

Critical Appraisal

Shifting Interfaces: art research at the intersections of live performance and technology

This collection of published works is an outcome of my practice-led inter-disciplinary collaborative artistic research into deepening understanding of creative process in the field of contemporary dance. My research has not followed the trajectory of traditional doctoral studies, and framing it as having a set of clear a priori specified aims and objectives would be artificial. One of the benefits of submitting this collection is the opportunity to conduct a post-hoc analysis that draws the reader's attention to the overall coherence and singularity of the seven year study represented here, and offers me the chance to reflect upon those patterns myself. These can only appear within a context of theoretical assumptions or held beliefs, normally articulated at the start and then tested in the context of the research. In my case, I can retrospectively list four theoretical assumptions related to both the form of my distinct contribution and the modes of its formation which I believe my research has effectively tested and shown to be robust enough to stand for further development.

First, that though there is something irreducibly complex about the creative process in contemporary dance, it can nevertheless be made available to reflexive study. Second, creative process in dance, as a topic of 'mutual interest', can make itself manifoldly available to different disciplinary perspectives which can participate collaboratively in this study. Third, what qualifies as knowledge that might emerge from this inter-disciplinary study is largely constituted and governed by social relations: its value is in these relationships as much if not more than in something separate from them. Fourth, that a practice-led artistic research into the creative

process in contemporary dance does not have to result in either the production of texts or art works to be engaged in materializing research outcomes.

In this Critical Appraisal, I will frame and demonstrate the progressive development and overall coherence of my research to be found in the published works submitted in this thesis. I have organised them chronologically according to date of the writing rather than of publication. I have inserted a title and context page before each, with information about the circumstances (invitation or proposal) informing the writing. The rationale for inclusion of this corpus of thirty published works, written between 1999 and 2007 inclusive, will be supported by weaving references into the Critical Appraisal to specific pages in the collection. These will be bracketed, e.g. [p 321], to distinguish them from other references and help the reader recognise and trace the form and content of the research. This system of referencing will also point to the contemporary relevance of the different publishing formats and platforms.

In the following sections I firstly outline the way in which my research has intersected with diverse fields of practice. I then provide my assessment of the most important consistent lines of enquiry and where evidence of these can be found in the published works. This is followed by details about the contexts and forms of my contribution outside of the published work. I close with a discussion of the contribution to knowledge I believe I have made and thoughts about where the research is going next.

FIELDS/ EXPERTISE

In my writing, the concepts of domain and discipline both stand in occasionally for that of a field. Integrated with use of these concepts is the notion of expertise: something existing inside the frame of any field, domain or discipline that is recognised as such. Expertise corresponds to levels of competency particularly

when related to using computer-based hardware/ software. Expertise also has connections to legibility – when language is used in a specialised or expert discursive register it can be highly enabling within the context of that particular field, while disabling attempts to communicate between disciplines.¹ Expertise corresponds to practice-based mastery, a result of extensive training and study – “advanced material knowledge” (Carter p 179), “signature practices and singularity” and the “expert-intuitive” (Melrose 2009 p 29) – as well as ways of seeing and writing. Expertise also has an important social dimension in the frameworks that are set up in any domain or field for valuing (as in recognising, evaluating and promoting) a particular arena of specialist practice. In other words, expertise is seen to be constitutive of the field itself.²

By the mid-1990s, I was an established practitioner in the contemporary dance field, having worked professionally for over a decade as a performer and choreographer, first in North America and later in Europe, where I taught classes in dance theory and composition and mentored student choreographers at the School for New Dance Development, Amsterdam School of the Arts.³ My first encounter as a dance specialist with digital technology, in the context of an international symposium I organised in 1996, was a precursor to my research.⁴ This encounter did not configure a distinct field or discipline out of technology, though it began to structure a number of conceptual, practical and personal relationships that I would later build into my inter-disciplinary research. This took place partly through the community-building work I did following the symposium, when I collaborated with media-

¹ Legibility is usually associated with ‘readability’, but I am referring to an expanding notion of a literacy which includes understandings of non-language forms of expression. This opens up the challenge to be one of comprehension.

² The overlaps between disciplinary knowledge, expertise, techne, craft and how these overlaps apply to thinking about practice-led research are thoroughly explored in the writings of Paul Carter and Susan Melrose, both making reference to the “pertinence of a pre-Aristotelian entwining of ‘techne’ and ‘episteme’” (Melrose & Hunt 2005 p 71).

³ SNDD is a school for the “independent dance artist/choreographer”. <http://www.english.theaterschool.nl/> (accessed 7 May 2010).

⁴ ‘Connecting Bodies: an international symposium on the connections between the discourses and practices of dance and technology focussing specifically on the impact of new media technologies on dance making/ choreography’, Amsterdam, June 1996. <http://www.sdela.dds.nl/boi/sympos.htm> (accessed 7 May 2010)

performance artist Mark Coniglio on re-launching an email list and setting up a website as a resource for artists who use new media technologies in performance, and partly through speaking and consulting engagements on the topic of new media in arts education.⁵

There was a tendency amongst the community Coniglio and I were addressing with the website and discussion list toward melding an emerging field out of Dance and Technology, something I comment on critically in 'Dance (in the presence and absence of) Technology' [pp 323-329].⁶ In 2001, I contrasted the notion of something field-like appearing by describing the relation between dance and computers as 'episodic' in 'Periodic Convergences: Dance and Computers' [p 125]. In retrospect, there was no distinct other field in place at the start of my research. Early encounters with computer scientists and engineers mainly forecasted interdisciplinary collaborative research to come. My first two published works establish two critical lines of enquiry, which I will discuss next, from inside the field borders of contemporary dance.

By 2000, I was developing a wider network of relationships within the growing movement of digital and New Media Art which stood for a recognisable collection of artists and art works, increasing "institutional embrace" (Tribe p 21), including collection and preservation efforts, and an abundance of theoretical discourse, some of which was important for me such as Lev Manovich's 'principles of new media' because of its focus on materiality (Manovich 1999).⁷ This wider network provided me opportunities in the context of 'interdisciplinary research labs' to position myself as a researcher outside of the discipline of contemporary dance [pp 79-90, pp 147-

⁵ Major consulting commissions from Laban London and Amsterdam School of the Arts. See <http://www.sdela.dds.nl/labani/> and <http://www.sdela.dds.nl/ahkreport/> (accessed 7 May 2010).

⁶ The dance-tech discussion list reached its peak number of messages exchanged in 1998. The website (<http://www.art.net/~dtz>) received no further updates from Coniglio or myself after mid-1998.

⁷ The principles Manovich describes in his 1999 text—discrete representation on different scales, numerical representation, automation, variability – offered insight into how to understand making in the context of digital and media art.

155], or as an organiser and facilitator of creative exchanges between dance and new media artists [pp 187-194]. Both situations were fruitful for my research, but 'Software for Dancers' (2001) provided a primary critical impetus for my practice-led collaborative research into the creative process in dance [p 120 note 1].⁸

At the same time my research frame was beginning to extend beyond the arts to the domain of science. This was supported by a commission to undertake a survey of extant UK based collaborations involving performing artists and scientists for the Collaborative Arts Unit, Arts Council England. This brought me into contact for the first time with the working methods and environments of non-art expert practitioners, for example cognitive-neuroscientists and social scientists.⁹

There is no exact moment when one phase ended and another began, but seen in retrospect, from 1999 through 2002 I was building an important network of relationships, developing conceptual frameworks and gaining vital experience for what was to follow. By the end of 2003 or early 2004, I was leaving behind the wider community-building and consulting work to pursue a more independent and focused enquiry. As part of this change, the contact I established with scientists through the work for the Collaborative Arts Unit developed into 'Choreography and Cognition' (2003-2004), the second major critical impetus for my research [pp 203-207].¹⁰

'Choreography and Cognition' took me into close contact with non-art disciplines, but similar rules regarding expertise apply. The structuring of the space for inter-disciplinary communication is the same with heightened attention to legibility. Susan Melrose and Nick Rose refer to "mixed-mode practice which must be articulable in

⁸ See documentation website: <http://www.sdela.dds.nl/sfd> (accessed 7 May 2010).

⁹ See Ground Work report on line <http://www.sdela.dds.nl/gw/> (accessed 7 May 2010). I was influenced by Michael Century's 'Pathways to Innovation in Digital Culture', commissioned by the Rockefeller Foundation and published in 1999. In this report, Century analyzes the studio-laboratory as the context for a "transdisciplinary knowledge production" involving the arts as a major constitutive force for innovation outside of the boundaries of its own field. <http://www.nextcentury.ca/PI/PI.html> (accessed 7 May 2010).

¹⁰ See documentation website: <http://www.choreocog.net> (accessed 7 May 2010).

an agreed disciplinary-specific set of multi-faceted codes” (Melrose & Rose 2005 p 75). The challenge is not to let this agreement override mastery but to maintain disciplinary-specificity as much as possible. This is one of the reasons some of the submitted works from this project are co-authored. They share the responsibility of making expert thinking legible across fields.

There might be concern that fields and expertise appear to be fixed-stable entities. This is no more the case than if one were to assume a craft skill is in some way fixed because of its association with tradition. Paul Carter writes, “Craft is associated with a gift for ambiguity. It is a skill in loosening positions that have been fixed.” (p 179) The same follows with expertise. With expertise in place fields are shifting centres of gravity under constant adaptation as ideas of all descriptions get pulled into their orbits. Expertise in the context of a field or discipline also stands for the type of “personal commitment” often underemphasised in discussions of practice (Polanyi p 61). My collaborators bring themselves as individuals with expertise to the research process. They know and are prepared to explore the limits and stretching places of their field or discipline within which they have an established professional practice.¹¹

In summary, the questions I am formulating regarding creative process are coming from inside the dance field, and I am engaging practitioners from outside the dance field to approach these questions from their own diverse expert perspectives. That is why I describe my work as inter-disciplinary collaborative artistic research; it effects connections or relationships through individuals to other fields and disciplines, but relies on the individual to channel the connection with the particular domain. They are colleagues and my guides to diverse modes of thinking.

¹¹ See in this collection my ‘Willing Conversations: the process of being between’ for a discussion of inter-profession dynamics [p 293].

LINES OF ENQUIRY

Two fundamental concepts are established in the first two published works in the collection. Firstly, I draw attention to the ‘algorithm’ as a process-level connection or bridge between dance composition and computation [pp 40-43]. Then I explore how biomechanics, as the empirical study of movement, might be embedded as a ‘knowledge base’ in the practices of both computer animation and dance and thus form a special correspondence between them [pp 56-60, pp 67-69].¹² In the following paragraphs, I provide a partial roadmap for indexing into the evolution of these two ideas as lines of enquiry throughout the published works to follow.

These two concepts convert into the following research questions:

- 1) When does it make sense to bring computation (coding the digital) as creative process and dance-making (composing the analog) into the same frame?
- 2) Do adequate descriptions of movement exist that can bridge the space between dance and mathematics, binding together in some shared space of understanding dancing (corporeal), algorithmic and biomechanical bodies?

In exploring question one I began to study software programming as both a work activity and the material products it gives rise to. My objects of study for this were selected software tools and their use in art making contexts in the field of new media art practice in the context of the ‘interdisciplinary research labs’ mentioned earlier. Projects like ‘Hot Wired Live Art’ (2000, 2001) provided critical opportunities to observe and interact with artists with varying levels of expertise (both competency and mastery) with software and get a feeling for what digital technologies bring to

¹² My interest in computer animation constituted a sub-theme for a period, stimulated by the procedural human figure animation research of Michael Girard and Susan Amkraut, which I write about in the context of the collaboration with Paul Kaiser, Shelley Eshkar and Merce Cunningham [pp 67-69, pp 163-164].

the creative process [pp 79-90, pp 147-155]. In keeping with both my research interest and my role as discussion facilitator I drew on emerging media theory for conceptual frames [pp 82-83], probed collaborative creative process and posed specific questions about programming. I also conducted interviews with software tool makers and users, for example, with Mark Coniglio about his 'Isadora' software [pp 169-184].¹³

The 'Software for Dancers' project (2001) marked a shift for me away from studying software tools used in the labs to researching the design of new software tools to augment the creative practice of expert choreographers and dancers. I discuss this shift briefly in a published interview [pp 110-111]. 'Software for Dancers' prompted a refocusing of my question about bringing computation and dance making into the same frame and was the inspiration for me to write about software as a language, tool and material [pp 115-121]. It also brought me in direct contact with four established choreographers who made it clear that what they gained most from the experience was the focused opportunity to question their own making practice in the context of other expert makers. At the same time, inspired by exposure to debates about Open Source software with its emphasis on collective creativity, I published an important piece that stepped away from software as a material to rigorously explore cultural similarities and differences between choreographic methods and computer code [pp 137-143].¹⁴

As I found myself refocusing on the concerns of choreographers and reflecting on their creative process in the context of exploring ideas related to digital media, my research frame was opening to the domain of science. The invitation to write for *Performing Arts Journal (PAJ)* in October 2000 coincided with the Arts Council

¹³ I conducted several interviews and dialogues that are unpublished, for example the 'Barriedale Operahouse Dialogue' and the 'Monaco Software Discussion' can be found here: <http://www.sdela.dds.nl/sfd/> (accessed 7 May 2010).

¹⁴ Some of the historical touchstones in my writing involved 'computers and dance' projects in the 1960s and 70s [pp 125-128, pp 159-161, p 115]; and includes a quotation from Merce Cunningham circa 1968 about the future possibilities of computers and notation [p 74].

England commission to investigate collaborations involving performing artists and scientists. This provided an opportunity to reflect on the work of Blast Theory whose collaboration with computer scientists and engineers was an inspiration for my understanding of rich inter-disciplinary collaborative practice [pp 96-99], and the group appears frequently in this published collection.¹⁵ The PAJ article also explored the limits and possibilities of choreography in virtual 3-D spaces [pp 93-101], something I return to seven years later in 'Choreographing Cycling Anims' [pp 351-360].¹⁶

Another inspiration has been the work of kinesiologist Hubert Godard who inspired me to recognise the "labor of dance" in my writing [p 100]. My perspective on the constitution of mastery in the contemporary dance field continues to be informed by this expert prowess acquired through dance training.¹⁷ In one of Godard's few published interviews in which he discusses dance, he characterizes the dancing body as an "accumulation of corporeities" (p 15) eloquently challenging me to rethink the attraction to biomechanical descriptions of movement.¹⁸ In trying to 'flesh out' my own writing about dancing bodies, I refer to the dancers working for William Forsythe and explore imagined scenarios bringing the concept of dance training and interactive installations together [pp 105-106]. The idea that dance training and practice (repetition) offered an interesting challenge and contrast to the concept of the "bodies as interface" and the "tendency to simplify" what constitutes experience in the discourse about interactive systems appears in other locations in the written material [pp 129-131, p 162].

¹⁵ Artists and artist groups often feature in my writing as exemplars, particularly when I was invited to provide some overview of the possibilities lying at the intersection of dance and digital technology. Published works No 1, No 14 and No 19 do this most explicitly.

¹⁶ 'Choreographing cycling anims' was anticipated in 'Sightseeing on digital pathways' in the paragraph about *Topologies L'Instant* [p 198].

¹⁷ Susan Melrose frequently discusses the "highly trained dancer" in the context of her discourses on performance practice (2009 p 25). See publications list and on-line material here: <http://www.sfmelrose.org.uk/> (accessed 7 May 2010).

¹⁸ Hubert Godard participated in a project I co-organised to research the potential an interactive system might have for dance training, titled 'Extending Perception', during the Monaco Dance Festival December 2004. See: Menicacci, A, Quinz, E, 2006, 'Étendre la perception? Biofeedback et transfert intermodaux en danse' in *Scientifiquement Danse: Nouvelles de Danse*, 53, pp. 76-95.

The concept of descriptions that bridge dance and mathematics as “the relation between real bodies and data bodies” reappears in the research report ‘The Dimensions of Data Space’ [pp 187-194]. In the report, I draw a frame around “representations, classifications, algorithms, notations and code” as potentially “co-meaningful” [p 192], a concept elaborated on in the future [p 300, p 278, pp 307-320]. Some of the origins of movement science is explored in ‘The Human Walking Apparatus’ [pp 235-244], but that essay closed that particular sub-theme. My commitment to the study of choreographic creation in an interdisciplinary collaborative research context, combined with opportunities to pursue this with expert practitioners, in particular dance makers themselves keen to participate in the research, was at this point guiding my research progress.

The ‘Choreography and Cognition’ (2003-2004) project marked a second major research shift for me and drew together the two lines of enquiry begun in 1999. Its first iteration, funded by the pilot Arts and Science Research Fellowships, was set up in close collaboration with choreographer Wayne McGregor, also a collaborator on ‘Software for Dancers’, and reflected his questions about choreographic process.¹⁹ The project featured scientific research into the temporal dynamics of movement, investigation into the notational uses of choreographic notebooks as design tools and the beginnings of collaborative research into ‘choreographic thinking’ – the embodied mind of dance making [pp 203-207].

This new collaboratively explored theme recurs in my writing. In ‘Transactables’, I describe the potential of a dynamic relationship the choreographer and dancer have with their notebook, articulating a continuum that involves interaction with the page in a rational process of using structures such as triggers and stimuli to help do

¹⁹ The Arts and Science Research Fellowships were jointly funded by the Arts Council England and the Arts and Humanities Research Board. I was engaged as a research consultant by the Collaborative Arts Unit in spring 2002 to develop the assessment criteria for the scheme which had only two cycles.

creative work in the studio [pp 211-212].²⁰ From this perspective notebooks provide a possible way of accounting for and learning from the ephemeral via the inspection of marks linked to movement decisions or choices.²¹ In a short essay titled 'Moving Ideas: questions for the dancing mind' written two years later, I build on this link between dance drawing and making as continuous internal and external processes in the context of historical linkages to the notion of the "thinking body" [pp 287-289].

'Choreography and Cognition' was a complex project with multiple layers. At its core was the organisation of a two day schedule that established the working conditions for the project [pp 220-228]. The first publication to materialise as a concrete result of the project was a work of co-authorship at the end of a long period of analysis and interpretation of one of the experiments [pp 261-274]. This work, 'What's in a Phrase?', makes a bridge between two field/ expertise areas, nesting and making legible expert observation based on specialist knowledge from the domain of cognitive psychology within a contextual framework based on knowledge of contemporary dance practice. It draws attention to how tools or instruments can be used to provide support for non-verbal study and the possibilities and limits of art and science collaborative research [pp 272-273]. It also lays the groundwork for an applied theory of choreographic thinking, and moves in the direction of what might constitute a choreographic resource in the collection of data. In a follow up article, notational properties of visual representations and ideas about augmenting the choreographic process are developed alongside further analysis of the experiment [pp 277-283].²²

²⁰ This process could be seen as a computational one, using the notebook to look for and discover solutions. This is discussed in David Kirsh's section on 'thinking with things' in *The Cambridge Handbook of Situated Cognition* (Kirsh 2009). Kirsh is a key collaborator with whom we researching distributed choreographic cognition. See: http://www.randomdance.org/r_research/current_projects1 (accessed 7 May 2010).

²¹ Such inspection might lead to augmenting or intensifying creative practice through a refinement of the basic tools known to be used. One such refinement, *RotoSketch*, a software programme supporting video annotation is an outcome of the 'Software for Dancers' project developed in collaboration with Zachary Lieberman. A alpha version can be downloaded here: <http://thesystemis.com/rotosketch/> (accessed 7 May 2010).

²² These two publications signal the start of one of my important long-standing collaborations with cognitive psychologist Phil Barnard.

Picking up the theme of collaborative modes of working, something I address more fully in the next section, I take 'Choreography and Cognition' as a case study for exploring some important social mechanisms supporting interdisciplinary (art-science) research [pp 293-295]. Shortly thereafter, in 'Sharing Questions of Movement', I add layers to earlier observations about the potential for interdisciplinary collaborative research while giving some examples of how dance might maintain the integrity of its own questions [pp 299-303]. This work also picks up and extends the concept of co-descriptions developed earlier, an idea which is thoroughly tested in the next published work in the sequence 'Sharing Descriptions of Movement'. This publication explores in great depth and detail the relationship between computation and dance-making by focusing on and reporting the evolved research of selected artists [pp 307-320]. It gives examples of how thinking about danced movement from an analytic perspective has evolved and integrates my independent research developments with that of other colleagues in the field.

Although not the final publication in the sequence, 'Constructing Memory: creation of the choreographic resource' could be read as a summation of the research presented here as well as an indication for the future. Here, the collaborative research projects of four established choreographers are described in the same context which affords productive comparison. These projects, which I am either leading or advising on, are making the creative work of these dance makers available for self- and shared study [pp 333-342]. The concept of choreographic resources, making its first appearance in this publication, points toward a wider dissemination of my research work, and the work of the involved research teams. The final publication in the sequence is my introduction to the book *Capturing Intention* (2007) [pp 363-368]. Like this Critical Appraisal it links the reader into other written material, but it does so in a framework which also encapsulates and

reiterates in a condensed way just how far my first two ideas have travelled in seven years.

OTHER CONTEXTS AND FORMS

It should be clear from the previous sections how transformations in both my field relationships and lines of enquiry are connected and co-inform each other. It is also important to recognise that the published collection here has been shaped in response to two basic circumstances: (1) invitations from someone else to write on a theme and/ or report on the content of a research project; or (2) proposals from me (sometimes with co-author) to write on a theme and/ or report on the content of a research project. Some specific details of these are provided in the title/ context pages before each published work.

In this third section, I will address some of the specifics of conditions lying outside of the published work in the context of research projects which include the 'interdisciplinary research labs' as well as the two major projects 'Software for Dancers' and 'Choreography and Cognition'. These projects were all fundamentally concerned with supporting reflection on creative process in art making – in the context of making. They have been the primary sites of my engagement with my own practice-led inter-disciplinary collaborative artistic research. I will briefly describe my roles in the various research projects.

My practice-led research is underpinned by two capacities. One is as a writer, which is partially in evidence here in this submission of collected works. The other is my ability to organise and subsequently facilitate a stable arrangement of social conditions for interpersonal relations to enact themselves in ways that can be individually valued within a certain agreed framework. That value is not extractable as such because it happens in the experience of moment to moment relations that

unfold in the context of the project where learning, teaching, transmission of understanding, development of ideas, trajectories of thought, action and making of movements and objects all come together. In one published work, 'Willing Conversations' [pp 293-295], I reflect on these aspects of my practice (writing and facilitation) in relation to the 'Choreography and Cognition' project.

In 1998, I began accepting invitations to participate in short intensive sessions, interdisciplinary research labs, aimed at supporting a small group of artists coming from different practices to explore collaborative creative work together. I was invited, not as an artist, but as a researcher and facilitator. My role was, in addition to documentation of the project, to support individuals and groups in their own creative work. For this, I provided reference points and other resources such as structures for discussing their making process. I have already mentioned using these projects as opportunities to study software tools in use, but I also advanced my understanding of creative process and its reflexive study through helping other artist practitioners articulate their process-based research questions, aims and objectives. After a couple of years, I became more instrumental in setting up and directing such projects, continuing to use some of the same methods for extracting (accessing, probing for) important information from them, even as the field/ expertise frame expanded to include non-art domains. At the same time, as I had built up a community around me, I effectively had established relations with a group of researchers who could be drafted in for particular projects.²³

It has been a challenge to continuously conduct my own research while actively contributing to the conditions of research for others. One way I have done that is to maintain a certain perspective on collaboration. When I say my research has been collaborative, I don't mean that the outcomes of the projects I have organised have

²³ For example, Inside Movement Knowledge which I currently co-direct has 24 individual researchers comprising five research groups and an International Associates Network. One-third of these were involved in previous research projects. <http://insidemovementknowledge.net/> (accessed 7 May 2010).

been collaborative. In these projects outcomes themselves are not necessarily shared, but they are multiple and can be represented as emerging from a set of shared conditions (which include peer to peer feedback, ideas exchange and support), where participants get to keep their “starting point” [pp 149-150] as well as generate individual outcomes. They may also generate collaborative outcomes, but what is always shared is the social space of relations.²⁴ As I have steadily moved into the position to set up and direct my own projects, I have been able to develop these to correspond more closely to my research questions and lines of enquiry, but the principle of multiple individual outcomes in different domains remains the same.

CONTRIBUTION TO KNOWLEDGE/ AND THE FUTURE

I will return to my four assumptions laid out at the start of this Critical Appraisal. My first assumption was that the creative process despite its complexity can be made available to reflective study and this is supported by the lines of enquiry I have articulated and traced through the published writings (for example: the link between dance drawing-making as continuous internal and external processes and the notion of the “thinking body” tracked through recent history). It should be clear how some aspects of my research are not possible to separate from that of my collaborators since our research spaces are mutually informing. The fact that creative process in contemporary dance has provided the topic of mutual interest supports my second theoretical assumption regarding inter-disciplinary collaborative research. My third assumption holds because working closely and productively with individuals and groups from diverse fields and practices, has made it clear to me that what qualifies as knowledge is at least in part dependent on what is emergent at the interface of shifting social relations. And publications Nos. 27 and 30 firmly demonstrate that a

²⁴ I acknowledge here the major influence on my discourse about inter-disciplinary collaboration of James Leach, currently Senior Lecturer in Social Anthropology and Head of Department at the University of Aberdeen. Leach was a close collaborator on ‘Choreography and Cognition’ and more recently the ‘Choreographic Objects’ project: <http://projects.beyondtext.ac.uk/choreographicobjects/index.php> (accessed 7 May 2010).

practice-led artistic research into the creative process of contemporary dance does not have to result in the production of texts or works of art to be engaged in materializing research outcomes. The four choreographic resources projects cited in No. 27 involve the creation of unique formats for bringing choreographic ideas and processes into productive new relations with both general audiences and other specialist practices.

Looking to the future, the resources described in that article have since materialized into valuable 'boundary objects', now engendering inter-disciplinary collaborative exchange in a variety of research contexts.²⁵ One of these research contexts, 'Choreographic Objects: traces and artefacts of physical intelligence', involved a series of workshops centring on the variety of resources the research teams are developing with the four choreographers.²⁶ The workshops drew attention to the teams' work as an emerging "community of practice" (Wenger & Snyder) and began to contextualize and frame what may begin to constitute a unique body of knowledge pertaining to contemporary dance.²⁷ This research will continue as new partnerships and opportunities come into view.²⁸

²⁵ 'Boundary objects' in sociological studies are seen to be constructs that support working relations between different groups. They are "adaptable to different viewpoints and robust enough to maintain identity across them" (Star & Griesemer p 387)

²⁶ These include on-line interactive scores (<http://synchronousobjects.osu.edu/>) and archives (<http://www.siobhandaviesreplay.com/>), interactive training installations (<http://insidemovementknowledge.net/context/background/capturing-intention>) and unique notation instruments (http://www.randomdance.org/r_research/current_projects1) (all accessed 7 May 2010)

²⁷ This 2008-2009 project brought the four projects together in the same investigative context with social scientists specialising in object making. It was funded by Beyond Text, a strategic programme created by the Arts and Humanities Research Council, UK, to generate new understandings of, and research into, the impact and significance of the way we communicate. Final report on-line at: <http://projects.beyondtext.ac.uk/choreographicobjects/index.php> (accessed 7 May 2010)

²⁸ For example, funding has been obtained in Germany from both the Volkswagen Foundation and the Federal Cultural Foundation for a four year project which I currently co-direct to continue the development of 'choreographic resources' in an international context.

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