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‘Choreography and Cognition: A joint research project’

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In February 2004, I received the invitation “to submit a four-page paper” for the proceedings of the Empirical Aesthetics Conference from Sydney-based cognitive psychologist Kate Stevens who had convened and invited me to participate in the symposium "Choreographic Cognition" to be held at the Conference in Lisbon Sept 13-16, 2004.[1] The panel provided a first opportunity to interact with the significant body of research work Stevens and her colleagues had been conducting in Australia titled ‘Unspoken Knowledges’ on topics very similar to mine.[2]

[1] Email to the author, 25 Feb 2004
[2] Documentation site: http://www.ausdance.org.au/unspoken/background.html (accessed 7 May 2010).

CHOREOGRAPHY AND COGNITION: A JOINT RESEARCH PROJECT

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Introduction

The Choreography and Cognition project began a few years ago as a discussion between London-based choreographer Wayne McGregor (director of Random Dance) and myself about finding new ways of understanding the choreographic process that might lead to alternative creative and collaborative approaches to making dances. Starting from a mutual interest in artificial intelligence, our discussion eventually led us to develop a project for exploring potential insights into the choreographic process that might emerge from the interdisciplinary research context of cognitive science. For Phase One, we organised a series of meetings in November 2002 with cognitive scientists in the United Kingdom and France. Positive reactions to these inspired us to continue with another set of exchanges, and we were able to secure funds from a new arts and science research scheme that enabled us to continue working with five of the individuals from our original series of meetings. (1) In addition, we invited James Leach, a social anthropologist doing fieldwork on creativity and knowledge exchange within the context of arts and science collaborations. This Phase Two was planned as a six-month project from September 2003 to the end of February 2004. (2)

Project Objectives/ Initial Meeting

In preparation for Phase Two, we developed three objectives intended to establish the conditions out of which specific lines of enquiry or starting points could emerge.

1. shared objective: to seek connections between choreographic processes and the study of movement and the brain/ mind that are scientifically and artistically interesting.

2. artistic objective: to integrate the participation and contribution from the scientists into the fabric of the choreographic process while maintaining the integrity of the modes of looking and questioning pertaining to their respective research areas.

3. scientific objective: to start to formulate specific questions and research methodologies that arise from the individual interests in this project in the context of the creative choreographic process.

On 7 and 8 November 2003, we met together in the Random Dance rehearsal studio in London to witness McGregor and his dancers work with some new exercises and scores to generate movement material. Our schedule consisted of watching these making sessions in the morning and holding discussion sessions in the afternoon during which the scientists were invited to present responses and questions to what they had seen based on their individual areas of research. We had set aside two weeks in December and one week at the end of January when they could return to the studio to continue whatever line of questioning might have emerged for them; and we were aiming by the end of the second day for some starting points for potential experiments. At the same time, McGregor was working on the integration of some of their approaches into his creative practice.

Project Experiments

Alan Wing and Kristen Hollands from the Sensory and Motor Neuroscience Centre, University of Birmingham took as their starting point a broad set of questions such as: what frames of reference are dance movements controlled in? Are the movements guided in space with respect to features of the room or with reference to the midline of the body? What are the crucial sensory systems for describing these frames of reference? How might selected disruptions or perturbations help to test this? In order to investigate these questions, four dancers learned and performed a movement sequence passing through three arbitrarily selected spatial reference points around the body. They were recorded performing these sequences using an optical motion capture system that records the timing and position of movement in a three dimensional space at a very high degree of resolution. Various disruptions or perturbations were introduced, e.g. performing with eyes closed and different parts of the body, at different speeds, in reverse and with mirrored and rotated reference points, etc. The collected

data has undergone a preliminary analysis that points towards some possible benefits ranging from: an increase in the scientific understanding of how movement is planned and executed; to offering an improved or enhanced understanding of how to encourage artistic variability of movement and expand movement vocabularies.

Dr. Rosaleen McCarthy from the Department of Experimental Psychology, University of Cambridge was also interested in the notion of disruption, but took a very different approach from Wing and Hollands. Her interest was in exploring the cognitive «toolkit» of each of the dancers in order to gain a better understanding of the communication taking place between choreographer and dancer in the context of the choreographic process. She posed the following questions: how does the choreographer stimulate the dancers' creativity along the desired lines? How do they understand what he says? Is creativity assisted or hindered by any tensions in communication? Drawing on her expertise in neuropsychological methods for the investigation of cognitive representations, she set up some simple dual task experiments with the dancers using imagined movement (in imagio) as a means of approaching these questions. Dual task experiments assume that if one does two things at once there is a general loss of efficiency in cognitive terms and a specific loss if there is an overlap in the tools required. By asking the dancers to imagine a short known movement sequence and timing them without any interference and then asking them to imagine the same phrase while performing varying tasks, e.g. haptic/ /spatial, verbal/spatial, static visual, etc. she began to gather information that may be useful to McGregor in communicating movement generating exercises differently to his dancers; i.e. what sort of instruction/stimuli he might choose to give and in what order, etc.

Tony Marcel and Phil Barnard from the Cognition and Brain Science Unit, Cambridge started with the premise that larger sequences of movement are constructed from smaller units. This makes it possible in the creative process to pull sequences apart so that components can be recombined. They wanted to investigate what the perceived units of movement would be in an experimental setup. Would perceived units differ for different kinds of viewers? Would perceived units differ for sequences generated under different instructions, for example lower level instructions (passing through points in space) versus higher level instructions (verbal/emotional)? In order to obtain reliable experimental measurements to relate to these questions, they asked McGregor to give the dancers two different types of exercises to generate very short movement phrases. These phrases were videotaped and from these recordings a total of eight were selected for viewing and «unitising» by McGregor and the

ten dancers. They recorded their individual responses (lengths and numbers of units) in data collection forms, which have since undergone a preliminary analysis. Based on what the dancers each perceive to be single units, some of the initial results give interesting indications about how perceptions can be compared in relation to different types of instructions for generating movement material as well as giving a comparative picture across the entire company. While it is noted that the experiment forces a more analytical viewing stance and does so in relation to limited scope movement sequences, interesting questions nevertheless emerge from looking at the results about what is and isn't noticeable, and this may be something that could contribute to the collective making process.

Alan Blackwell from the Computer Lab, University of Cambridge studies the cognitive dimensions of design and notation systems in collaboration with a research community who adopt analytic methods from a range of fields including experimental psychology and design research. He collected notebooks and scores from McGregor and four of the dancers and used some of these analytic methods to try and discover where they might experience the limitations of these design tools. The aim of this project is to see how McGregor might improve on the use of notations in the context of his creative process.

Summary

The data collected from all of these sessions is still being analysed and published papers are anticipated. Other forms of project documentation and analysis will be disseminated via a website in the near future, a further application for funding to continue the work has been submitted, and McGregor is premiering a new choreography in London in June 2004 that has been influenced creatively by the above exchanges. (3) What this project has effectively demonstrated so far is that a radical cross-fertilisation of ideas using shared research approaches can enhance innovative thinking in both choreography and cognitive science; and that connections can be discovered and sustained between choreographic processes and the study of movement and the brain/mind that are both scientifically and artistically interesting.

Endnotes

(1) The pilot Arts and Science Research Fellowships scheme was jointly funded by the Arts Council England and the Arts and Humanities Research Board.

(2) Phase Two participants: Alan Wing and Kristen Hollands, SyMoN, University of Birmingham; Rosaleen McCarthy, Department of Experimental Psychology, University of Cambridge, UK; Anthony Marcel and Phil Barnard; MRC Cognition and Brain Science Unit, Cambridge; Alan Blackwell of Crucible/ Computer Lab, University of Cambridge; James Leach, Research Fellow in Kings College Research Centre.

(3) Choreography and Cognition: http://www.choreocog.net; Random Dance http://www.randomdance.org.

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