

Process Documentation with the Australian Dance Theatre

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Title: Exploring Creative Thought in Choreography Together: Process Documentation with the Australian Dance Theatre.

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Thomas Fonua. November 2016 Thinking Brains and Bodies studio research with the Australian Dance Theatre. Adelaide. Image courtesy of Australian Dance Theatre.

The Australian Dance Theatre (ADT) is a contemporary dance company based in Adelaide, South Australia.[i] First established in 1965, ADT is Australia's oldest continuously running contemporary dance company. Choreographer Garry Stewart has been ADT's artistic director since 1999, and has created many works for the company that have garnered awards and international acclaim. Past works have involved robotics, film, and 3D scenographic backgrounds, overlaid with the company's signature movement style. Stewart is known for his collaborations with artists working in other fields and for being inspired by a wide range of ideas and sources of information including literary, philosophical and scientific. He selects 'dancers who demonstrate strength, dexterity, confidence and a physical understanding of the body and how to use it' (Lasica), capacities Stewart stretched conceptually and artistically with the work *Be Your Self* (2010) which the neuroscientist Ian Gibbins worked as consultant on.[ii] Gibbins also consulted on *Proximity* (2012) and took part in a panel Stewart invited to discuss 'the art and science of movement' at the Adelaide Festival of Ideas 2013. This panel included cognitive psychologist Catherine Stevens with whom Stewart had been discussing the possibility of collaborative research with ADT, resulting in the launch in February 2014 of a three-year interdisciplinary research project titled *Thinking Brains and Bodies: Distributed Cognition and Dynamic Memory in Australian Dance Theatre*.[iii]

Thinking Brains and Bodies brought together a team of six researchers spanning cognitive science (Catherine Stevens, David Kirsh), cognitive neuroscience (Mike Nicholls), dance (Kim Vincs, Elizabeth Old, Scott deLahunta), and social anthropology (James Leach) to work in close collaboration with Garry Stewart and ADT to address research questions concerning embodied cognition in real-world and experimentally controlled settings. A handful of studies on topics ranging from memory and distributed creativity to perception and proprioception were developed and carried out over the course of the project informed by the following questions: How does collaboration between dancers as they improvise impact creative thinking and what is the time-course of idea generation? How are complex action sequences learned and retained over the long-term? Is the relative influence of the somatosenses, such as touch and proprioception, elevated in dancers?

To begin the project and prepare for these studies Stevens, Leach, Vincs and deLahunta recorded four 'cognitive interviews' with Stewart, ADT's Associate Artistic Director Elizabeth Old, and the dancers working in the company at that time. The goal of these interviews, all conducted in February 2014 at the ADT rehearsal studios in Adelaide, was described in the original proposal as aiming to 'yield a model of knowledge, processes and tasks in ADT and identify examples of specific tasks for later studies' (Stevens et al 2014). The original goal of the interviews was thus guided by the scientific research motivations of the project, and not intended to achieve the collaborative hybrid outcome that was to emerge.

Between Choreography and Cognition

This chapter is in part about the research project *Thinking Brains and Bodies*, and in part about a relatively small group of discipline-crossing practitioners who have been bridging the space between cognitive science and choreographic practice for nearly fifteen years, captured in the short descriptions below of two long-term projects, one in Australia and one in the United Kingdom. The key feature distinguishing these projects from others involving scientists studying dance or dancers interacting with scientists was the pursuit of one key topic of mutual interest. That was, as Shirley McKechnie and Robin Grove write on the first page of their Introduction to *Thinking in Four Dimensions*, 'to explore the kinds of creative thought involved in choreography' (Grove, Stevens & McKechnie 2005: 1).

Thinking in Four Dimensions: Creativity and Cognition in Contemporary Dance is a publication communicating the work of a multidisciplinary team of cognitive psychologists, dance scholars and artists investigating the psychological processes involved in creating and performing contemporary dance. One of the main architects of the project, Shirley McKechnie, a seminal figure in Australian contemporary dance and education, together with scholar Robin Grove, cognitive psychologist Catherine Stevens and dance artists including Anna Smith and Sue Healey, raised funds from the Australian Research Council and Australia Council for the Arts in support of three major research projects spanning nine years. The first, *Unspoken Knowledges* 1999-2001, systematically studied and analysed the creation of new works and resulted in the publication of several articles in both science as well as cultural journals (e.g. McKechnie & Grove 2000; Stevens, et al. 2003). The second, *Conceiving Connections* 2002-2004, measured and analysed how audiences respond to contemporary dance. Outputs included several journal articles (e.g. Stevens & McKechnie 2005) and the publication of *Thinking in Four Dimensions*, based on the research results from both projects (Grove, et al. 2005). A third project, *Intention and Serendipity* 2005-2008, focused on processes of dance improvisation and the nature of dancers' memory for movement material and outcomes included the creation of new dances as well as journal articles (e.g. Vincs et al. 2007). One of the results of the first project, an article titled 'Choreographic Cognition: The Time-Course and Phenomenology of Creating a Dance' (Stevens et al. 2003) reported in detail on a nine-month study of the creative work of choreographer Anna Smith.

Documentation methods, theoretical models (specifically the Geneplore model of creativity Finke et al. 1996), analytical tools, general principles at work in the context of individual creativity and ideas for innovation in empirical methods to examine contemporary dance are all discussed in this seminal publication.

Around the same time, the London based choreographer Wayne McGregor and arts researcher Scott deLahunta initiated *Choreography and Cognition*, a research project that began in 2003 and aimed to engage practitioners from the field of cognitive science in seeking connections between creativity, choreography and the scientific study of movement and the mind. With joint funding from the Arts and Humanities Research Council and Arts Council England, they conducted a six-month pilot involving cognitive psychologists from the Medical Research Council and Universities of Cambridge and Birmingham. The outcomes included the publication of papers in science and cultural journals (e.g. deLahunta and Barnard 2005; Blackwell et al.), several public presentations and the creation of a major dance work (see documentation website for full list of outcomes[iv]). In addition, James Leach was invited to take part and assess the interdisciplinary interactions from an anthropologist's perspective (Leach 2006). In the years that followed, McGregor and deLahunta continued to work with participants involved in the first project and forged new research relationships with artists and scientists to continue collaboratively researching creativity in the context of the company's artistic work. In 2009, they established a research department (R-Research) inside McGregor's dance organisation to manage these relationships and associated research projects defined by three main lines of collaborative enquiry: studying the use of imagery in the generation of movement material; investigating the distribution of cognition in the creative process; and developing an artificially intelligent software to generate new movement ideas for the dancers to explore. R-Research was also responsible for the dissemination of research results through publication and public seminars. This work culminated in 2013 with *Thinking with the Body* a six-week public exhibition[v] at Wellcome Collection in London, which aimed to provide the public with the chance to learn about the history of this shared enquiry into dance-making and the impact it had in the rehearsal studio.

From 2010-2014, four of the main researchers involved in these two decade-long projects, who would also participate in the ADT research *Thinking Brains and Bodies*, deLahunta, Leach, Stevens and David Kirsh, came together in the context of Dance Engaging Science which was part of the Motion Bank project in Frankfurt[vi]. The goal of Dance Engaging Science was to: (1) survey the current state of the field of interdisciplinary dance-science research; and (2) lay the foundations for future interdisciplinary research in which dance itself plays a greater constitutive role. A main workgroup of senior researchers and associate researchers including dancers came together with special guests for three key meetings organised in May 2011, February 2012 and September 2012. All the scientists and scholars participating had engaged in some form of collaborative research with dance in the past. Following the three

meetings, the group members embarked on a number of pilot collaborative research projects resulting in a handful of funding applications, many of which were successful including the Australian Research Council application for *Thinking Brains and Bodies*.[vii]

Collaborative Design at the Intersections

These projects reveal the potential of an interdisciplinary laboratory, bringing together practitioners from scientific, artistic and scholarly disciplines with a mutual interest in the relationship between mind, body and movement in contemporary dance. They reveal ways in which this relationship can be explored, articulated, understood and shared through collaborative investigation. They show the possibility for the systematic study of creativity in dance, for example, through applying methods and theory from cognitive science. A major part of the output has taken the shape of written texts from articles in science journals to essays reflecting on studio-based processes. More ineffable but no less tangible outcomes are found in the form of new dance pieces, emerging from the time spent together influenced or supported by the research[viii], whether in the context of experiments or in conversation. As part of his assessment of *Choreography and Cognition*, Leach reported that its collaborative research framework was set up to allow everyone to 'operate according to the requirements of his or her discipline (…) while never attempting a hybrid or common product' (2006: 448).[ix] For this particular project with McGregor, most of the scientific activities took place embedded in the day-to-day studio based activities of the company; 'An essential element of this (…) was that the choreographer, the dancers and the scientists were very much equal partners with everyone included in one form of dialogue or another, and all parties tended to come away with material that they found useful for their own practice.' (Barnard and deLahunta forthcoming) This tends to hold true for other collaborative projects when there is a diversity of scientific perspectives and approaches involved and, as a result, the choreographer and dancers are engaged with multiple forms of data collection including feedback about what was learned from those empirical observations.

Where more hybrid or common products did emerge from the collaborative research McGregor and his company was in the form of concrete outcomes involving the augmentation or enhancement of creativity in the studio, via a built for purpose tool, process or object, or communicated for research or education purposes.[x] These products are interesting because of the way in which they show traces of collaborative design (co-design) that go further in terms of integrating the separate starting points of the research in more fundamental ways. Understanding how this co-design takes place requires a closer study of the interdisciplinary collaborative processes themselves. However, throughout these projects, except for the assessment by Leach and an article on the role of facilitation within these collaborations (deLahunta 2006), relatively little has been written about the workings of these interdisciplinary collaborations as co-design processes. There is plenty of description of experimental set ups[xi] that include global comments such as how long it takes (12-18 months) 'to identify and articulate common goals, methods and questions (Stevens cited in Crampton 2005: 189). One

comes across notes about finding the right cooperative fit with individuals and institutions, e.g. 'the collaboration with MARCS proved of extraordinary benefit' (McKechnie and Grove 2005: 2), a list of 'seven principles' to keep in mind when setting such collaborations up (deLahunta 2014), and reflection on how fully involving the artists and audiences as collaborators in this research results in people more likely to 'embrace this empiricism' (Sutton 2005: 51).

A closer study of the collaborative mechanisms themselves reveals an iterative process of design lying at the core of both practices that involves taking complex and specific knowledge from different domains and working closely together to produce shared (in the sense of taking credit for), but also separate outcomes as previously described. Design iterations move along various cyclical process pathways, e.g. selections and modifications follow evaluation and assessment. These cycles need to be seen within the overall context of shared making (or producing), which moves along other pathways in time from sources of inspiration, background information and/ or theory to some type of output rendered/ produced as artwork, written text or creative tool. In these interdisciplinary research collaborations, productive intersections between disciplines occur frequently along these pathways, but it is difficult to make visible how ideas at these junctures start to take shape and grow, particularly if the final output, e.g. an artwork, does not assume the written form more common to science practice, which would account for ideas development through experimental method and design descriptions.

On the other hand, the challenge of accounting for, making tangible or visible potential insights derived from these intersections (vis-à-vis co-design iterations), does not just affect the arts practice side of the spectrum. It is possible that the fundamental assumptions of the disciplines or particular practices involved are called into question precisely at these intersections, disrupting normative pathways towards output or production. Such disruptions could inspire shifts in thinking, and finding a means of tracing what occurs there and further along these pathways would seem to be important to the overall valuation of these kinds of research collaborations. This would allow for a divergence of both input and output, and still establish concrete evidence of shifts in thinking and changes in approaches informed by the collaboration. It might help to 'identify how specific classes of knowledge are used and transformed not only within the arts or sciences but also when arts practice is informed by science or when arts practice informs science' (Barnard and deLahunta forthcoming) and perhaps assist researchers faced with requirements to make the impact of their research tangible.[xii]

The account that follows reflects on the concept of 'process documentation' with the Australian Dance Theatre, a project that was not anticipated in the original research proposal for *Thinking Brains and Bodies*. It does so with the aim of drawing attention to the various iterations and progress in design toward the collaborative creation of a more hybrid product – in this case the enhancement of educational materials ADT with more

information about the creative processes involved. This will address two related ideas: firstly to point toward the documentation of complex creative processes in dance informed by science (from past projects as well as the current) and secondly to consider evidence of co-design processes within the current project.

Four Cognitive Interviews

As previously noted, in February 2014 at the start of the three-year interdisciplinary research project with ADT, *Thinking Brains and Bodies,* project researchers Stevens, Leach, Vincs and deLahunta recorded four interviews with ADT company members. The goal was to 'yield a model of knowledge, processes and tasks in ADT and identify examples of specific tasks for later studies' (Stevens et al. 2014). The first was a general discussion for nearly one and a half hours with Artistic Director Stewart, Associate Director Old and the eight dancers working for the company at that time (Kyle Page, Amber Haines, Samantha Hines, Kimball Wong, Matte Roffe, Jake McLarnon, Scott Ewen, Zoë Dunwoodie). Joining the conversation was cognitive neuroscientist Mike Nicholls, also collaborating on the project. The discussion was relatively unstructured, but guided by the cumulative experience of the researchers, in particular those who knew each other from working together on previous projects. As the kick-off conversation for the three-year project, this was the opportunity for introductions and explanations. Some familiar topics in dance making were explored at the outset, for example tasking[xiii], the use of imagery and problem solving in the studio. Previous dance-science research projects were briefly discussed, and the scientists each gave a short account of their research questions and approach. Stevens spoke about how, as a cognitive psychologist, she studies behaviour, 'by setting up experiments, by manipulating variables or factors, and then (…) compare things.' Leach briefly described his work on creativity in Papua New Guinea where no one claims 'individual creation', but creativity is 'embedded in relationships between people.' Nichols talked about 'transmission times through the body' in terms of milliseconds, how it takes longer to 'feel something with your foot than with your hand.' Stewart, Old and some of the dancers spoke about what they hoped to get out of the project, e.g. an interest in transparency around experiments and specific ideas to explore in future creations, and some conversation about logistics followed.

The next two interviews were done individually first with Garry Stewart followed by Elizabeth Old both around an hour in length. In part, as preparation for their planned studies of distributed cognition and creativity and long-term memory[xiv], Leach and Stevens took the lead role in interviewing Stewart. The questions focused on material and vocabulary, what comes first in the process, clarification about how scenes are initially developed in the imagination and what needs to be realised with the dancers in the studio. Other key topics were how to solve problems when material is not matching or working well together, what drives decisions about the value of the material and its co-ownership, and mediating ideas through the body. On the following day, Leach and Stevens again took the lead in the interview with Old. Topics and questions included how she works with the dancers on tasks given by Stewart and the use of imagery and

other techniques when doing so. Another topic was documentation, note taking and the role of visual triggers in remembering material. The interview with dancers was conducted without Old or Stewart present. This was a free-ranging discussion facilitated by deLahunta during which similar subjects were discussed with the dancers covering research and starting points, creation of material and distribution of labour, documentation and memory, performance and audiences.

Although not in the original research proposal, it was decided that the rich content of these three interviews could be useful for developing a protocol for documenting the creative process of a new work. ADT had established a practice already of developing Teaching Resources[xv] for secondary school teachers, which included Education Notes, written by Old, and accompanying DVDs. At the start of the research project, Old had expressed an interest in augmenting these resources with additional information about the creative process. The three interviews had already been transcribed and in March 2015, these were analysed for similar patterns and connections. Extractions from the interviews revealed consistent terminology, which might function as labels, and other regularities in the process as well as information about where inspiration might come from (readings, etc.) and recording media (notebooks, video, etc.) used in the studio. In November 2015, these patterns were loosely filtered through three models, or 'analytic lenses' developed by Phil Barnard and deLahunta during the period of time they worked with the dance company of Wayne McGregor (deLahunta and Barnard forthcoming). These lenses are designed to probe and notate creative processes in dance drawing on cognitive theory.[xvi] The aim of developing these was to enrich descriptions of creative processes in dance practice initially with a view to develop augmentations or enhancements of the practice. These lenses eventually supported the development of the hybrid products of the collaboration with McGregor and his company mentioned earlier; and thinking and writing about them has helped to inform the closer study of iterative co-design in art and science research. (Barnard and deLahunta forthcoming)

Process Documentation Protocol

Using the models developed by deLahunta and Barnard as guidelines and the analysis of the cognitive interviews, two separate documentation protocols were developed. Both went through minimal design iterations with feedback from Stewart and Old. The first was intended to be a simple collection procedure to gather material that might be later developed into transmittable (or publishable) 'small packages' that can share or communicate parts of a creative process for a new piece the company is making. With the goal to augment existing Teaching Resources, these 'small packages' should give audiences a partial 'window into the studio' during creation. The protocol was meant mainly for the purpose of guiding the documentation of process (any editing and production of material for online publishing would need further discussion and development). The protocol focused on six different topics: 1) Inspiration; 2) Input/ Instructions; 3) Discovery (material unknown) or Learning; 4) Material/ Outcomes; 5) Dancers and 6) Modalities & Media. These categories were not meant to be overly

complicated and a sample table was created as a way of illustrating how relationships between different topics might start to go together; how you might start to form a trace from a source of Inspiration or concept to some kind of task or Instructions derived from the inspiration (perhaps developed by Stewart or Old or the dancers themselves from a text or other source) to the Discovery process (where new movement material is generated or learned) to the selection of this as Material or Outcomes which may or may not end up in the finished work. Naming the Dancers involved creates an index for collecting additional insight through future interviews.

Modalities & Media is a category referring to the documentation normally occurring in the creation process, for example what is recorded on digital video and added to the company's media library, the use of a whiteboard to list names of phrases and sections and a 'readings box' storing copies of source material and individual notebooks. ADT keeps a well-organised library of video clips of material considered worth saving on the media server and a computer with screen in the corner of the rehearsal studio. All the dancers know how to upload, name, store, access, and search for material on this computer. It is also connected to the Internet enabling quick look up of concepts or imagery from other sources.[xvii]

The second protocol was developed to aid in the documentation of 'assembling', the term Stewart uses for 'bringing things together.' These ideas came from the original 'cognitive interviews' (February 2014), and a follow-up conversation with Stewart on 3 December 2015. Assembling would not be as simple to document as the phase of the creative process covered in the first protocol, when there are generally more tangible contents such as inspiration sources, input/ instructions and the movement material that gets made and added to the library of video clips. This first phase tends also to involve the individual dancers more in reading and studying (absorbing) various inspiration sources, interpreting them in the context of tasking and developing movement material. The assembling phase shifts the focus toward Stewart, toward what is going on 'inside his head' and how he is engaging with his collaborators, particularly the composer. At the time of the interviews,[xviii] there seemed to be three key aspects associated with the concept of assembling; proposals for documenting these follow each description below:

1) There is a kind of pre-phase that involves bringing together something like 'scenes' (February 2014) or 'conceptual nodes' (December 2015) in mind. According to the earlier interview, this happens before movement rehearsals, during the 'thinking, research phase.' It is part of how Stewart begins to get a feeling for the work's 'tonality', its essence. It is not clear if or when these scenes may start to become a sequence, but they are interesting because they seem to function to 'bring together' movement material with scenography, music, etc. This implies the scenes do some of the work of assemblage. The proposal for documentation is to interview Stewart further on this

topic, however much of this part seems to exist in a state of feeling, senses and intuition, so it is not clear what can be made explicit.

2) 'The universe of the work' (February 2014 and December 2015) is a critical concept in the creation process. When this comes together, one of its key functions is to help determine what fits into the piece and what does not. This often coincides with the time Stewart feels that the company has made enough movement material; that there is a 'full palette' from which to work. This seems to happen before the work starts to be sequenced. It appears there may be during this stage (before sequencing) the development of a graph of the 'energy' of the work, in part to communicate to the composer and/ or other collaborators, and this graph may represent the temporal frame of the work as Stewart is imagining it at that point. The proposal for documentation of this part of the process is to interview Stewart and the other collaborators who are also thinking about this 'universe' as a way to guide their creative decisions. The graph and any other drawings or representations used to communicate with collaborators could be copied and collected.

3) When sequencing begins, it may involve something like a list of movement phrases that have been created which Stewart tries out with the dancers. The initial list probably comes from imagining what might work together in what order, but once he starts to see this sequence in the studio this starts to show him what transitions need to be made, which parts need to be longer, shorter, etc. In the December 2015 interview, Stewart says that in sequencing events, music helps 'conjure images', but it is the 'dramaturgical sense of order that is primary.' Stewart does not tend to video this work and according to the dancers makes changes quickly, challenging them to keep these in memory. Elizabeth Old is likely to be keeping extensive notes during these sessions; eventually she will probably produce 'scores' that can be used by all involved in the production (February 2014 Interview). The proposal for documentation of sequencing is to see what Old and the dancers are keeping in their notes, copy some of these, and also make copies of Stewart's initial lists and notes. Interviews with the dancers, Steward and Old, could help reveal how they understand the adaptations to and discarding of movement material created in the first phase to start fitting into the whole.

In the Education Notes for *Proximity* (February 2012), *Be Your Self* (February 2010), and *G* (2008) written by Old, there are a lot of clues that might be aligned with the above aspects: each Education Note contains information about the pre-phase sources of inspiration and information; details about working with collaborators in *Be Your Self* and *Proximity* assist making inferences about the 'universe of the work' and some sequencing is explained for *Be Your Self*. However, this explanation addresses the final sequence, which makes it challenging to know the pathway through the candidate sequences that were discarded. Documenting the assembling process as proposed above might capture in particular how things change over time and what those mediators of change might have been.

Further Development

On 25 May 2017, deLahunta interviewed Old to find out how she had progressed with the process documentation of *The Beginning of Nature*. Some key aspects stood out. It is common practice for Old to document as much as possible during the creative process in order to facilitate finding material again, checking, learning from others, clarification of tasks, drafting final scores, etc. One difference she felt, after developing the process documentation protocol described above, was having the aim to give the public access to selected parts of this documentation to gain an insight into the creative process. She said this made her look at the process differently. Old also said she began to record snippets of material that the dancers reported were not ready to be recorded for storing on the media server, what she referred to as 'little gems of ideas' that show up sometimes before something is considered ready for digital storage. Old also said she has been thinking more than usual about what is going on 'in the mind of the maker' (Stewart) as she has been writing the Education Notes, perhaps the result of the exposure effect of working alongside cognitive scientists. To date nothing has been published online, in part because of waiting for ADT to launch their new website which they would like to use as the platform for this material.

Old has recently embarked on an MA by Research at Deakin University.[xix] In her research proposal she writes that in her opinion, most of the existing process publications (e.g. Choreographic Objects – see below) are developed for specialists, and they are 'designed for those already invested.' She would like to focus on reaching general audiences in her research, which will include looking at how to publish 'annotated choreographic development processes.' Old hopes to design a pilot audience development strategy with Australian Dance Theatre using digital media as a platform and make the findings of this research available to leading industry dance makers and arts programmers (Old 2017).

Prototypical Exchange Objects

The process documentation protocol prepared for ADT coincided with the creation of two works, *Habitat* (premiered February 2016) and *The Beginning of Nature* (premiered March 2016), and Old planned to use the protocol to document these two processes with the view to publishing the results online as a pilot, providing a partial 'window into the studio.' Inspiration for this came in part from a small number of ambitious initiatives of dance artists and their companies working with interdisciplinary teams 'to bring choreographic ideas and processes into newly productive exchanges with both general audiences and other specialist knowledge areas.'[xx] The resulting Choreographic Objects, the term associated originally with these initiatives[xxi], have been analysed by James Leach as 'prototype exchange objects, prototypes that are experimenting with (…) the visibility and presence of contemporary dance in other spheres (disciplines, sectors and audiences)' (2014: 471). In Leach's analysis, this extension of choreographic practice to prototypical exchange is in part achieved 'through collaboration with other disciplines, and utilising new technologies' to recast relations with audiences (462). Prototypes, he

writes, 'draw actors and people into technical endeavours in compelling ways' (460), but they are meant to be experimental, to a degree unpredictable, for probing and discovering things not already known. The notion seems to fit to the idea of the process documentation developments with ADT, in part because of the collaborative design context from which it evolved, the *Thinking Brains and Bodies* interdisciplinary research project; itself an evolution over time and emergent from a decade of previous research that began, as Grove and McKechnie wrote in the introduction to *Thinking in Four Dimensions* as 'a strange enterprise, to investigate choreographic thinking'. (2005: 2)

Conclusion

The goal of the process documentation research with ADT was to peel back layers of understanding, and in doing so it folded one process of enquiry into another and drew upon and integrated approaches developed with other artists and research collaborations. Therefore, rather than looking at ADT in isolation, this chapter has included previous projects in its narrative about collaborative interdisciplinary research into creative process in dance beginning in Australia with *Unspoken Knowledges* in 1999, the same year Stewart became ADT's artistic director. The article 'Choreographic Cognition' (Stevens, et al. 2003), one of the outcomes of *Unspoken Knowledges*, chronicled 24 weeks of research into the creative work with the choreographer Anna Smith. At the time, this research had the feeling of novelty and newness, drawing attention to the idea that contemporary dance 'has been largely neglected by cognitive psychology' (298). The article points toward the richness of dance as a 'highly complex instantiation of human cognitive processes' (299), describes the adaption of existing methods of analysis to better accommodate creative process in dance (312-313) and makes evident the challenges for scientists studying contemporary dance. Two years later in her chapter on 'Trans-disciplinary Approaches (…)' (2005), Stevens picks up on these challenges by calling for new and diverse methods 'to investigate and explain the complex psychological processes that underpin creation, performance and appreciation of contemporary dance' (154). Her proposal at that time was motivated by the potential of deeper interdisciplinary scientific probing of dance, awaiting the 'specification of detailed and integrated theories from which precise, testable hypotheses may be derived' (168). This is something the most recent research with ADT has demonstrated, for example, through the mixing of anthropological and psychological methods in the planned 'Study 3: Locus of Creativity' (Stevens 2014: 4; Stevens and Leach 2015).

This chapter, however, has been written from the perspective of an unintended collaborative hybrid outcome, which was not part of the original research proposal. An outcome that includes protocols for documenting a specific creative process, the collected data itself and the planned publication of enhanced ADT Teaching Resources (possibly on-line). There were other hybrid results emerging from *Thinking Brains and Bodies*, for example the ADT company were co-developers of the experimental design for two of the four other studies, long-term memory and time course of creativity. [xxii] With these examples in mind and the experience of the last decade of dance and science

research projects, it seems possible now to recast the interdisciplinary approach as more inclusive of and collaborative with participating artists. Perhaps the request for more 'transparency around experiments' expressed during the first ADT interview in February 2014 is indicative of how dance artists desire a larger role in co-designing the experiments they are participants in. Whether this is a result of artists having been exposed to the last fifteen years of research described in this chapter is difficult to say. In any case, more adequate ways of tracing research along these collaborative design pathways (diachronically and synchronically) to show its value and impact are required. Perhaps with improved instruments for tracing and auditing interdisciplinary processes, as suggested in this chapter, and concepts for critique and comparison such as prototype exchange objects, arguments could be made for investment in 'exploring creative thought in choreography (and science) together' with more room for collaboration that generates and valorises the unexpected.

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[i] https://www.adt.org.au/education/ (accessed 31.08.17)
[ii] http://www.realtimearts.net/article/issue94/9637 & conversation between Stewart & Gibbins http://www.iangibbins.com.au/projects/australian-dance-theatre/a-conversation-with-garry-stewart/ (accessed 31.08.17)
[iii] This research was supported by the Australian Research Council (ARC) Linkage Project scheme (LP130100670)
[iv] http://choreocog.net/ and http://choreocog.net/report.html (accessed 31.08.17)
[v] https://wellcomecollection.org/thinkingwiththebody (accessed 31.08.17)
[vi] http://motionbank.org/en/content/dance-engaging-science (accessed 31.08.17)
[vii] For documentation of these results: http://motionbank.org/sites/motionbank.org/files/projects_table_fin_grpx.pdf (accessed 31.08.17). Several key researchers crossed paths with these initiatives, including Ivar Hagendoorn (prolific writer of articles related to how insights from science can inform dance practice in science publications and organiser of 'Dance and the Brain' hosted by the Ballett Frankfurt in January 2004) and Bettina Blaesing a cognitive neuroscientist who was a key organiser of international conferences and publisher of dance-science related research at the University of Bielefeld, DE (e.g. 'Intelligence and Action – Dance in the Focus of Cognitive Science' 1-3 and follow up to Dance Engaging Science April 2015).
[viii] 'In conversation, Anna Smith said she believed the experience of choreographing *Red Rain* enabled her to change the way she worked. It allowed for a process of inquiry and exploration with the dancers, assisting her to break through habitual patterns.' (Crampton, 2005: 191)
[ix] This assessment refers to the *Choreography and Cognition* project with Wayne McGregor and was written by James Leach as part of a longer article covering the Arts and Science Research Fellowship pilot projects in the UK.
[x] These results include the Choreographic Language Agent (deLahunta 2016), Becoming (Leach and deLahunta 2016) and Mind and Movement (McGregor et al 2013)
[xi] E.g. http://choreocog.net/exper.html (accessed 31.08.17)
[xii] To try and deal with this challenge of representing the progressive results of this kind of interdisciplinary collaboration, Barnard & deLahunta have recently begun to explore the concept of the audit trace in 'bridging and blending in science and art' (forthcoming).

[xiii] The term 'tasking' is in common use as evidenced in the accounts of prior creativity in dance research, and is described in detail in the Education Notes for *Be Your Self* (2010: 11): 'tasking is a method by which ideas drawn from research are made into dance.'
[xiv] Distributed Cognition and Creativity: Effects of Collaboration and Familiarity on Improvising Contemporary Dance & Long-Term Memory for Contemporary Dance is Distributed and Multimodal.
[xv] https://www.adt.org.au/education/ (accessed 31.08.17)
[xvi] One of these is the Performance and Concept Tracking (PACT), which is effective in clarifying 'properties of conceptualisation and means to realise it' and enables structured reflection and facilitates accessing information about the process through tracking changes over time and what mediates them.
[xvii] In the interview with the dancers in February 2014, one of the dancers wondered about the different quality of movement that might be learned and remembered without such an extensive and well-organised external storage.
[xviii] It is important to add that artists change methods of working frequently, only very general principles may hold over a period or body of work. Even these may change.
[xix] Elisabeth Old has begun an MA by Research at Deakin University on the topic of 'A study in effective methods of audience development.' As a part of this she intends to: 'research an effective model for publishing annotated choreographic development processes and curated video of creative practice.'
[xx] http://projects.beyondtext.ac.uk/choreographicobjects/ (accessed 31.08.17); William Forsythe's Synchronous Objects, Siobhan Davies Replay, Emio Greco|PC's Capturing Intention; Wayne McGregor's Choreographic Language Agent.
[xxi] Choreographic Objects is also the term William Forsythe uses to refer to his installation work.
[xxii] Draft articles are in development: Stevens, Catherine, deLahunta, Scott, Vincs, Kim and Old, Elizabeth 'Long-Term Memory for Contemporary Dance is Distributed and Multimodal'; Kirsh, David, Stevens, Catherine and Piepers, Daniel W. 'The Time Course of Creativity in Dance'.