.  
I really hate that when it happens.

Matteo: When I started capoeira I was carrying round all this useless stuff to do with coming from a small town in the East Midlands and having all of these notions of how a man 'should' be. And how they didn't really fit in with something like capoeira where you play music and it verges on dancing and stuff like that.

And it took me ages to let all of that go.

I *felt* capoeira in me straight away. It was something I really wanted, I needed.



Layers of gender oppression are evident for both Athena and Matteo. Athena points to the power imbalance of *'being put in a position of a little girl'* and Matteo names and questions the *'useless'* nature of coming from a particular geo-cultural space/place that enforces *'notions of how a man should be'*. Thus problematizing the implicit, and unquestioned default of hegemonic maleness.

Like Athena and Matteo, I (Author 1) have embodied this Afro-Brazilian aesthetic in a multi cultural urban context (in London and Brazil) and, my experience as a white, European woman, practitioner and now teacher of the form, is that capoeira opens up embodied spaces for potential renegotiation and transformation of social in/justices that cascade from the practice - into everyday life. Through the capoeira *kin*-aesthetic I am afforded opportunities to simultaneously negotiate layers of my own white privilege and move in the skin of another world – an endeavour that requires assiduous practice and constant, at times uncomfortable critical engagement. And yet, at times, I have experienced, a sense of invisibility as a woman in capoeira and, in everyday life. Later in her reflection, Mestra Janja continues with an intersectional view on the role of women in capoeira and in society,

I think women have simply been made invisible. Now we are visible [...] feminism promotes a radicalization of transformation of our world view that I only find similarity with capoeira, with the changes that it promotes in my life.

Mestra Janja's parallel between feminism and capoeira further chimes with our endeavour, particularly in light of male data bias in medical and scientific research, government policies, technology and even on a day-to-day spatial engagement with urban planning (Criado Perez 2019). Capoeira promotes visibility, it begets it and the

examples above, bring our attention – in different ways - to how race and gender has everything to do with society and change in wider politics.

Although capoeira emphasizes a collaborative movement ethos within an encultured context (Downey and Lende 2012) we further suggest that there is possibility for practitioners to further develop an ethical ‘signature’ whilst embodying the fundamental aesthetic. ‘*Becoming black*’, ‘*letting go of useless [male] stuff*’ and challenging being ‘*put in the position of a little girl*’ open up profound pathways for not only challenging the hegemony of any particular cultural practice but also for growing a new bodies: in movement, affectively and in the brain, bodies that exists in a complex network of human an more-than-human forces. Through dwelling on the anatomy of our *becomings* we can consider the diverse (non-binary) biologies of our body politics and the specificity of how we encompasses both biological, technological, socio-political and environmental markers within any given improvisational movement exchange. How experience gets ‘under the skin’, and is not just discursively embodied is a vital emerging focus for research that examines the impact of racism, sexism, ableism, xenophobia and homophobia and trauma (Author 1, 2019; Herzman and Boyce 2010; Gravlee, 2009). Human with more-than human relating is mediated by body politics and as such, we argue that that change is untenable without due attention therein.

### ***Plastic Anatomies***

Given the *kin*-aesthetic significance of body politics in relating, the examination of the neurophysiological processes exploring this interaction is apt. For the most part a neuroscientific exploration of body politics and embodied processing has looked at neuronal activation in response to ‘in- and out’ group members. To reduce human

interaction in this binary fashion is obviously socially and politically problematic, and non-contingent, since the edges between human and more-than-human relating are not clear. However, this artificial binarisation often serves useful experimental purposes; simplistic categorisation allows for clear comparisons, experimental manipulation and the control of confounding variables. Although findings in the area are varied, a consistent theme emerges: neural embodied representations vary based on an ascribed group membership. For example, the use of neurostimulation techniques allows for the measurement of the degree to which the observation of another human, or more-than-human, is processed in the observer's own motor system – in effect, an index of embodiment. This measurement is known as corticospinal facilitation. Using neurostimulation and corticospinal stimulation a number of researchers have shown a reduced ‘embodiment’ of the observed other when that other is identified as an ‘out-group’ member, compared to those identified as members of the ‘in-group’ (Avenanti et al., 2010; Molnar-Szacks et al., 2007). Using functional Magnetic Resonance Imaging (fMRI), to measure activation from motor regions of the brain is another method used to infer the embodied processing of an observed other. Using fMRI, increased neural activation linked to increased embodied processing has also been observed during the observation of ‘in-group’ compared to members of the ‘out-group’ (Liew et al., 2010).

It is appropriate that the examination of brain network activation to artificially constructed fixed social groupings sits uncomfortably within our discussion. Human and more-than-human embodied *intra*-actions are conceptualisations that have yet to penetrate reductionist frameworks of the mind where over simplistic categorisations serve useful purposes but provide little insight to socially and politically complicated processes that govern our lives. Indeed, this juxtaposition is indicative of the tensions

inherent in interdisciplinary research that engages in an examination of underlying assumptions in each perspective. However, examination of the dynamic nature of brain states provides some insight that more readily can be said to contribute to a discussion on body politics. Critically, reduced embodied representations of those from an artificially constructed ‘out-groups’ are *plastic* in nature and can be influenced simply by recognizing the artificiality of these constructs and reversing them in the laboratory (Molenberghs et al., 2012). This evidence points to a system in the brain, which represents the actions of human and more-than-human others by mapping them on to a system we use for our own actions, being responsive to group membership or, in other words, body politics. Moreover, this neural marker of embodied representation, based on body politics, is very much plastic. We take this evidence as supporting the notion that our social interactions with the (human and more-than-human) other is influenced by body politics, is fundamentally embodied and, that categories are extremely mutable.

Although power dynamics, patterns of movement, styles of teaching and relating are internalized by our anatomies (Downey and Leder 2012) there is a possibility of holding these tensions and re-shaping body politics in politically progressive ways. Informed by such a more-than-human perspective, the plasticity of capoeira offers an example of neurocognitive, perceptual and physiological development in a profound way, and the corporeal re-forming is subtle and time layered and within a supportive and cultural system (cf. Oyama, 2000). Selves are co-constituted in the *kin*-aesthetic *doing* of capoeira: fixed differences and representations of the self/other. in/out group binary can be destabilised. However, we must also emphasise that to move without critical engagement will not do the work of destabilising on its own – it is ethical and considered movement that can produce powerful remaking of our perceived

differences. At this time of global climate and humanitarian crisis, the more-than-human implications for this points towards an embodied resistance that has travelled through time as embodied knowledge transfer through movement, singing and musical *intra*-actions demonstrating how each capoeira *jogo* is a process of, as Mestra Janja says ‘*acting politically*’ and as such, in and of itself, a small act of activism (Madison 2010).

### **I Felt a Little Bit of What It Is To Be You**



Mestre Poncianonho and Contra Mestra Fernanda Photo: Alice Underwood

Two people ‘play’ an improvisational ‘game’ of capoeira, in a highly developed corporeal conversation honed by a martial technique of attack and counterattack. Integral to the form is a percussive orchestra invoking the ghosts of resistance through story-telling songs. The orchestra and surrounding capoeirista’s form a circle known as a ‘roda’<sup>9</sup>. Similar to Winnicott's (1971) seminal psychoanalytical concept of a ‘holding environment’, and a core structure in DMP practice, the roda in capoeira is a tangle of human and more-than-human movement, musical orchestra, imagined and historical narratives that produce an experiential space for the pair to play in the centre. As such, we conceptualise capoeira as a sophisticated and complex

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<sup>9</sup> In Portuguese, *roda* translates as circle or wheel.

example of multiple *intra*-acting processes within a culturally and technologically defined space. After playing, and later, witnessing a capoeira movement exchange between two male players, Mestre Poncianinho speaks of these *intra*-actions,

Sometimes when I was playing, I *saw* a little bit of you [...]

and I *saw* sometimes a little bit of you in my movement.

For a moment, I *felt* a little bit of what it is to be you because of the physicality.

During the Lab we observed how the structure of capoeira problematises traditional understandings of intersubjectivity. In cognitive neuroscience, intersubjectivity refers to a process whereby the solipsistic gap between two private minds can be bridged. It does not deny the reality of inescapable private subjectivity and peripersonal space (graspable around the body) but emphasises the social nature of our existence. Developmental and neuroscientific researchers emphasize that neurobiological development is relationally driven through the reciprocal and continuous interactions and exchanges typical of humans in their first days of life (Ammaniti and Gallese 2014). From a psychotherapeutic lens, intersubjectivity continues to unfold in a triangular space: being participant in a relationship and being observed by a third person as well as being an observer of a relationship between two people. The third person breaks the dyad open into ‘shared attention’ and ‘shared situations’ (Beebe et al 2005). However, we emphasise that our basis in existence is the tangling and porosity among human *and* non-human others, and the mechanism whereby we can glimpse into the world of the other - is through a *kin*-aesthetic exchange.

## *Tangling*

Tilting the lens of entanglement towards neuroscience, insights into the ‘self-other’ overlap are based on extensive research covering the role embodied or ‘motor’ simulation in the processing of an observed other (cf. Rizzolatti & Sinigaglia, 2016). We take the view that a motoric representation of the observed other plays a fundamental role. Crucially, information about the other is provided by mapping the movements of an observed person on to one’s own motor system – a clear mechanistic account of embodied processing of the other. Cognitive neuroscience has largely been reductive in its definition of intersubjectivity as a solely language mediated performance. Whereas Gallese has offered a critique of this ‘third person’ perspective arguing that intersubjectivity involves ‘the mapping of the other onto the self, reciprocated by the mapping of the self onto the other’ (Gallese 2014: xi). Therefore, ‘knowing’ is distributed throughout the body as exemplified in DMP mirroring and kinesthetic empathy (Berroll, 2006). Indeed, our current EEG findings further support this embodied incorporation of the other during movement observation. As indexed by a suppression in ‘mu’ wave activity - a motor system, was active during the simple observation of actions in a capoeira exchange. However, in the Capoeira Lab we extended these concepts to include a tangling-with anticipatory movement. We heard many reflections from nearly all participants that spoke to this distributed and embodied knowing, Basetsana and Simon offer examples,

Basetsana: [I]t made me realise how much, even in witnessing,  
how embodied that is because when we're watching [...]  
I was imagining myself playing them together at the same time.

Simon: *It felt*, in a sense, like I was playing.

*I could feel* my body flinching and predicting movements that she would be doing and coming up with my own movements to follow her movements, as if I was playing it.

This tangling or *feeling with* has been developed in feminist dance and psychotherapy scholarship (Author 1, 2019, 2020) where autobiographical, relational, socio-political and environmental layers infold with movement improvisation allowing for an incisive and amplified way to engage with and extend the capacity for relating. Such layered improvised movement exchange highlights how we become bodies in the matrix of relating and are in Barad's (2007) sense interactively co-constituted through the movement. Cultivating the capacity to dynamically shift between 'me' and 'not me' and, assists as, Cooper-Albright (2013) has it, the process of moving beyond knowledge of self - in order to experience self-in-other. However, we revision the imagined stability of individualism, the fixity of 'self' and 'other', suggesting instead, that we are processual beings, unbound and that more-than-human relating is an *Embodied Signature*: a distributed and dynamic process that is, as Manning (2013) has it 'co-composed' by moving bodies - clearly exemplified by the capoeira improvisational exchange.

What, then, are the ethical and socio-political implications, of dissolving the (humanist) master narrative of 'I' and taking the self-other overlap as a processual given? As a signpost, much embodied-relational psychotherapeutic work involves 'feeling with' as Stern (2010) would say, feeling into each others' stories and into our own and each other's bodies. In this respect - as highlighted by Simon's *'felt sense'*, we are curious about *feeling with* in movement relating and how it impacts on what



happens in our affective-cognitive experiences. Damasio (1996) indicates that when the feeling evokes a response - we experience a physiological marker on a visceral level. Some research has also shown that brain regions said to be responsible for mirror mechanistic activity are active when participants are actively engaged in distinguishing 'self from other' (Schulte-Rüther et al., 2011; Uddin et al., 2006). This suggests that tangling is fundamentally an embodied process that involves motor and mirror neuron structures in the brain. To feel '*a little bit of what it is to be you*' is a co-composed process with political implications for micro and macro relating.

### **Looking Forward Ahead, Where The Eyes Can't See**



Mestre Brasilia with EEG cap and Mestres Falvio and Ze Antonio playing

Photos: Alice Underwood

Throughout the Capoeira Lab we became aware of the transformational potential in movement exchanges through a more-than-human reconfiguring of space, time and matter (Barad, 2007) where space is not as a 'container' and time 'not a succession of individual moments' (2017:180). In the meaning making reflection after moving, Mestre Brasilia, a historical figure in the development of capoeira, alludes to a non linear spatio-temporal process inherent within capoeira,

We have song with a chorus that says '*looking forward ahead, where the eyes can't see*', I don't know anyone who has nothing to learning, So we are always learning.

Mestre Brasilia's words contextualise the materiality of our learning: there are blind spots. However, the materiality of this movement practice is collaborative: we learn through *kin*-aesthetic relating. Mestre Brasilia indicates '*looking forward ahead, where the eyes can't see*', a process, perhaps of recontextualising one's future in a historical context: looking forward in to the past. Or is Mestre Brasilia hinting at 'remembering the future' (Manning 2012: 137)? We are also reminded of the Aymara language who use metaphors to indicate the past as being in front and the future behind (Núñez and Sweetser, 2006). Such nonlinear, nondeterministic and dynamic conceptualisation leads us to be curious about *spacetime mattering*, as Barad (2007) has it, during *kin*-aesthetic exchanges, how the body comes to know – through the environment, affectively and in the brain.

In capoeira movement, one of the ways the quality of *spacetime* can be felt is less in an individual body than in the intra-actions: the spaces in the making, the entanglements of bodies, orchestra, witnesses, historicity and geographical location. These *intra*-actions potentially allow learning and change to be fluid, where responsibility and individualism is in Barad's sense not one's own, instead, '[P]ast, present and future bleed into the "now" of questioning...presence is a matter [...] of inheriting the future as well as the past' (2012). Further back in time, the African mythological Orixá, Eshu, is known to sit at a crossroads simultaneously seeing into past, present and future (Lorand Matory, 2016). Such time travel may assist the

process of cultivating the capacity to see what we cannot see: our unconscious biases in relating.

The conceptualisation of *spacetime* within cognitive neuroscience is qualitatively different from conceptualisations within the social sciences. Some cognitive research has aimed to explore how our representation of space is modulated by the presence of others; this research has some useful contributions to our current considerations. In three experiments, Teneggi, Canzoneri, di Pellegrino and Serino (2013), show that peripersonal space (the space around the body) boundaries changes in the presence of another person. In the case of cooperation peripersonal space seems to extend to incorporate the other but in the absence of cooperation it shrinks. These experimental findings demonstrate sensorimotor processing of space is influenced by social processes. In effect, the processing of space is fundamentally changed during movement relating.

Together, these findings suggest that space is also an embodied process; that our representation of spatial information is a sensorimotor process that is responsive to social information. More than this, in the case of a dynamic and complex social interaction, such as that that takes place in the capoeira roda, we imagine a more-than-human reconfiguring how, as Manning observes, ‘the room moves the participants to alter the composition of the event’s unfolding in experiential time’ (2013: 98). In this context, *spacetime* dynamically stretches and shrinks as the dances unfold between collaboration, competition, memory and affective resonance.

### *Transgenerational Freedom*

Even though capoeira exchanges are inherently relational, as we have already made clear, it is important to emphasise the non-neutrality of moving bodies and how sensorial engagement is mediated by a wider socio-political environment and physical location (Downey 2007; Ingold, 2000). Thus, the potential for affective, sensorial and spatiotemporal reconfiguring in capoeira - possible through *kin*-aesthetic engagement - demonstrates the plasticity of perceptual systems. In fact, Calvo-Merino et al. (2005) have shown that expert practitioners of a movement technique (ballet and capoeira, specifically) have greater activation of the mirror neuron system during passive observation of their own dance technique. Such autobiographical tangling demonstrates our plastic anatomies: experience and expertise modulates activity. It also shows that visual information conveying movement is processed and understood via embodied processes. In later research Calvo-Merino et al. (2006) conclusively show that visual information about movement is understood using motor systems and that it is our motoric experience that influences this.

We are struck by this *kin*-aesthetic intelligence (or ‘seeing’) and extend this thinking to include the ontogeny of the individual and how this is simultaneously reflected in the ontogeny of the capoeira exchange. Placing ontogenetic and phylogenetic processes within a political framework Grosz offers us an embodied perspective for understanding ‘freedom’,

‘Freedom is not primarily a capacity of mind but of body: it is linked to the body’s capacity for movement, and thus its multiple possibilities of action. Freedom is not an accomplishment granted by the grace or

goodwill of the other but it is attained only through the struggle with matter, the struggle of bodies to become more than they are, a struggle that occurs not only on the level of the individual but also of the species' (Grosz, 2010).

The 'struggle with matter' perhaps suggests the possibility that we all have to grow new bodies, during *spacetime* intra-actions, in order to engage with the nuances of freedom in relating with more-than-human politics. Capoeira, like DMP, is an embodied-experiential practice that can instil and educate practitioners, across the lifespan, to learn more-than-human values of respect, boundaries, self-confidence, collaboration, care and within the expression of body politics – through improvisational movement. In many ways, some teachers of capoeira implicitly contribute to the redefinition of wider socio-cultural and environmental power structures. This experiential learning offers an antidote not only to a Brazilian backdrop with high rates of sexual and domestic violence and children forced into prostitution (WHO 2015) but also globally in our climate crisis and humanitarian crisis of xenophobia, racism, sexism and homophobia. During the Lab, *Mestre* Flavinio spoke to these existential shackles,

Capoeira is something, in the old days, it was really a freedom fight, it assisted their fight for freedom, it helped... and nowadays I think it helps children, everybody, to free their blocks, their slavery, fear or aggression.

The *kin*-aesthetic intelligence of capoeira undoubtedly contributes to the reconfiguring of wider socio-cultural power structures. This nonlinear *intra*-action

between *spacetime* and bodies speaks directly to the potential activism and can be exemplified in the international work of *Mestre Roxinho* with African refugees and young people who have experienced traumatic events such as war, human rights violations and displacement. The ‘Project Bantu’, offers psychologically informed capoeira that promote shared leadership, collaboration, building trust and belonging to a group, and assist with the process of mitigating anti-social behaviour, building resilience and cultivating empathy (Momartin et al 2018). Dovetailing this work, we consider that our DMP and neuroscientifically informed capoeira lens contributes further: by emphasising how movement relating is contingent upon the *intra*-active and spatiotemporal differences of our anatomies, body politics and more-than-human environments. We use this material-discursive awareness to highlight the embodied nature with which we come to perceive, interpret and understand our relationships with human and more-than-human others and how this creates a space for potentially transforming traumatic experiences of precarity and vulnerability into states of possibility.

### *A Capoeira Me Chama*<sup>10</sup>



Musical and movement playing in the Capoeira Lab.

Photos: Alice Underwood

During the meaning making discussion in the Capoeira Lab Mestre Brasilia reflected on the uniqueness of capoeira, ‘*It’s the only martial art that has this relationship of*

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<sup>10</sup> Translated from the Portuguese: Capoeira calls me.

*playfulness*'. The very act of playing in Capoeira is similar to Manning's (2013:110) 'participatory ecologies' in that it generates complex patterns of ecology that touches on the everyday while moving spatiotemporally - beyond the individual and beyond the event.

Capoeira is a process (at best) of seamless material-discursive rapport that potentially introduces spatiotemporal kinships with human and more-than-human others. For practitioners, this kinship (beyond family blood ties) includes, as Mestre Brasilia indicates, *playfulness*, as a driving force. Movement improvisational play is core to DMP practice and draws from Winnicott's (1971) early developmental conceptualization of childhood play as a transitional psychological phenomena - a practice for life. Playfulness in capoeira chimes with this psychological transition and is manifest through a variety of complex *spacetime intra*-actions of musical rhythm, song and each other's moving bodies. These *intra*-actions emphasise a cross modal process of communication on micro and macro levels. In this context, we refer to cross-modal communication across two, or often more, perceptual and/or communicative processes such as hearing, gaze, reach space, space, smell, perception, laughter.

Neurodevelopmental and psychotherapeutic studies (Ammaniti and Gallese 2014; Beebe et al, 2005) emphasize how our affective selves are not developed in isolation, but together; the parent-child relationship is a dynamic kaleidoscope of affect-regulation that involves shared power-play, intimacy, facial expression, gaze, touch, collaboration. Similarly, capoeira is played within an ecology - not in silo where cross-modal communication across strata manifests as a concrete embodied process of 'feeling with'. Feeling-with on a neural level is observable in parent-infant

interactions from an early age and possibly underpins how we relate in the social domain. Hasegawa et al. (2016) demonstrate a correlation between the brains of parents and infants in the degree of mu rhythm modulations - a neural signature of embodied simulation - and that the mothers' mu modulation is associated with the degree to which they follow their child's head movements.

Affect-regulation as a crucial component of feeling-with, has clear neural correlates. For people who have experienced trauma this regulatory process is fundamental: it is a key feature of forming a safe and potentially reparative relating. During trauma, the capacity to regulate and maintain an embodied sense of the present breaks down, thus leaving the person immersed in a never ending 'present' of past traumatic experience. Although there is a great deal to negotiate in a game of capoeira - as there is in the living of everyday life - it offers a potential antidote to developing an embodied regulatory 'filter'. The kaleidoscope of experience possible in one encounter with another person is layered with the uniqueness and difference of each individual. Our expert DMP witness, Gerry Harrison, commented on her experience of affective regulation when observing two capoeirista's engaging in a moment of physical contact through the hands,

There's an interval where you're moving and you make connections with the hands and you go forward and back.

That felt really regulatory, it felt as if it was helping balance.





Example of a *chamada*. Photo: Alice Hiscoke

What Gerry observed in the two players was a *chamada*<sup>11</sup> in capoeira – a ‘call’, instigated by one of the players wanting to change the rhythm of the game; to interrupt the flow and take it in another direction. This is one of the exceptions in capoeira where players make physical contact. Often mirrored by the ‘call’ of the *birembau* and songs. This interruption cleaves conventional notions of space and time, and allows for the players to change the rhythm of their encounter and notice what can be enfolded as the movement composes the movers (Manning, 2013).

The ethics and political implications of this ‘call to action’ lead us to reflect on the organismic capacity to regulate, to move *forward and back* in order to *balance* the (re)configuring of body politics and selves during the demands of relating across different *spacetimes*. Such movement is a trademark of early infant engagement with the primary caregiver and within an adult developmental context we are curious about this movement as a way of developing a psychosomatic filter, a ‘second skin’ perhaps, that assists with co-regulation and therefore, care, during challenging and even traumatic mental health experiences. One of the features of this second skin is arguably, managing the tension between strength and a sense of body ownership and vulnerability. In capoeira, this is constantly and dynamically negotiated through an

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<sup>11</sup> In Portuguese *Chama* is ‘to call’

‘open’ and ‘closed’ body (Assunção, 2005), not a binary - rather, it is a permeable and *intra*-active process of psychophysical relating, of moving forward and away from each other as movers; protecting and responding according to the needs of the exchange in any given moment. This process is psychophysical because it is learned through rigorous movement practice, with/in a cultural milieu, and integrated in the brain, affectively and socially. Such practice allows movers to engage intuitively and ‘dance at the limits of the as yet unthought’ (Manning, 2013:33), limits, that can perhaps found at the intersections of our body politics. The call to action thus lies in re-imagining the current diagnostic hegemony in mental health and cultivating instead, an embodied experiential ‘diagnosis’.

### **Belonging with Activism**

Going forward, necessary research could consider the implications of such psychophysical enculturation in order to explicitly work with the ethics and politics of our diverse and complex embodied signatures - as pathways towards activism. During meaning making reflections after moving in the Capoeira Lab, Xenia, a black South African woman, remarked on the diversity of the capoeira group to which she belongs. Her words summon the reconfiguring of kinship across *spacetime* with human and more-than-human others,

We're so many people from so many *different* places,  
and so many *different* experiences and somehow we all  
belong together.  
We've created this community and this sense of  
belonging to *this thing*.

We are drawn to Xenia's reference of '*this thing*' capturing perhaps the nature of a process in flux, a non deterministic capoeira practice and community, a space/place of transgressive borders and boundaries, not without its tensions and yet, with a capacity to hold, as Xenia repeatedly says, '*difference*'. This 'thing' is perhaps indicative of how no specific language exists in the cultural hegemony to conceptualise this future belonging-with. Belonging-with involves more-than-human relating.

There are parallels between the embodied relating in/between capoeira, DMP and neuroscience and, our aim is for this work to contribute to developing and expanding ways of relating ethically, with/in difference. The question we, as therapists, scientists, artists and activists need to ask ourselves, is not whether the body is relevant but *how* the moving body and interdisciplinary methodologies help us to mediate and enact vital issues of more-than-human rights. The moving, expressive body is at the centre of relating and we suggest that without proper consideration of the ethics, politics and *intra*-activity of human and more-than-human processes, artistic, scientific and psychotherapeutic paradigms are constitutionally and ethically lacking. To stand alongside posthuman and more-than-human seminal theorising (Manning 2013; Harraway 2008; Barad, 2007) we consider that justice-to-come requires engaging with the complexities of co-composed movement and the incipient differences therein, allowing twenty first century questions and signatures to ethically flourish.

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