I am the author of the thesis entitled

meta: discourses from dancers inside action machines

submitted for the degree of Doctor of Philosophy

This thesis may be made available for consultation, loan and limited copying in accordance with the Copyright Act 1968.

'I certify that I am the student named below and that the information provided in the form is correct'

Full Name: STEPHANIE ELISE HUTCHISON
(Please Print)

Signed: [Signature Redacted by Library]

Date: 7th December 2016
DEAKIN UNIVERSITY
CANDIDATE DECLARATION

I certify the following about the thesis entitled (10 word maximum)

*meta: discourses from dancers inside action machines*

submitted for the degree of Doctor of Philosophy

a. I am the creator of all or part of the whole work(s) (including content and layout) and that where reference is made to the work of others, due acknowledgment is given.

b. The work(s) are not in any way a violation or infringement of any copyright, trademark, patent, or other rights whatsoever of any person.

c. That if the work(s) have been commissioned, sponsored or supported by any organisation, I have fulfilled all of the obligations required by such contract or agreement.

d. That any material in the thesis which has been accepted for a degree or diploma by any university or institution is identified in the text.

e. All research integrity requirements have been complied with.

'I certify that I am the student named below and that the information provided in the form is correct'

**Full Name:** STEPHANIE ELISE HUTCHISON

(Please Print)

Signed: [Signature Redacted by Library]

Date: 10th June 2016
STATEMENT FOR EXAMINERS

INTRODUCTION

“EX-QUIRY” 8
‘EX-QUIRY’ IN POST MODERN AND CURRENT DANCE PRACTICES 10
THE CONCEPT OF THE ACTION MACHINE 11
SAFFOLDING 13
ROBERT DUNN’S COMPOSITION CLASS 22
A CONSTRAINTS-LED APPROACH TO MOTOR LEARNING 24
STUDIO-BASED PROCESSES AND PRACTICES OF EX-QUIRY 29
META 30

METHODOLOGY AND METHODS 31
PRACTICE AS RESEARCH 31
1. STUDIO-BASED PROCESSES | EXTERNAL FRAMEWORKS 36
2. SAMPLING AND PHYSICAL THINKING PROTOTYPES 37
3. ANNOTATION OF STUDIO-BASED PROCESSES 40
4. PERFORMANCE AND EXHIBITION 41

ACTION MACHINES 42
PROTOTYPES 42
MERCE CUNNINGHAM | LIFEFORMS 42
TRISHA BROWN | LOCUS 44
WILLIAM FORSYTHE | IMPROVISATION TECHNOLOGIES 47
ELIZABETH STREB | ACTION MACHINES 50
ACTIONING A CONCLUSION 54

PHYSICAL THINKING PROTOTYPES 55
WORK 56
Meta 59
Project Poser 61
META 63

CONCLUSION 68

BIBLIOGRAPHY 71

APPENDIX

USB – Folders: WORK, meta, Project Poser, METAinstallation&performance
WEBSITE | http://stephhutchison.com
STATEMENT FOR EXAMINERS
meta: discourses from dancers inside action machines

The installation and performance, META forms a constellation of many mobile referential platforms that together address new ways of making and knowing dance practice. In both modalities, I am attempting to weave together my research over the past 3 years and to bring forth concepts as samples of ideas I have both experimented with and experienced. These concepts have been developed in studio-based practice, in documentation processes, in conversations with other dancers, writings on my website, for conference papers, the exegesis, and within the thinking that takes place around, within and through all of these processes.

Within the installation, my intention is to make the investigation of the body visible across the writings on my website (stephhutchison.com), the interactive task-based ‘A Piece for Upper Body and Dots’, and the video screens that sample my Physical Thinking Prototypes (studio-based processes). In addition, the performance of META offers a further portal to the thinking surrounding my research. META mobilizes ideas across video, text, sound and body as I draw upon key Physical Thinking Prototypes that I have established throughout my research.

The Physical Thinking Prototypes, WORK, meta, and project poser, all offer a different perspective into my studio-based practice proposing new ways of thinking and moving. On the website under ‘Projects’ in the menu tab, you can find each of these prototypes listed and click through to find more information. Each of the Physical Thinking Prototypes emanated from the production of specific constraints, while working with concepts, that sought to elicit new or novel ways of moving / constructing new bodies in dance. Explanatory notes on META can be found in ‘PhD Research’ from the menu tab on the website. Here I discuss how I have constructed my research into the form of an event. What is fundamental to this investigation is the idea of sampling and creating a space that seeks out the history of the studio-based processes in multiple iterations – text, video and body. I specifically ask how can this multi-disciplinary approach convey key elements of the body-based investigation in writing, edited video, and also within my body?

The written exegesis examines studio-based processes in dance practice from the perspective of the dancer. My focus has been upon a unique interrogation of the concept of “ex-quiry” where dancers work with external frameworks such as scores, tasks, equipment and digital technologies in the process of developing movement material for performance. The “ex-quiry” concept proposes that in such processes dancers are not undertaking a process of pure inquiry – inside the body, but rather that their attention shifts between the internal and the external framework – that is located instead in an interstitial space between themselves and the external framework. Like a process of sampling in music, this creates cuts, grooves and riffs for experimentation with multiple ideas and materials that seek to elicit novel movement responses. The process of “ex-quiry” also gives rise to the idea of how bodies in dance might be constructed – how the studio-based processes affect the dancers body and direct their attention in specific ways. The nexus of “ex-quiry” has emerged from the
experiences I have had as a dancer and a developing theory surrounding the many diverse processes and practices I have engaged with, and just how they might be connected.

A salient example of my thinking surrounding ex-quiry can be found in an experience of serendipitously arriving in New York when the Trisha Brown Company were in the process of learning ‘Locus’. In September (2015) I was fortunate to be the only “outsider” in the first of a series of ‘Locus’ workshops and was able to share my interest in the work and be offered the opportunity to rehearse the work with the company over the coming weeks. As an external framework, ‘Locus’ was developed by Brown to share her ideas about dance, her way of moving and thinking with her dancers. Brown’s score for ‘Locus’ directs the dancer’s attention, through both the imagined structure of the cubes architecture and points in space and the autobiographical statement. ‘Locus’ directs the dancer’s attention in a way that promotes a 360-degree perspective of the body in motion and to a distal initiation of movement through the activation of space surrounding the body. This activation of the space surrounding the body via the initiation of movement from highly specific external points of the body, constructs the physicality of the dancer and promotes the relaxed/nonchalant attitude within the rest of the body. The instructions of the score carried out by individual dancers, directs their attention while maintaining agency of the performer and their individual identity as a human being. What can be garnered from structures such as ‘Locus’ are the philosophies of the body, principles of movement that choreographers propose for dancers and in turn produce the specific dancing bodies in performance works.

This anecdote I offer as a way to describe the research conversation of ‘meta: discourses from dancers inside action machines’. The voice on this page is similar to the one that is woven throughout the exegetical document. The exegesis will focus on the concept of “ex-quiry” and the history of studio-based processes where dancers are engaging with external frameworks. The exegesis will introduce my concept of “ex-quiry” by tracing a history of the idea of external frameworks from Robert Dunn’s Composition Class to current dance practice. I will discuss the work of several choreographers whose work strongly proposes different models of studio-based process from the perspective of potential prototypes for “action machines” (external frameworks) that create the conditions for “ex-quiry” and elicit movement responses from dancers. And, I will speak to the Physical Thinking Prototypes I have constructed in my own studio-based processes and the affects they have had upon my body, the ways in which they direct my attention and how they have constructed new bodies for me in dance. These include engagement with several forms of technology (e.g. the software package ‘Poser’ through which I created a series of physically impossible movement sequences as an experiment into how this form of ‘ex-quiry’ could impact my movement practice). However, technology here serves not as a primary site of investigation, but more as a means of unpacking a process of development and exploration from the point of view of a performer.
INTRODUCTION

*The “tradition of the new” demands that every dancer be a potential choreographer.*

(Banes 1987: 5)

The dancer’s perspective is crucial to developing the discourse surrounding studio-based dance practice and processes, as it is within the act or context of dancing that the experience of dance resides. From the perspective of dancing I am seeking to examine and articulate how different forms of external frameworks and their application in studio-based dance settings construct opportunities to challenge how dancer’s bodies can be developed or altered through their engagement with specific practices and processes. Hence, *meta: discourses from dancers inside action machines*, seeks to examine studio-based processes in dance from a dancer’s perspective. More specifically, I aim to examine the application of external frameworks such as equipment, scores, task-based processes, exercises, and digital technologies within studio-based dance practices and the effect these practices, protocols and strategies have on dancers’ bodies.

The work of Jennifer Roche, Michael Huxley, and Bud Blumenthal are some examples of the discourse surrounding the work of dancers that is beginning to form, as the role of dancers within contemporary choreographic practices comes under increasing focus. (Roche 2015, Huxley 2015, Blumenthal 2012) Given the complexity of dance as an ecosystem of thought, movement and practice, and given the wide range of individual practices, both dancer-ly and choreographic, that sit within this field, the role and practice of the dancer requires extensive examination. Examination of dancers’ work should take into account numerous perspectives and methodological viewpoints if we are to generate a deep understanding and articulation of how the processes of the dancer function within contemporary dance practice.

For this research project, *meta*, I examine these practices from my own perspective as dancer-choreographer. My approach will be to incorporate and triangulate my own perspectives through eliciting dialogue on studio-based processes through the lenses of other choreographers, dancers, and other researchers, collaborators, or critics. In doing so, I aim to further not simply an articulation of a specific approach to dance practice, but to move towards integrating the embodied perspective of the dancer within the larger realms of dance and choreographic scholarship. This is not to say, however, that the contribution of the dancer is ‘only’ embodied. It is precisely the integration of body/mind, embodied/intellectual practice that this thesis seeks to highlight. That this must be done (or at least commenced) from the vantage-point of a single practitioner is one of the great dilemmas of contemporary dance research. Embedded within *meta* is a perspective of the dancer as collaborator or co-creator, contributor to the studio-based practice, choreographic project and their own construction of their body through engagement in practice. However, while *meta* emphasises the perspective of the dancer as collaborator the nature of the research project necessitated the work of the sole dancer-choreographer. The constraints of a practice-led research project at doctorate level placed restrictions upon the ability to invite other dancers into the research due to time, space and funding. Be that at is it
may, the sole practitioner, be that dancer and/or choreographer is of value, and the insights of the sole artist must be made available, in some way, to the many.

Throughout my research I have developed a series of different registers. My research takes place primarily in studio-based practice and the insights arising are dispersed across performance, blogging, journal writing, edited video, website, sound scores, and here within the written exegesis. Through, between and across all platforms emerges a constellation of ideas and a grappling with the best platform for their articulation. My project is driven by the practitioner and seeks to contribute a voice rarely used in academia. As a dancer-choreographer with my focus on studio-based process I seek to speak from this position and draw from but not labour on the continual referral to existing scholarship. These are not necessarily the domain of the dancer-choreographer or emergent from studio-based practice. Existing scholarship supports but does not dictate or override studio-based practice and the knowledge to be found within and articulated in the terms of the practitioner. Such an approach aims to extend the audience of the research—to include the dance community, industry and others potentially interested from more diverse fields. It seeks to provide multiple points of entry and differing forms of discussion and articulation for accessibility to the research and ideas within.

Dancers are integral to choreographic practice and performance. However, much if not most dance research literature is presented from the perspective of the choreographer, and/or focuses on developing cultural and artistic readings of the performance works themselves, rather than specifically addressing the studio-based processes from which these works arise. The focus on studying performance works has begun to change in recent years as a result of a new interest in dance documentation in which the choreographer’s processes are considered integral to the overall practice, and typically represented along with existing works. Key examples include the Forsythe Company’s Motion Bank and Anne Teresa de Keersmaeker’s A Choreographer’s Score. (Motion Bank and de Keersmaeker 2012)

However, while this new approach articulates a clear integration and conceptual continuity between choreographic process and outcome, it has, to date, largely been undertaken from the perspective of the choreographer. It therefore does not focus on or articulate the experience of dancers engaged in the choreographic practice—in the doing, the physical and intellectual labour of working inside frameworks. Jennifer Roche suggests that the perspective of the dancer reveals “…a side to dance creation that is rarely presented in academic writing and offers another voice beyond that of the choreographer, dance critic or academic and points to a new means of knowledge production in dance.” (Roche 2015: viii) In contemporary dance settings dancers are often actively entwined within the choreographic practice. They are entangled within frameworks and tasks that choreographers propose to aid in the development of movement for performance—the movement invention. While the choreographer constructs or creates platforms within which experimentation/invention can take place, it is most often the dancer who undertakes the experiment, engaging immediately with and in relation to the environment, concept, framework, score, text, image or other (literal or metaphoric). And, it is within the in-between space,
between their body and an external framework, that the experience which incites an action response resides. This external framework has inspired the development of the concept of “ex-quiry” to frame the work the dancer does in relation to this external framework.

What dance is or might be is complex to describe as its ecology is perpetually shifting. Dance is not one thing or another but instead encompasses a diverse terrain of practices and aesthetics. Within my own practice as a dancer-choreographer (necessarily entangled), I can locate myself within a part of contemporary dance that focuses upon training, practices of the body, and what might be physically possible for human bodies. I am committed to exploring the potential of movement with an eye on what is physically possible through researching various movement techniques, as well as developing systems to enable the body of dancers to arrive at new or novel solutions to physical problems. In saying this, I do not mean to suggest a focus on training and skill acquisition per se. Rather, for me, it is about how studio-based processes and systems might enable the body of dancers to arrive at new or novel solutions to physical problems. That there might also be, in the process, the possibility or even necessity of “up-skilling” in terms of technique it is not the primary focus or intention. The process of “up-skilling” as I experience it in practice, is almost a by-product of dancing. Dancing in new systems, new external frameworks, offers a new experience. Through the exchange I have with a system I develop new capabilities. Sometimes these capabilities represent small advances or additions to my knowledge and physical capacity, and at other times the changes seem monumental. The experience of the movement, of the potential that emerges from between my body and an external framework, is incredibly rich and exciting for me, and I engineer studio-based processes and performances to optimise and enhance this effect. This is the background I bring to my research into “ex-quiry”, as shared through the META installation and performance, 26-27 November 2015.

The concept of ‘ex-quiry’ provides a platform from which I can examine and articulate the experience of a dancer, in this instance myself as artist-researcher. I consider META to be both a performance work and a methodology. META is both a process for exploring and developing the concept of ‘ex-quiry,’ and an example or enactment of ‘ex-quiry’. That it is both arises from a practice-based methodology in which studio work is primary to both artistic and conceptual thinking, and from the assumption that these are, in fact, inevitably intertwined. As I attempt to unfurl the meta-narratives of both my own experiences of studio-based practices I speak primarily from the first person. Hence my investigation into and through ‘ex-quiry’ is necessarily inflected with my own physical and artistic histories, capabilities and approaches, and for me, ‘ex-quiry’ is inevitably tied up with the physical and with exploring what physical boundaries might be.

However, ‘ex-quiry’ also proposes a broader hypothesis—that one of the things that distinguishes contemporary dance practices from each other and from other kinds of practices are the methods choreographers apply to directing the dancers’ attention. And, how the process of directing attention produces specific thinking-bodies-in-action for each choreographer and possibly for each new choreographic work. The
strategies deployed by choreographers direct their dancers’ attention, and set constraints that function as task-based processes for dancers to create movement responses for. It is as if to labour on a ‘physical puzzle’ (a term I draw from Carrie Noland’s discussion of Merce Cunningham in her paper Coping and Choreography 2009), that creates the opportunity for dancers to react. The process of reacting to a task or set of constraints generates a friction within which a dancer can construct strategies to meet and exchange with the choreographer’s intention. Through these processes, dancers’ individual responses are placed within an environment, a context that shares and co-creates through the many potential collaborators within a shared field—the studio.

Within these environments, dancers—that is to say dancers’ bodies and their embodied minds—work collaboratively within frameworks set by the choreographer. Hence, the dancers’ choices and individual particularities co-create the choreography. Roche suggests that dancers have a “…moving identity, which is both an individual way of moving and a process of incorporating different movement experiences in training and in professional practice.” (Roche 2015: vii) The idea of the “moving identity” is such that it will slip, spill, and grow throughout their career as the dancer accumulates experiences. Contemporary dancers for the most part will sustain a practice working with choreographers “...in many creatively distinct choreographic processes” and be “…led by various choreographers, who each utilize an individual approach to movement”. (Roche 2015: vii) These form a set of environmental and individual constraints that affect the choreography, and operate in tandem with choreographic structures and with the external frameworks of the studio-based processes that underpin the choreography. These environmental and individual constraints affect and construct the dancer’s body in ways specific to that choreography. For Roche, “these processes alter the dancer’s moving identity through the accumulation of new patterns of embodiment that remain incorporated as choreographic traces.” (Roche 2015: vii) As I will discuss in greater depth below, environments such as these create a series of experiences as ‘samples’ that a dancer might chose to incorporate or leave behind as they constitute themselves in their daily practice of dancing.

Most commonly in dance we speak of choreographies in relation to the choreographer. However, given many contemporary and post modern dance choreographies at their core rely on studio-based processes that elicit movement responses by the dancers, we might perhaps also speak of dance in terms of the kinds of dance responses and choices dancers make. These responses form the physical foundations for choreographers when choreographing their dances/choreographies. This is not to negate the significance of the conceptual frameworks that work at eliciting the responses from dancers, nor is it to negate the work of the choreographer to direct, shape, and craft the dance from out of the myriad of material generated by dancers on a daily basis. It is, however, to draw the attention to the work of the dancer, their intelligence, and their experience of working inside the external frameworks of choreographers. This shift in studio-based practice, and the role of the dancer as collaborator “…has required that dancers adopt sophisticated strategies that can differ between dance projects and this radically
shifts the more traditional concepts of the choreographer as the embodied mind of the work and the dancer as the canvas or choreographic tool." (Roche 2015: viii)

The movement generated by dancers in studio-based processes is not arbitrary. Dancers generate movement specific to the context within which they are working at any given time—to external frameworks and to what is often a shared training or set of aesthetic concerns governing the body in motion. Dancers are therefore “…live agents in dance-making and performance”. (Roche 2015: ix) In the context of dance making where dancers are engaged in the kinds of studio-based processes with external frameworks as I have described above, it is necessary to consider the perspective, experience and insights of dancers. The “…nuances that are specific to dance and the complexities of the relationship between the dancer and choreographer, the dancer and the choreographic score, and the dancer within the performance terrain” can be greatly illuminated if, as Roche suggests, “…attention is given to individual dancers’ experiences of embodying choreography.” (Roche 2015: ix)

For meta, I have sought out and constructed a range of contexts within which to create work as a dancer to test the nature and limits of ‘ex-quiry’ as a process. In some studies, I worked as a soloist simultaneously creating and dancing the work. In other instances, I worked as a dancer for other artists in situations where my creative input as a dancer-choreographer was critical to the project outcomes, and then developed new studio-based processes that were essentially ‘spawned’ in relation and reaction to the original projects. I have documented the experiences I gained as dancer and dancer-choreographer within a series of ‘Physical Thinking Prototypes’ which demonstrate and enact the range of studio-based practices and processes I have constructed as external frameworks for my work.

As a dancer-choreographer for others I specifically sought out opportunities within which digital technologies intersect with live performance. Digital technologies have afforded me new paradigms for dance making. As a dancer my research has focussed upon how particular applications of technology within studio-based practice might affect, alter or enhance dancing and ways of thinking about, through and in action.¹ For meta, I refer to my collaboration with John McCormick. (McCormick 2014) John’s invitation to teach his Artificially Intelligent Performance Agent to dance and perform duets in specifically designed scenarios informed by traditional studio-based creative dance practices informs one of my Physical Thinking Prototypes, meta. Through working within an external framework structured as interaction with an AI Agent (an interaction and exchange process made possible via streaming real-time motion capture data and based on the agent’s ‘learning’ from sample data within a motion capture environment), I developed a new solo studio-based process to reflect and extend the experience and “body” developed by the Agent. (McCormick et al. 2014)

¹ ‘Action’ is referred to throughout my thesis. While there is a history of the use of ‘action’ as a term in dance for me ‘action’ quite simply is a way to demonstrate any form of movement (danced or otherwise) response as arising from an exchange between myself as dancer-choreographer and an external framework.
The short solo performance, also called meta, is a response to the collaboration with John and his AI Agent. The performance meta, punctuates my experience as a dancer collaborating with an AI Agent in scenarios designed in collaboration with John and provides a performed document of the experience, re-examined and re-imagined as an independent performance and practice.

I have also pursued other kinds of experiments to examine techniques of the body (dance, circus, sports and improvisation) as ‘collaborators’. In this situation, in which I am working as a solo dancer-choreographer, the collaboration becomes between myself and a set of physical practices, with a view to discovering what the limits or extremes of physical performance might be. I have done so in a quest to test the potentiality of physical performance, and the possibilities for motion. I have also sought to test how the use of equipment such as aerial silks and tumbling mats might inform movement and conceptual ideas for performance. The premise for each solo work was a formulation or situation that would enable me to test and challenge specific physical problems for the body in motion.

The concept of physical problems forms a key starting point for my work. I understand this term through the writing of Carrie Noland. Discussing the work of Merce Cunningham, Noland describes Cunningham’s choreography as “particularly suited to an approach that seeks to discover the ways human bodies produce themselves (how they refine their capacities and thus assume new shapes) in relation to technological environments and situated demands.” (Noland 2009) One might also look to Susan Foster’s research into the necessarily different bodies produced through the studio-based processes, trainings, and choreographic works of Duncan, Cunningham, Graham, Ballet, and Contact Improvisation. Foster describes the bodies produced by the choreographer’s practice and techniques they have established to render dancers’ bodies so deeply inscribed with the established tradition that they are almost incapable of working within another tradition. (Foster 1992) On the other hand, Foster’s description of the ‘body for hire’ constructs itself via an ongoing training practice in multiple techniques, thus cultivating

a new kind of body, competent at many styles...It does not display its skills as a collage of discrete styles but, rather, homogenizes all styles and vocabularies beneath a sleek, impenetrable surface. Uncommitted to any specific aesthetic vision, it is a body for hire: it trains in order to make a living at dancing. (Foster 1992: 493-494)

While not necessarily a ‘body for hire’ in Foster’s terms, I would suggest that this kind of practice does lend itself to the ‘body for hire’ concept. Here, the context is a potentially infinite pursuit, via diverse training and (I would add) studio-based processes towards physical problem solving, ‘ex-quiry’. However, I would suggest that ‘ex-quiry’ is fundamentally about an accumulation of experiences in the body, rather than necessarily a means of subsuming them beneath Foster’s “sleek impenetrable surface”. A process of ‘ex-quiry’ as I frame it in this project aims at experimentation rather than employment per se. It arises from a curiosity in the body, and about being in the world of movement and ideas. It is about the richness of experience and the expansiveness of potential that might be made possible through gathering
experiences. And, it is about an individuated growth continually constructed and deconstructed in an ongoing process of articulating/constructing a ‘self in motion’.

In ‘Dancing Bodies’, Foster presents the dancer’s relationship to her own body as encompassing “the entwinement of mastery and disintegration” or between stability (fleetingly) and instability. (Kozel 2007: 255) For the cultivation of a dancing body Foster states that a dancer will spend “anywhere from two to six hours per day, six to seven days per week for eight to ten years”. (Foster 1992: 482) There is a certain slipperiness throughout the dancer’s travail whereby

the body seems constantly to elude one’s efforts to direct it. The dancer pursues a certain technique for reforming the body, and the body seems to conform to the instructions given. Yet suddenly, inexplicably, it diverges from expectations, reveals new dimensions and mutely declares its unwillingness or inability to execute commands. Brief moments of “mastery of the body” or of “feeling at one with the body” occur, producing a kind of ecstasy that motivates the dancer to continue. Clear sensations of improvement or progress—the result of a momentary matching of one’s knowledge and awareness of the body with a developing physical capacity—also provide encouragement. The prevailing experience, however, is one of loss, of failing to regulate a miragelike substance. Dancers constantly apprehend the discrepancy between what they want to do and what they can do. Even after attaining official membership into the profession, one never has confidence in the body’s reliability. The struggle continues to develop and maintain the body in response to new choreographic projects and the devastating evidence of aging. (Foster 1992: 482)

In consideration of constructing dancing bodies in the digital age and with reference to the independent dancer, the entanglement of mastery and disintegration is particularly pronounced. Here the dancer is enmeshed within an ecology where they’re continuously and sometimes rapidly changing perspectives of the body.

The beauty for me is in the imperfection, of the slipperiness in this case of “mastery” that creates a gap between stability and instability of an authored perspective of the body. It in part creates the in-between required for processes of ‘ex-quiry’ whereby the construction of the dancing body remains fluid, influx and in a perpetual state of exchange between the dancer and the external frameworks that seek to elicit movement responses and direct the dancer in space and time. The body as a site of becoming and unbecoming at once. The potential of the body always active, always in motion—traveling through, between and across multiple planes.

Since this investigation is focussed on dance studio practice from the perspective of the dancer, I chose to contain my research to my own practice as dancer-choreographer. I have therefore focused on approaches that can articulate what ‘ex-quiry’ might be for me artistically. My interest in what’s possible for the human body in motion has come about through collaborations with artists from different fields, and, in more recent years, through the potential I see for the collaboration between technology and the body. The physical problems, puzzles for the body to solve I have explored are therefore formulated in this light. There are many potential studio-based processes with external frameworks that propose different perspectives of the body, relationships to moving, thinking and relating to dance, other bodies, environments
and to ideas. Of necessity, a ‘single-artist’ study can only form a few of many articulations possible of the idea ‘ex-quiry’. However, examined within a context formed by internationally recognised choreographers whose specific studio-based practices and processes employ external frameworks to create systems for experimentation with movement possibilities, these experiments enable me to consider how ‘ex-quiry’ as a concept might have value and validity beyond my own work, albeit in necessarily differing ways.

“EX-QUIRY”

As a dancer and dancer-choreographer my experience has been across many different forms of dance training—ballet, jazz, tap, and contemporary. Subsequently, moving towards other physical practices such as aerial arts, tumbling, adagio, improvisation and physical theatre, I made the choice to follow a path of collaboration. Collaborations in my dance practice take place between practices of the body, artists, ideas, systems, equipment and technology. The concept of ‘ex-quiry’ began as I attempted to find a connection between the disparate practices I was practicing independently, in relation to different collaborative projects, and choreographers I was researching and the practices I was training in. I was asking the question of what is the connection between Gaga, Pop Action, and duets with an AI agent? Is there anything at all? I arrived at the idea that they all have systems, external frameworks of some description that function to propose, elicit, suggest, inspire, incite, imagine or examine movement. Each is a puzzle to be played with and continually re-entered into dialogue with for it is never fully solved.

I propose ‘ex-quiry’ as a process within which dance examines that which is extrinsic to the body, self and practice. Although we may more readily describe contemporary dance practice as a process of ‘inquiry’ within the body, this idea of ‘ex-quiry’, as I conceive of it, runs parallel to inquiry. In early modern dance self-expression creates a process of subjectivation. Another perspective of modern dance and moving towards post modern dance is the objectivation in dance. This process of objectivation of dance, like in case of Merce Cunningham, “presupposes another relationship between movement, the body, and the subject in the expressive act: dancing is foregrounded, or even in the most rigorous claims, reduced to a physical articulation of the movement, whose meaning lies, tautologically, in itself.” (Cvejic 2015: 19) Systems, scores and equipment function as potential frameworks and enables movement to be “created as an object in itself”. (Cvejic 2015: 19) Hence, “the function of the body shifts from being an autonomous subject to being an instrument of movement, a “doer” of the action or task of movement.” (Cvejic 2015: 19) ‘Ex-quiry’ does not sit on either end of the spectrum (subject/object) but instead allows for a continuous crossing between the two. Self-expression is not necessarily sought or desired however it may be in the process of attending to the ‘doing’ that the individual expression of the dancer manifests in its’ creation of movement, decisions, and choices made.

‘Ex-quiry’ provides frameworks for processes and practices, both literal and metaphoric that exist outside the body of the dancer. By this I mean that while there
is an embodied practice of inquiry at play, there is also a practice within which the dancer seeks to investigate beyond the immediacy of their self. The process of investigating beyond one’s self in dance practice can contain many iterative oscillating layers of feedback loops. Within, the paper ‘Dancing in Suits’, I described the process of working as a dancer in motion capture environments at Deakin Motion.lab. (Hutchison and Vincs 2013) In my experience, I have found that the markers on my suit become like collaborators. I am aware of their presence in specific locations on my body. I think about the relationships between my body, movement, the markers, the cameras (aware that sometimes, with, for example, floor-based movement, I may occlude a marker or several), the team of digital artists—animators and motion capture technicians, the director or choreographer and any other potential collaborators or audience within the space. I attend to specific tasks that may have been set by the choreographer, to my responses to the visualisations projected on the screen, or to specific concepts that a digital artist or coder was interested in in their construction of an interactive system. And, I also listen not only with my ears to the “oohs” and “ahs” that often issue from those in the space, but also with eyes to the screen, and my body to receiving feedback that I can create further riffs from. These become loops—loops of feedback that create opportunities for me to make choices as a dancer, choices for response, action. In the simplest form this is my task that underscores all other possible tasks either directed to undertake, or individually developed from out of the environment within which I am located for that time.

The proposition of ‘ex-quiry’ led me to a series of questions:

What models may exist for dancers to experiment physically in the studio on their own? What processes of ‘ex-quiry’ already exist? How are choreographers using this idea of ‘ex-quiry’ to provide task-based choreographic processes for their dancers to undertake in the development of new work? What does this mean for training in dance? Is technique still important? Are concepts such as ‘ex-quiry’ a way to stimulate innovation in movement aesthetics, problem solving, critical thinking, and producing more highly nuanced bodies? How do external frameworks direct the attention of the dancer? Does this create an opportunity to construct their body in a new way? What affect does this have on the dancer? And, what is their relationship to the studio-based processes with which they engage?

Working inside Trisha Brown’s seminal cube structure for the work Locus (1975), Mona Sulzman writes: “One of its properties, in the context of the piece, is the view it affords me, from within, of the vast, expanded structure of the entire dance. All around me plain and obstinate order overflows with boundless and startling possibilities.” (Sulzman 1978: 117 – 130) Of significance in Sulzman’s perspective is that the constraints of the structures operating throughout the entire dance draw out possibilities as opposed to limitations. Her insight assists understanding the physical and conceptual conditions of this particular studio-based (and performance score) process and the affect it may have on dancers. This insight also enhances our understanding of the role of the dancer, which is sometimes implied rather than explicitly stated, and raises the question; to what extent are the dancers’ studio-based processes formed by but also independent of the choreographic process, and
what happens when they are no longer tied to the performance of the
choreographies in performance?

‘EX-QUIRY’ IN POST MODERN AND CURRENT DANCE PRACTICES

To begin to answer these questions, it is first necessary to examine how the
process/concept I term ‘ex-quiry’ can be mapped in relation to current and historical
dance practices. The concept of contemporary dance practice as a process of both
inquiry and ‘ex-quiry’ can be readily applied to almost any contemporary dancer-
choreographer. The nature of the individual project proposed by Laurence Louppe is
such that contemporary artists are searching beyond their body and beyond what
might be understood as the traditional confines of codified dance traditions and
techniques. (Louppe 2010) However, both codified traditions and techniques may
inform the body of the individual as they undertake further experimentation. In
Louppe’s discussion of contemporary dance as a “project” she builds a conceptual
map from modern dance through to contemporary dance. Louppe suggests that “…in
contemporary dance there is only one true dance: the dance of each individual.”
(Louppe 2010: 23) Each individual dancer-choreographer has immediately at hand
their own individual set of genetics, and an individual history as a mover and thinker
from all manner of environmental experiences. These individual factors meet with
external frameworks, concepts, ideas, or structures through the construction of
experiments that enable, over time, an individual to generate their “one true dance”.
For each individual their dance is borne from their actions rather than from a simple
rearrangement or recombination of materials, from a process of engagement with
and action within, through or against frameworks—of creating cuts and making
choices that produce action, or action that creates the possibility for choice. It is not
linear.

That the body might find its own poetics in its texture, its flows, its supports has
to do with the very invention of contemporary dance. To invent a language, in
fact, is not to manipulate a pre-existing material but to give birth to this very
material, while justifying artistically its genesis and by implicating the subject in
the undertaking as producer and interpreter of her/his own matter. (Louppe
2010: 32)

While ideas external to the body, and external to dance are sought as ‘collaborators’
for contemporary practice, technical dance training systems (for instance, ballet) also
provide important extrinsic foundations and frameworks from which dancers and
choreographers can move beyond traditions through processes of ‘ex-quiry’. In
regards to “contemporary techniques,” Louppe suggests “no matter how scientific, no
matter how long it takes to acquire them, are before anything else the instruments of
a knowledge leading the dancer to this singularity.” (Louppe 2010: 23) Often this
process is repeated time and again in search of more experience, more knowledge. Each
individual project undertaken by dancers and choreographers readily positions
one’s body, self and practice in relation to the “other” through their own volition. For
every artist these are personal choices often arising from within practice or from
experiences of living in the world. The cyclical processes of Trisha Brown, for example,
demonstrate an ongoing investigation into the potential for the human body in
motion, in relation to ideas both within and outside of her body and the field of dance. (Teicher 2002)

Banes notes that in the tradition of modern dance where the history is rapidly cyclical: revolution and institution; revolution and institution. The choices for each generation have been either to enter the new academy (but, inevitably, to dilute and trivialize it in doing so), or to create a new establishment. In this system, the importance of the choreographer over the dancer is obvious. The "tradition of the new" demands that every dancer be a potential choreographer. (Banes 1987: 5)

While modern dance “was predicated so heavily on personal, often intimate, formats, on subjective content, and on individual quests for movement styles that would express not only the physicality of the choreographer, but also his or her thematic concerns and theories of movement,” contemporary dance is often more collaborative and therefore distributed in terms of the choreographic auteur. (Banes 1987: 5) From the contemporary perspective, Louppe suggests that; “Even if certain avant-garde practices (including 'performance art') have joined dance in this pure ‘co-substance’ of the subject with her/his work, contemporary dance has this in particular: that it secretes its matter and the qualities of this matter from the ‘expenditure’ that gives it birth. Here there is no precedence, no law already in place.” (Louppe 2010: 23 – 24) While the moderns constructed a terrain where “every slight shift in technique or theory from teacher to student came to mean not further refinement but further revolt,” (Banes 1987: 5) the contemporary formulation, at least according to Louppe, is that there is no prior law or norm to resist or subvert, but only the productive energy and conception of the individual artist/body.

As a result, 'ex-quiry' can be read differently in relation to these different conceptions of dance creation. While 'ex-quiry' in the context of the ‘moderns’ as Banes articulates it would consider external frameworks as an aid to differentiation as a form of ‘rebellion’ from existing styles—a mechanism for ‘making strange’ familiar dance forms, in a ‘contemporary’ context of the kind Louppe defines, ‘ex-quiry’ would occupy more of a hybrid, almost ‘prosthetic,’ role with a view to extending the potential of the individual’s experiment without necessarily needing the result to be ‘strange.’ Hence, ‘ex-quiry’ is necessarily situational and contextual in nature. It can therefore only be enacted, understood and investigated in relation to specific practices taking place within specific historical, artistic and aesthetic contexts.

THE CONCEPT OF THE ACTION MACHINE

In the context of contemporary dance practice, it is common for choreographers to work with improvisation as a method for generating movement for performance. Through a series, or many series, of improvised experiments dancers are invited to experiment and explore the choreographer’s ideas. Their responses are then elaborated to develop the choreography for performance. The framing of the choreographer’s ideas may come in the form of a series of directions, tasks, scores, images, equipment or a software program. I propose that the tasks, scores, images, software and equipment (among other methods deployed by choreographers)
function as external frameworks or ‘action machines’ that give specific form to the process of ‘ex-quiry’ by eliciting specific movement responses from a specific set of dancers. The dancers act by making decisions through the process of interacting with the action machine constructed and offered by the choreographer.

I have borrowed the term ‘Action Machines’ from Elizabeth Streb. Where Streb describes the equipment or apparatus she designs or enlists such as bungee harnesses and revolving floors as ‘Action Machines’, I understand action machines as external frameworks for the practice and studio-based processes of both choreographers and dancers. The frameworks create a cut or break in the traditions (which may be form or choreographer specific) of dance from both technical and aesthetic perspectives by generating opportunities for extending, experimenting, and researching specific physical, conceptual and choreographic problems within, through and about movement. An action machine’s function is usually to elicit potentially new or different movement. Therefore, they can come in many forms, tailored to the specific kinds of movement interests within a specific practice. While for Streb an Action Machine is most commonly a piece of hardware/equipment, for other choreographers it may be a written score, task, provocation, image, video, or an exercise. In other words, action machines can be literal and metaphoric forms of software and hardware for dancers. Each functions as a form of bespoke ‘technology’ in the sense of enabling action otherwise impossible. In this way, technology might be considered to be a systematic application of ideas for practical purposes including experimentation, exploration and generation in relation to another entity, rather than a specific ‘apparatus’, although of course, the ideas may warrant apparatus of varying kinds. The relationship between the human body of the dancer and an action machine could be an imagined cube, a poem, a bungee harness or an artificially intelligent choreographic agent. All offer choreographers and their dancers the opportunity to research the potential for movement beyond their own sense of a known movement vocabulary.

For choreographers, action machines provide a method through which to articulate and share their ideas with their collaborators, the dancers. And, for dancers, action machines offer an interactive system to be in dialogue with. This interactive system, the action machine, may contain ideas and images of the choreographer or indeed their own but in the process of engaging with the action machine they create an interval as the site of their investigation into action potential. This interval between the dancer and the external framework I describe as the site of ‘ex-quiry’, the site of exchange between the dancer and the framework where their enquiry takes places. While the dancer does undergo a process of inquiry within their body, they are directed via the dialogue with the framework outwards, towards the interval between their self and something other. Their attention therefore is not inwardly focused but instead is relational.

Dana Caspersen encapsulates the experience of the dancer when describing her experience as a dancer for William Forsythe. Caspersen writes:

Taking in information within the kinesphere—the space that the body’s movement occupies—involves sensing the body where it cannot be seen...This
ability of the body to create an internal image of itself also allows for the possibility that the body can create an image or sense of itself where it does not exist, or for it to imagine itself orienting along lines, planes, or volumes in ways that are not actually possible...The proprioceptive field seems to expand to include a space that my body does not actually occupy. This ability to imagine multiple versions of the self, a proliferating, projective equation that moves out from where the body is to where the body might be, creates a situation where space seems to be inhabited by a complex, fluid matrix of potential motion and form, of which the body is part. (Caspersen 2011: 96)

While the experience of dancers across all traditions of studio-based processes leading towards choreographic performance works is under documented, my focus is on the experience of dancers working within action machines. On those dancers who are part of studio-based processes where their participation is as dancer-choreographers—generating movement through their engagement with a choreographer’s external framework. From the beginning some of the questions guiding my research have been: What is the role of the dancer? Within studio-based processes where they are working with choreographers in external frameworks what is their experience? How do they define their practice? Within the process what are they attending to, what is their attentional score? What are the methods and strategies they use while working within the framework? Do they have a sense that their body and the way they think about moving, and the type of movement they create is altered by the framework they are working within in the studio? Do previous experiences in other frameworks or techniques of the body such as ballet inform the ways in which they engage and work within the current framework in the studio-based process of the choreographer?

SCAFFOLDING

One might like to think of action machines as propositions affording invention and reconceptions of what dance might be and what might be possible for human bodies in motion. In turn, the studio-based practices and processes that artists employ for themselves and their dancers to work within, may also reconfigure, construct and re-imagine the dancers’ bodies—physically, creatively, cognitively and that this in turn alters their movement possibilities, available and produced. As such, the following discussion explores the concept of ‘ex-quiry’ in a range of contemporary and post modern dance practices over the last century, in order to demonstrate the extent to which this idea has permeated dance practices that may have little in common aesthetically or artistically.

Within studio-based dance processes (I suggest) there has been an extremely diverse range of ‘ex-quiry’ undertaken by dancers in choreographer’s studio-based processes with external frameworks. I offer a small cross-section below in the chapter Action Machines, by referring to the practices of: Merce Cunningham, Trisha Brown, Elizabeth Streb, and William Forsythe. This cross-section of artists from post-modern and contemporary dance includes external frameworks in the form of scores, equipment, ideas from fields outside of dance, and technology. For each individual
there may be multiple forms of external frameworks and for what I suggest are processes of ‘ex-quiry’ taking place throughout their career.

I present this discussion in an order that is deliberately not chronological, to avoid creating the impression that the nature of ‘ex-quiry’ has evolved from era to era, or choreographer to choreographer. I want to explore the idea that ‘ex-quiry’ is not so much a linear stylistic progression, but something more disjunctive—a potential disjuncture that can introduce (or that artists can deliberately introduce) to produce ruptures in style and in practice. I consider this in relation to hip-hop culture2 where the “cut”, the ruptures, the groove between styles creates the opportunity for a new identity to emerge. However, the processes of ‘ex-quiry’ I describe are also inescapably historical, and so it is equally critical to consider the context in which these specific examples arose.

Within the context of contemporary dance the Judson Dance Theatre and in particular the composition workshops of Robert Dunn provide a seminal conceptual foundation for contemporary action machines. In his book, *Entangled*, Chris Salter, states the artists of the Judson Dance Theatre were keenly interested in the manipulation, intervention, and extension of the dancing body through all manner procedures, game models, or any other kind of “movement not pre-selected for its characteristics but resulting from certain decisions, goals, plans, schemes, rules, concepts, or problems” (Kirby 1975, 3). Rigorous techniques derived from mathematics or inspired by science could thus yield unexpected possibilities that would not necessarily be under the direct control of a single individual but rather subjected to systemic evolution and control. (Salter 2010: 241)

Studio-based processes that position dancers in relation to an external system create the opportunity for an interstitial space, ‘ex-quiry’, to emerge as a field of potential for action. The potential for action that systems may bring about will be discussed within the context of dance and also later within the context of motor learning since the mechanisms of ‘ex-quiry’ are inescapably physical. The creation of environments through the application of constraints often in the form of systems, rules, structures, and procedures all offer the potential for ruptures—breaks or cuts from within, through and between to chart new terrain. Sampling (like sampling in hip-hop) therefore affords disjuncture and the potential for the interstitial space, the slipstream, the groove within, between and through to discover or experiment with a new body and potential new aesthetic in dance.

---

2 Hip-hop culture emerged from my initial research (over the first 18 months) where my focus was on applying biomechanical analysis of movement and a sampling process to eliminate movement transitions (beginnings and endings) and assemble movement through a digital sampling method to create movement sequence that may be physically impossible. I sought to take movement from circus and dance traditions as starting point and digitally disrupt any sense of logic I may have had about sequential movements and problem solve the new proposition. What emerged from this was a perspective on sampling from hip-hop of the “cut” and this opened up my interest in the in-between spaces of dancing and led me towards ‘ex-quiry’.
Within the notion of sampling are ideas such as gathering a collection of fragments, specimens, assembling something from out of collected resources, and cutting and pasting experience into a new form. For me the very process of tasking in the studio can afford sampling. In order to task I bring with me a history and body of knowledge into the studio and engage with a specific task or other framework. Through, between and within the practice and process I generate samples of potential movement that can be assembled and/or create for myself a series of experiences and movement identities that might emerge at a later date and inform future studio-based practice. And, from within the studio-based practice ideas and writing that arises find their expression in the form of written text, sound files of text-to-speech made into soundscapes, edited video and layered together as image, text, film and sound on my website. In other words, the process of sampling in the studio might be viewed similarly to hip-hop where the breaks in culture and environment can and do create gaps from which a new assembly may emerge.

Goldberg writes in her chapter *Trisha Brown, U.S. Dance, and Visual Arts: Composing Structure* of the makings of the concept of the ‘task’ in studio-based dance practice and its future influence on artists of the Judson Church and beyond. “What Halprin called ‘task’ was similar to Cage’s confluence of art and daily life, bringing the dancer to a kinesthetic confrontation with the present instant.” (Goldberg 2002: 30) The practice of a task might be singular, daily, monthly or last for an extended period of time where it is repeatedly undertaken in a quest for greater discovery, understanding or experience over time. At Halprin’s workshop Trisha Brown “chose to sweep a broom across the deck”, as a daily task. Even though the origin of sweeping is pedestrian, “this became anything but mundane in inner experience. Sweeping and sweeping, she found herself at the far edges of imagination. She pushed the broom with just the right amount of momentum until it swept her up, as if levitating, ‘flying’ straight out, parallel to the deck.” (Goldberg 2002: 30)

Trisha Brown writes of her experience with Anna Halprin, as being her first encounter with “the mercurial surges of an intuitive process where physical proposals and responses were dished and dashed on a whiz-by playing field.” (Brown 2002: 289) The ‘playing field’ constructed the environment for physical experiments as proposed or as arising from Halprin’s introduction to “ordinary task as formal structure” which Trisha Brown interpreted as “sweeping the deck with a push broom for hours until I crossed over into levitation.” (Brown 2002: 289) While levitation may not have been part of the original task, it arose from the practice as a potential movement—directly affected by the practice over duration. This kind of task-based process has continued within many choreographers practice and has taken many forms. A task may have many different intentions, however the task in the case of the idea ‘ex-quiry’ serves as a means for discovery through experimentation of something that perhaps, without an external framework as a form of constraint, would not exist.

In the context of this project I am particularly interested in the ways in which tasks operate as external frameworks for dancers. For dancers to be engaged in a task they are engaged with something external to themselves and this engagement of necessity returns them to their embodiment, since the process is inevitably relational. That is to
Interchange in the context of action machines places the ‘user’, dancer, in relation to a system. Between the system and the dancer there is an ‘interval’ that operates as a field of potentiality for movement. In their role of eliciting movement, the action machines act as external frameworks for the dancer to experiment with potential movement. By working with an external framework the dancer now has a ‘cut’, an interval between themselves and the framework where their investigation of potential action may reside. I am drawing here on Erin Manning’s concept of movement as relational. Manning proposes that, “the interval creates the potential for movement that is expressed by at least two bodies.” (Manning 2009: 17) The action machine may be thought to be a form of ‘dynamical system’ (Bernstein 1967) in this context—it is not a constant but rather an entity in flux. Due to its nature as an entity the action machine also has the possibility for further mutations in relation to the interaction between the dancer and its form—structure, tasks, or rules for example. As such, the cut creates a space of pure potentiality always in motion.

The interval is duration expressed in movement. It is not something I create alone, or something I can re-create by myself. It exists in the between of movement. It accompanies my movement, yet is never passive. It activates the next incipient movement. The interval is the metastable quality through which the relation is felt. Many potential intensities populate it. It expresses itself as the shifting axis that connects us. (Manning 2009: 17)

By placing and maintaining attention within the interval between their self and the action machine, the dancer is able to sustain what might be described as an unconscious perpetual ‘becoming in motion’. (Manning 2009) They are attending always to the ‘now’, the present moment of movement. As Manning states the, “‘embodied cognition,’ the relation between perception in all its modes is one of reciprocal reach-and-return. This cross-genesis of action and perception opens onto thought. Every perception is already a thinking in action. Every act is a thought in germ.” (Manning 2009: 2)

The idea of dancers working within action machines can be discussed in relation to a series of choreographic ‘prototypes’ in which the design of the interaction is highly specific to the artistic concerns in play. Within each distinctive action machine, a series of constraints is developed into a framework that acts like a field of forces upon the body of the dancer.

An early example of ‘ex-quiry’ might be understood through the practice of Loie Fuller. In her practice-led study on Loie Fuller, Ann Cooper Albright describes her embodied investigation of reconstructing Fuller’s dance Le llys in her book ‘Traces of Light: Absence and Presence in the work of Loie Fuller’.

As a contemporary dancer, I had little experience of working with a costume that dictated so completely my movement options. Usually I would learn the
choreography to the dance and find a costume that allowed me to do that movement. Here, however, I was faced with the opposite: the challenge of finding the movements that worked with the costume. (Cooper Albright 2007: 186)

By, “exaggerating the size of the dancer’s skirt, and using brilliant lighting effects (which she invented and patented) to transform herself and her props and costumes into moving sculptures of light and colour, Fuller (who had been an actress, playwright, manager, and dancer) made radical changes in art dance.” (Banes 1987: 1 – 2) The size of the skirt, the sticks used to extend the physical body of the dancer to move the structure of the skirt and the development of the technology of coloured lighting afforded the potential for Fuller to construct a new dance. At first Cooper Albright states:

I was very frustrated, feeling mostly limitations to my movement as I repeatedly tripped on the fabric bunching up around my feet. Eventually, however, I became adept at handling the massive folds of fabric with my wands and began to enjoy the interplay of percussive initiation in my centre…and the subsequent play of loft and release as I guided the fabric down and then swooped it up again. Finding movements to keep the fabric suspended high above me was one of the most satisfying performing experiences…Certainly my experience of dancing with this costume was precisely one of having wings. (Cooper Albright 2007: 186 – 187)

Cooper Albright describes the somatic experience of having wings as being a deeper connection with my new wand-fabric appendages, for they became connected parts of my body. I began to feel these wings as joined not merely to my hands or even to my arms, but as connected low in my lumbar spine, their energy spreading out through my whole body into the reach space (all ten feet of it) above me. I also became increasingly aware of air as a movement concept. (Cooper Albright 2007: 187)

Fuller, “made the central focus of the performance the image—an object she created with fabrics, sticks, lights, and shadows.” And, the “movement that was required to create the desired visual effect was the correct movement.” (Banes 1987: 1 – 2) Through the design and employment of her costume Fuller drew “her audience away from attending to the usual trappings of the music hall (pretty, perky women dancers smiling at the audience and showing lots of leg).” (Cooper Albright 2007: 187 - 188) Fuller’s dances were not created in narrative form, instead, Fuller created dances where

...the text of the performance was the physical creation of an objective presence...When she danced with a group, she planned the dances so that the individual differences between the way the dancers moved would be preserved. She often used untrained dancers in her works, and she gave her performers a wide range of movement choices within the preset, imagistic frameworks she created. (Banes 1987: 1 – 2)

In this way, Fuller “introduced them to alternative ways of seeing bodies in motion.” (Cooper Albright 2007: 188)

The idea of the individual performer’s engagement with the task and their own way of physicalizing the ideas contained within the choreographer’s “imagistic frameworks”
(score) marks a distinction and departure from codified traditions of dance. The augmentation of the body through the use of fabrics, sticks (equipment), and coloured lighting (all technologies) as a means to detach emotion and personality of the performer (subject) from the performance, and to only perform the movement that was necessary to achieve a desired effect with the materials at hand, all stand as foundational examples of ‘ex-quiry’. The exchange between the dancer and their external framework/s, creates the objective presence that can be experienced by the audience. In other words, through the application of imagined frameworks, costuming as a form of equipment and technology alongside lighting design, the dancer’s attention is directed. They are engaged with a multilayered set of tasks, and within their performance of the tasks they work in a gap that creates the possibility for action.

Banes posits a conceptual (if not strictly historical) relationship between Fuller’s work and that of the post-moderns in generating an ‘objective’ mode of presence in performance and in appropriating elements of popular entertainment within high art contexts. There is also a similar mode of ‘cut’ between the trained and the untrained body, as Fuller and the post-moderns both embraced the idea that an untrained dancer could offer a different experience compared with a skilled and proficient dancer. External frameworks enable a kind of continuity or bridge between ‘trained’ and ‘untrained’ performer because a framework, or action machine, can be made available to any kind of performer, whether trained or not. While the outcomes will of course be different as a result of the performer’s experience and skill, or lack thereof, there is still an outcome and still an exploration, and hence potentially a choreographic process in both cases.

For artists such as William Forsythe and Wayne McGregor, who work with highly trained, elite dancers, external frameworks in fact complicate this picture. It is complicated because they provide both a means of utilizing and extending the technical training of ballet, which remains a shared background among choreographer and performers, through external frameworks, but also a means of “moving away from” this technique through the use of external frameworks. Since the external frameworks themselves do not necessarily require any prior balletic knowledge or training, their inherent ideas can be engaged with by any body. The action machine does not provide a recipe for highly specific movement replication, and therefore no prior specialized physical training is required for their use, other than a (presumably curious) body.

Despite the fact that most of the examples of the choreographers I have chosen work with highly trained, “technical” dancers, the action machines function as a suggestion, resource, guide, or provocateur to elicit movement responses through directing the dancer’s attention. Therefore, even though their most usual function is as a studio-based process for professional dancers, action machines can also be interpreted and interacted with by non-expert movers/dancers. Frameworks such as Forsythe’s Improvisation Technologies were borne of the choreographer’s physical practice, their embodied investigations, and seek to find ways to transmit this knowledge in other mediums. The construction and form of an action machine represents, to some
extent, the knowledge and thinking within the movement practice, and therefore becomes a potential means of distributing that knowledge beyond the context of the original artists’ practice. However, engagement by any body with an action machine cannot immediately produce the body or the choreography of the dancer—this is the confluence of practice and direction within the system given by the choreographer, engagement with other bodies and the dancer’s own experiences that all converge to reconstruct the dancing body in relation to the system.

Twentieth-century modern dance and the rise of the machine opened possibilities for new ways of engaging the body that were not necessarily limited to choreographic contexts. “If the machine could be used as an image metaphor of movement, it could also be seen as a system to organize, train, and structure the body.” (Salter 2010: 228) The development of “body movement-based training systems with obscure names like eurythmics, biomechanics, choreutics, eukinetics, and choreology” became key contributors to the developments of dance practice and aesthetics. (Salter 2010: 228) Labanotation developed by Rudolph Laban, in particular, can be viewed as an ongoing influence within the dance practice of contemporary dance artists. Laban’s research into movement led to the development of multiple systems within Labanotation. The systems include: the notation system kinetography (now known as Labanotation), choreutics, and eukinetics.

In the context of action machines, understanding Laban’s choreutics and eukinetics as frameworks within which to begin to design action machines might be useful. Choreutics, might provoke the design of obscure systems or environments that disrupt the verticality of the dancer and propose new relationships of geometries, architectures and spatial pathways of the body moving in space and time. And, eukinetics—the system for experimentation with the qualitative intensities of human movement in space and time, may also act as a reference point for movement research of choreographers.

A further reference point is the profound effect classical ballet has had on the ways in which dancers understand and interact with/within geometrical space. As ballet moved from an integrated part of a larger operatic performance to a distinct performance form, ballet movement became codified in relation to the spatial-geometric environment of the proscenium stage, as opposed to the spatial-geometric environment of the court. This break in ballet’s traditions required a technique suitable for the proscenium stage in which the action is always viewed from a single point of view—the ‘front’. The “classical ballet developed a vocabulary in which the dancing body was idiomatically embedded in three-dimensional extensive structures.” (Owen Clark and Ando 2014: 181) The codification of ballet in relation to the embedding of geometric principles defined by the context of the proscenium stage can be viewed as a form of action machine for dancers and choreographers to produce effects of the body in relation to the environment and aesthetic movement potential within the environment.

Geometry and architecture of the body are concepts that can be linked to Laban’s concept of the ’kinesphere’. “The kinesphere is the sphere around the body whose
periphery can be reached by easily extended limbs...We are able to outline the boundary of this imaginary sphere with our feet as well as with our hands. In this way any part of the kinesphere can be reached.” (Laban 1966: 10) The centre of the kinesphere is connected to a dancer’s centre of gravity and forms a three-dimensional structure “composed of height, breadth and depth”. (Laban 1966: 11) The concept of the kinesphere as proposed by Laban is extended within the work of choreographers such as William Forsythe (see *Improvisation Technologies*) and Trisha Brown (see *Locus*) in which the cube, among other platonic solid structures, can be used by dancers to visualize the space around them.

Frameworks, structures created/imagined, temporal and spatial or conceptual, might be understood as systems. While systems such as Laban’s are more associated with notation of dance and human movement more generally, their principles might be adopted and adapted in the construction of what Pil Hansen refers to as “dynamical systems”. Hansen suggests that, “performance-generating systems are best described as a semi-closed form of instant composition...a dramaturgy of pre-identified tasks, rules and sources within the boundaries of which performers interact on stage.” (Hansen and House 2015: 65) Systems constructed for studio-based dance practice and performance can function like the rules that govern games and sports to create organising principles for human playing pieces. They may be studio-based processes or indeed situated as systems in performance. In either case they inform the body of a dancer and contribute to the ways in which a dancer thinks, moves and interacts. Hansen and House describe the interactions of the performer as “neither pre-determined nor arbitrary”. Rather, “they self-organise around shifting components that attract certain kinds of behaviour over time. They also tend to involve cognitive challenges that initiate and accelerate a process of learning how to perceive differently while performing.” (Hansen and House 2015: 65)

Loïe Fuller’s work can be thought of in these terms. Her design and performance of dances with her patented “Garment for Dancers” (1894), physically extended “...the human body beyond its own established kinesphere through simple technical contraptions like poles and cloth”. (Salter 2010: 227) Where Fuller is concerned my focus is on her inventions with the “Garment for Dancers” as an early example of an action machine—a movement generating external framework for dancers. This is not however to dismiss her other inventions with technologies and the impact of her innovations on theatrical stage lighting. Fuller’s “Garment for Dancers”, an excessive dress of silk draped over her body and maneuvered by aluminium or bamboo poles held in her hands, enabled Fuller to construct her dances. The dances were generated via Fuller’s engagement with the framework (the silk dress and poles), extending her movement beyond her body and out into space. The dances Fuller was able to create with her silk dresses, constructed an “architectural body”, one that became an endlessly adaptive form—mutating morphologies in space and time. (Salter 2010: 226)

Merce Cunningham also created a break in the physical traditions of dance. Sally Banes notes that Cunningham
made the following claims: 1) any movement can be material for a dance; 2) any procedure can be a valid compositional method; 3) any part or parts of the body can be used (subject to nature’s limitations); 4) music, costume, décor, lighting, and dancing have their own separate logics and identities; 5) any dancer in the company might be a soloist; 6) any space might be danced in; 7) dancing can be about anything, but is fundamentally and primarily about the human body and its movements, beginning with waking. (Banes 1987: 6)

Following in Cunningham’s wake and from out of the concepts and their myriad applications as suggested by John Cage, artists such as Yvonne Rainer, Steve Paxton, Lucinda Childs, Trisha Brown, Deborah Hay, and Fred Herko, took these ideas further, some eliminating any presence of a technical dance training (as remained in Cunningham’s choreography) opting instead for pedestrian and functional movement to be performed by any body. Cunningham further spawned new developments in dance by inviting Robert Dunn to teach a composition class at his studio. (Banes 1987: 10)

In the 1960s Robert Dunn’s composition classes created opportunities for dancers and choreographers to break with the traditions of dance once again. Dunn’s encouragement of young dance artist’s development of strategies for dance composition included: “games, casual and quotidian movements, tasks, the manipulation of objects, the reciting of texts, the showing of films, and extensive exploration of improvisation.” (Salter 2010: 240) These strategies created no clearly defined aesthetic amongst the Judson artists and instead promoted the idea that dance could be any and all movement that are contextualized by the studio-based processes, practice and performance of dance. In discussion of the performances of Judson Dance Theatre artists a common feature is the “interest in exposing the structural foundations of movement”, the work-of-the-work. (Salter 2010: 228) In other words revealing the work of the action machines—the structures, games, tasks, principles that underlie the movement and generate its performance.

Whether the prevailing structure is a mathematical system for using space, time, or the body; or arbitrary assemblage; or fragmentation, juxtaposition, the deliberate avoidance of structure by improvisation; or the constant shifting of structures by chance methods, there is always the possibility, in post-modern dance, that the underlying form will be bared. (Banes 1987: 16)

For Judson Dance Theatre and choreographers such as Cunningham and Balanchine “the formal qualities of dance might be reason enough for choreography, and that the purpose of making dances might be simply to make a framework within which we look at movement for its own sake.” (Banes 1987: 15)

What emerged was an environment within which anything was possible. Any artist could be the choreographer and anyone could perform. Collaboration between artists and art forms became common practice and the space in-between them and the experience that this afforded the artists working collectively or sharing practice gave rise to new modalities in dance practice and performance. Choreographers “found structures and performance attitudes in new music, film, the visual arts, poetry, and theatre—especially in Happenings, Events, and Fluxus (a neo-Dada group), where the borders between art forms blurred and new formal strategies for artmaking abounded.” (Banes 1987: 9) At this time, artists came to be more concerned in the
studio-based process than in the completed choreographic outcome or product. The turning inwards of focus to the studio-based process and not the performance rallied against the turning outwards for the frameworks within which dancers and choreographers investigated human movement.

**ROBERT DUNN’S COMPOSITION CLASS**

As a group artists of the Judson Dance Theatre are perhaps the most-well documented experiments in ‘ex-quiry’. The dances presented at Judson Church may have appeared more as an exercise, task or game, and the artists presenting their work were articulate about their query across multiple representations, not only the embodied/danced presentation. Judson Dance Theatre as it came to be known, was grounded in the composition classes facilitated by composer, Robert Dunn.

Robert Dunn’s composition class came at a time when dancers and choreographers interested in their own dance composition “were dissatisfied with composition courses; these they felt, were too structured for genuine innovative exploration.” (McDonagh 1971: 77) Housed within the Merce Cunningham studios in New York, Dunn was asked by John Cage to facilitate a course in composition for dancers, and of the dancers and choreographers that attended Dunn’s classes were the Judson Group: Steve Paxton, Yvonne Rainer, Lucinda Childs, Trisha Brown, Deborah Hay, among others. It was through Dunn’s facilitation that their ideas about dance practice and studio-based processes emerged in their own individual fashion. Dunn’s facilitation style enabled and encouraged these young choreographers to think for themselves, solve problems, and be open to possibilities from wherever they may come. At this time in 1960s New York, ideas were shared between artists and practices from dance but also from other artistic fields—collaboration and multi-disciplinarity were some of the ways in which experimentation with ideas and an individual idiom in movement practice were arrived at. For Trisha Brown, Sally Banes suggests in *Democracy’s Body* that “one of the most valuable features of Dunn’s class was the way he approached analysis, not looking for the correct answers to the problems he set, but interested in whatever individual solutions his students discovered for themselves, and in helping them to understand what it was they had created.” (Banes 1983: 20)

Brown reflects:

After presenting a dance, each choreographer was asked, “How did you make that dance?” The students were inventing forms rather than using the traditional theme and development or narrative, and the discussion that followed applied nonevaluative criticism to the movement itself and the choreographic structure...This procedure illuminated the interworkings of the dances and minimized value judgements of the choreographer, which for me meant permission, permission to go ahead and do what I wanted to do or had to do. (Banes 1983: 20 – 21)

The performances that Dunn’s students gave at Judson Church in 1963 and 1964 marked a definite turn in dance and continue to inspire contemporary choreographers. Judson became recognised for a “focus for experimental work”, and
began to attract choreographers “who were drawn by the open atmosphere of the Dance Theatre.” (McDonagh 1971: 78) While not all choreographers who became enwined in Judson participated in Dunn’s workshops, the developments and influences of the artists at Judson left Dunn’s mark/trace thus informing newer artists. The workshop at the Judson Church that emerged after the first performances from Dunn’s workshop participants, “was not a formal course as was Dunn’s but operated more as a forum for dancers and choreographers to look at and analyse each other’s work.” (McDonagh 1971: 78)

Dunn’s facilitation style was derived from his experience as a student with John Cage. Taking on board lessons he had learnt from Cage, Dunn structured his classes as workshops within which composition assignments would be worked on and analysed. Dunn says that,

each assignment that I gave was only partially defined as to what I wanted and there were many, many choices that were up to the student. And in the discussion, following John’s idea of discussing and not evaluating, we concentrated on what we had seen. What was the structure, what were the materials, what were the methods. (McDonagh 1971: 82)

Task-based studio processes of choreographers’ today also create environments within which dancers negotiate many potential choices, options for movement, in response to the choreographer’s task. In this way the agency of the dancer and their choices in relation to the playing field constructed by the choreographer through the assigning of a task, score or framework within which they attend to the generation of action allows for an interpretation of Dunn’s non-evaluative paradigm. The purpose is not to dictate values of movement or prescribe movement to the dancers but rather propose the dancers own investigation. The investigation itself values the dancer’s history, their ideas, and directs their attention towards new possibilities or perspectives of action, their body and their ideas in space and time.

Throughout the same period that Dunn’s classes ran there was a collision of artists, artforms and ideas. Collaboration was encouraged by Dunn through his assigning of particular assignments to pairs to work on and present together. It was also through the collision of ideas that came into the classes with students encouraged to bring in whatever was at hand to contribute and open discussions about what they were interested and excited by that also led to collaborative perspectives on dance composition. With Cunningham’s studio as the epicentre and Cage’s influence across multiple disciplines, the ideas of artists, musicians, writers, designers and dancers were collectively explored.

The application of ideas within methodological constructs provides a conceptual basis for developing action machines. By developing structures that enable physical problem solving that is not explicitly tied to any tradition of practice of the body or technique dancers were able to begin to develop movement specific to the structure, task, ideas and methods designed. While the outcomes of these exchanges will always be to some extent a function of the history and previous experiences of the dancer, the structure of the action machine works explicitly against the replication of existing form, and drives the generation of new form/content. The discussions that followed
the presentation of dances I would suggest assisted the ways in which dancers began to think about how they developed their ideas, dances and practices. For my own purposes of ‘ex-quiry,’ I see this as a foundation that brought forward the structures of dances, frameworks that governed and directed movement investigations. In this way one might create a link to the developments at the same time in Motor Learning—the constraints-led approach. The constraints-led approach discussed in greater depth below can also be thought about in terms of a field within which particular tasks are set to draw out particular experiences and functionalities within movement performance. By developing systems of constraints motor learning developed methods to practice more than just the skill as rote, and instead create environments for learning where experiences accumulate and a variety of potential situations that arise from the constraints allow the players to create many more varied and possible paths and responses to physical problems and situations.

A CONSTRAINTS-LED APPROACH TO MOTOR LEARNING

Carrie Noland poses two questions in the introduction to her paper ‘Coping and Choreography’:

What happens if we look at choreography not as an aesthetic practice but as the production of puzzles for the body to solve, puzzles that require it to cope, to enact its kinaesthetic and proprioceptive capacities, in unusual and taxing conditions? What if choreography poses a singular challenge to our ordinary modes of embodiment, if it urges new bodies into existence that did not exist before? (Noland 2009)

I propose that external frameworks used by choreographers in studio-based processes place dancers in environments where they are actively engaged with tasks, ideas, situations within which they interact and develop movement solutions for choreographic works. The external frameworks themselves are specifically designed by the choreographer to elicit a response from their dancers. For each new choreographic work these frameworks may alter and the effect on the dancer—how they think and move, may be different. What this sets up are conditions for dancers where their development as dancers both technically and aesthetically may be continuously reconstituted as new, however small these alterations may be.

Alongside the developments of post-modern dance in New York during the 1960s, the scientific discipline of Motor Learning was developing the “constraints-led” approach. Where modern dance was breaking with traditions and seeking new approaches to human movement in performance, choreographic frameworks, ideas, methodologies and practices motor learning proposed the constraints-led approach as a framework within which participants acquire new skills through active engagement in tasks and activities designed specifically to target certain goals for skill acquisition. For both, the individual is central to the process, and their own unique experiences and genetic makeup are seen as key to the development of a functional and individual approach to movement problems. Across multiple and complex contexts where physical solutions may need to be readily available for performance, the constraints-led approach aims to develop many possible solutions and variations in the skill. In both
instances the display or performance of skills as rote is not as critical as the agility to adapt to and adopt modes in order to fulfil the task at hand.

Trisha Brown (whose work Locus will be discussed later in the chapter Action Machines) points to Robert Dunn’s class as formative in her development as a dancer-choreographer investigating movement and ideas.

It was in Dunn’s class that I was introduced to the notion that a chance procedure, such as the roll of the dice, can be the organizing principle in a choreography. The dice usurp the composer’s role to choose, and in so doing, reposition the units of motion that make up a phrase. They become objects that can now be put together in any order, random or determined. Abstraction seeps in. The personal choice in a well-tooled phrase that a dancer is trained to create is upended. (Brown 2002: 290)

The kind of propositions that Dunn facilitated in his choreographic workshops were echoed by Brown in her shared improvisation practice with Simone Forti. In their shared practice Brown and Forti “developed structures (a.k.a. rulegames) to impose coherence and a measure of control to the great unknown of anything goes.” (Brown 2002: 290) Like the constraints-led approach to motor learning structures the “rulegames” create a set of constraints for dancers to experiment with. These provide means to direct the attention of the dancer, thereby constructing a playing field that facilitates thinking-in-action and action-in-thinking. Brown says that, “I loved the give and take between idea and physical enactment with instinct sorting out the problems along the way. The body solves the problems before the mind knows you had one. I love thinking on my feet, wind in my face, the edge, uncanny timing, and the ineffable.” (Brown 2002: 290)

The construction of environments for experimentation with movement through rules and structures that seek to elicit responses and “exploit instinctive behavior when building vocabulary (dance phrases) for a new choreography” remain as studio-based processes for Trisha Brown. (Brown 2002: 290) For Brown creating situations such as putting “two dancers on a possible collision course, camera running to capture the masterly manoeuvres their bodies conduct in an effort to get past an impending accident while staying on their phrase” is a strategy deployed to capture movement that otherwise would not exist within the context of an already known movement vocabulary. Strategies such as this afford “a blend of memorized and instinctive movement” that the video camera captures for use in future rehearsals. Even though, as Brown acknowledges, “the dancer/body will never go that close to danger again”, as they are now familiar with the risk, “they have it on videotape to recreate the harrowing interlace and proximity.” (Brown 2002: 290)

Improvisation therefore became a method for Brown in her studio-based processes with dancers. Working with the video camera can be seen as a strategy for capturing masterful movement solutions to physical problems such as avoiding collisions and as a visual reference for herself and the dancers in rehearsals to come. Improvisation and the video camera are one method deployed by Brown. Finding the methods to share her ideas with her dancers Brown writes
If one is working with form and not formula, then the ideas take a visual presence in the mind and one must find a method to decant that vision. I start by describing the idea to the dancers, they query the request (I don’t blame them), I say the same thing with other words, they try, I articulate what is missing, they try again, process is in motion. We keep heaving ourselves at each other like this until one or the other breaks through. We have a beginning. The metaphor is physically in existence. Now we have a template as reference to complete the phrase (theme). (Brown 2002: 290)

Developing methods that create environments where the dancers are agents within the studio-based processes, integral not only as moveable parts but also as resources capable and insightful in their responses to the situations at hand places Brown’s dancers into a context of ‘ex-quiry’. For the dancers their process was a highly complex layering of “improvisation, repetition, and memorization of the aleatoric enactment of phrases according to instructions” provided by Brown. (Brown 2002: 291) In this way, dancers might be seen as collaborators in Brown’s studio-based processes. Their individual experiences and ways of interpreting Brown’s instructions are part of the choreography itself. And, their responses provide possible solutions to the physical puzzles that Brown’s scores and tasks elicit—these are dynamic systems, filled with varying constraints seeking to provoke multiple potential movement solutions from the dancers.

The emergence of the constraints-led approach in motor learning has its roots in the research of Nicolai Bernstein (1967) into dynamical systems and the research of James Gibson (1966, 1979) in ecological psychology. Movement scientists have undertaken further research to develop Bernstein and Gibson’s work into the current working understanding of dynamical systems (for example Clark 1995; Davids, Button & Bennett 2008; Haken 1996; Kelso 1981, 1984, 1995; Kugler & Turvey 1987; McMorris 2004; Newell 1986; Renshaw, Davids & Savelbergh 2010; Thelen & Fisher 1982; Turvey 1977). (Spittle 2013: 158) The use of constraints by physical educators, coaches and sports medicine professionals, facilitate the development of movement coordination patterns for learners and professional athletes alike. Influential factors within the learning environment act as constraints to facilitate the learners’ development of movement coordination and control. (Davids et al. 2010: 4) “Constraints are the boundaries that limit the movement capabilities – they include organismic constraints (for example in the individual’s intention and body structure), environmental constraints (such as the wind) and task constraints (for example the goal of the task).” (Spittle 2013: 158)

Understanding “pattern formation under constraints in complex neurobiological systems” provides the key concept for practitioners in the field. (Davids et al. 2010: 4) “The aim of a constraints-led approach is to identify the nature of interacting constraints that influence skill acquisition in learners.” (Davids et al. 2010: 3) Movement patterns are believed to be self organised based upon the constraints placed on the body. In the context of dance practice this is useful to understand. By examining the development of tasks, scores, equipment, technologies and their applications within studio-based practice it becomes possible to understand more about the ways in which dancer’s bodies are constructed and the ways in which action machine design emerges.
Newell (1986) proposed that constraints could be classified into the categories of organismic, environmental and task constraints, to understand how coordination patterns are formed during goal-directed behaviour. Organismic constraints relate directly to the individual’s characteristics. (Davids et. al 2008) They take into account the individual’s physical, psychological and behavioural characteristics, all of which function as resources and limitations to performance. Environmental constraints account for the physical and social environment. Environmental constraints may include: the floor surface (tarket, wood or tumbling mats), solo or ensemble dancers with/without a choreographer or director, shared rehearsal space or private studio, audience, lighting, and of course gravity. Task constraints are specific to particular performance contexts. Task constraints include the goals of the performance, rules, tasks and movement scores, equipment, surfaces, and boundaries. In each of the choreographer’s studio-based processes I have selected to examine in detail, one can see correlations to the affordances that each of these variables enables in the development of dances and the cultivation of dancing bodies.

Davids, Button and Bennett, in their book ‘Dynamics of Skill Acquisition, A Constraints-Led Approach’, provide an analysis of motor learning from within the framework of a constraints-led approach. Working from the point of view of ecological psychology and dynamical systems theory Davids et al. highlight how knowledge of the constraints that each individual needs to satisfy can help build a better understanding of key practical issues such as

- an objective structuring of learning and rehabilitation environments, including the design of practice tasks and the role of artificial aids;
- the nature and frequency of presenting augmented information to learners;
- the scaling of practice equipment according to individual needs; and
- developing a principled model of the learner and a rationale for the practitioner’s role. (Davids et al. 2008: 82)

A constraints-led perspective characterises “skill acquisition as a learner (a dynamical system) searching for stable and functional states of coordination or attractors during goal directed activity.” (Davids et al. 2008: 82) Throughout different learning phases humans create temporary coordination patterns that allow the movement system to remain in a state of instability. In complex environments such as sports and vocational environments, it is necessary to cultivate a repertoire of movements to negotiate the constraints of unpredictable contexts. This repertoire of attractors (stable states of coordination) Davids et al. consider to be “a kind of perceptual-motor landscape in which performers need to coordinate their actions with their environment in order to perform skills effectively.” (Davids et al. 2008: 83)

The perceptual-motor landscape assists in describing an individual’s intrinsic dynamics. For a contemporary dancer, the perceptual-motor landscape might include spinal rolls, turns, falls, jumps, tumbling, balances, gestures, walking, running and a multitude of other possible movements from both pedestrian and everyday movements to the movements of many so called “styles” of dance which may include ballet, breakdance or capoeira. The terrain is constrained and perpetually carved out by the interaction of
an individual’s genes, perception and intention, stage of development, prior learning experiences, physical constraints, social influences, surrounding information and system dynamics. These constraints are always in a state of flux, causing the landscape to be ever changing. Over time the constraints of individual learners change and the landscapes topology reflects these changes by dynamically opening the terrain to “the effects of development and new experiences as well as the acquisition of new skills.” (Davids et al. 2008: 83)

For dancers inside action machines, Davids et al.’s description of the process of acting ‘under constraint’ seems apt. They write that “…behaviour emerges under constraints during self-organisation, and motor learning is viewed as a personal struggle to implement change.” (Davids et al. 2008: 83) This description captures the individuality and dancer-specificity of each dancer’s process of assembling a potential solution to the physical puzzle is unique and relational to the action machines constraints. The consolidating effect of repeated encounters with a system is described in motor learning terms as a process in which “people learn to coordinate their movements with respect to the objects, surfaces, and other people in a range of environments.” (Davids et al. 2008: 83) Over time, people “seek, explore, discover, assemble, and stabilise functional and reliable movement patterns.” (Davids et al. 2008: 83) This description could very well apply to the repeated engagement, of dancers with the action machines they create as they seek, explore, discover, dismantle, and destabilise known movement to reveal, reimagine and construct another dance, another body in dance.

Within the professional dance terrain there are some well documented accounts of choreographic processes that foster this possibility for constructing new bodies in dance. For example, Trisha Brown’s Locus (1975) was not only a choreographic score for making a dance but also contains within the score her specific ideas about the body and how her individual way of moving might be communicated to other dancers—not via a codified technique like Graham or classical ballet, but instead via an interpretative system or score the dancers engage with or attend to. Merce Cunningham also offered dancers an opportunity to think about their bodies in action in new ways through the use of chance operations and later through the computer software LifeForms.

Carrie Noland writes in regards to Cunningham’s work that “the practice of choreography, of inventing new movement vocabularies and sequences for the body to execute, entails nothing less than the performative construction of that body.” (Noland 2009) A “performative construction” is the register of the action machines constraints and studio-based practice over time. Over time Noland observes the “result of iterated performances, the shapes of muscles, the length of ligaments, and even ways of ambulating and holding the body are all recast in order to satisfy demands that are neither socially mandated (part of a collective habitus) nor anatomically over-determined.” (Noland 2009) The effect of action machines such as Cunningham’s LifeForms, propose and exploit both the systems limitations and flaws and also those of the human dancer in relation to the system. For this reason, Noland suggests that the value of technology in studio-based processes is that they establish
environments that require “dancers to become virtuosos of coping, experts at adapting their own sensorimotor instrument to the situation at hand.” (Noland 2009)

Action machines, in a way that is very similar to a constraints-led approach to motor learning, create a field of reference to promote and provoke movement responses, and specifically a gradually cohering set or system of responses that stabilizes because it provides a successful set of solutions to the ‘puzzle’. Through experimentation, possible solutions to movement puzzles can be arrived at. The experiments within a constructed action machine generate many possible variations and responses to a specific movement puzzle. These variations allow for adaptability and versatility when taking on more complex systems and environments. The concept of the constraint is similar to the idea of directing attention of the dancer through the use of external frameworks. While the experiments themselves require the individual dancer to experiment with their body and its individuality the constraint or action machine offers a particular perspective or idea to direct and refine the potential movements that arise.

The application of a system such as Laban’s choreutic forms as a spatial structure, creates limits (constraints) for the body in some respects and at the same time promotes others. In this way, action machines, can be said to function similarly to constraints within the field of motor learning. As a process, the constraints-led approach to motor learning also offers a perspective on the design of action machines. Within the context of motor learning a constraints-led approach constructs a framework within which participants acquire new skills through active engagement in tasks and activities designed specifically to target certain goals for skill acquisition. While skill acquisition is not necessarily the focus of choreographic practice, the ability to design frameworks to elicit responses and produce affects within the body of the dancer can be garnered through the appropriate framework application within studio-based processes. Although one might not readily think in terms of skill acquisition for studio-based processes in dance, it is possible that through novel studio-based processes new skills may be acquired.

Constraints could therefore be said to operate as ‘ex-quiry’. They provide the performer a field within which to experiment and explore in ways that seek to foster and promote particular experiences. Over time the experiments and explorations bring about possible solutions and these can be further established as dynamic forms of new action within the body. Skill acquisition might be a by-product of ‘ex-quiry’ as the potential new movement and availability of new pathways for thinking and moving develop throughout engagement with new frameworks.

STUDIO-BASED PROCESSES AND PRACTICES OF EX-QUIRY

‘Ex-quiry’ takes place within the context of studio-based practices and processes. In the studio, dancers and choreographers work with frameworks that are designed to set-up particular opportunities to challenge, experiment, explore, examine or construct a specific way of moving, experiences, concepts, aesthetics and more.
meta, focuses on three forms of ‘ex-quiry’ in studio-based practices—equipment, technology and scores.

There are many other forms of ‘ex-quiry’ that exist in the practices of other dancers and choreographers. To contextualize meta within this wider range of practice, I have constructed a constellation of choreographers whose work exemplifies one or more of the forms of ‘ex-quiry’ identified above. The choreographers’ studio-based processes and practices I have chosen are: William Forsythe, Trisha Brown, Elizabeth Streb, and Merce Cunningham. I will describe their practice from their own perspective and the perspectives of others external to the studio-based practice who have also written about the work. The writings of the choreographers, researchers, and reviewers all offer a different lens or perspective on the work.

I have also developed a series of Physical Thinking Prototypes throughout the course of my studio-based research. These Physical Thinking Prototypes performatively enact ‘ex-quiry’ from the perspectives of technology, equipment and scores. These are examined as separate forms of ‘ex-quiry,’ although they are also inextricably linked and sometimes blur within an all encompassing study, just as a set of systems and processes within a dynamical system begins to cohere over time into a functional action/movement pattern. The aim is to seek to exemplify through dance practice how external frameworks can and do affect dancers’ bodies, movement possibilities and choreographic structures, and to do this within the context of the daily studio practice of dancing. In the case of my research project it is most acutely exemplified in the performance and installation META.

META

META, is a performance work, that arises from, and simultaneously underpins and enacts, in a creative space, the outcomes of this research. Positioning the research outcomes as and within a performance work enables me to represent the work as intertwining multiple threads of a constellation. While the concept of meta began in relation to my work as a dancer-choreographer for John McCormick in the development of his artificial intelligence agent and performance work Emergence, meta has become a way of thinking about all of my interactions with action machines. As a meta-narrative for the whole of my research project, a myriad of references traverse multiple platforms and linger within me. Meta is a platform of reference and the voice that traverses these pages, and within the creation and performance of Physical Thinking Prototypes.
METHODOLOGY AND METHODS

As my research has developed over the three years of my candidature, it has been crafted and informed by many external sources. These include: reading texts from dance practitioners and writers from fields as disparate as biomechanics and music sampling; live performances; video documents of live performance and; where available, studio practice; web-based materials conveying embodied knowledge and choreographic thinking; conversations with dancers; and participating in others practices. All of these filter through my body and form the synthesis of ideas presented across the many platforms—dance performance, written exegesis, installation materials, scores, sound score, edited videos, studio notes, blog posts, and not least my body. As this document unfurls it becomes more and more interwoven, constructing the platforms as a constellation as I attempt to best articulate the dancers’ (my) experience in studio-based processes. For the dancers’ experience is a constellation. It is never one thing, never one form of input, and even if it were, the temporality of the artform—project after project, collaboration after collaboration—would ensure that it could never be static, and never confined to a homogenous set of influences, knowledge domains or artistic paradigms. The frames below are my methods and tactics for articulating my experience within my own and other’s practice, and in relation to the practice of other dancers and choreographers.

During my research I spent a month (January 2014) training in the techniques/practices of both Pop Action (Elizabeth Streb) and Gaga (Ohad Naharin). It occurred to me that, like the work I was doing with John McCormick’s AI Agent and my own work with equipment, Gaga and Pop Action are also external frameworks that a dancer might be asked to work within to generate movement or experience movement possibilities from varying perspectives. Looking for further evidence in the studio-based methodologies of other choreographers, I began to trace a trajectory for dance practice in which the external framework developed both the practice and the bodies that perform the choreographic work. For me what is important is the studio-based process from the perspective of the dancer who is mostly likely to be in direct physical dialogue with the framework. While I am interested in the choreographic work it produces, it is not the choreographic outcome of the practice that is the register of my research. There is however an irony in this in that my research is almost always presented as a performance, that has been choreographed in some way to build structures that support my discussion of the studio-based processes which led to its being.

For me, studio-based processes—the daily practice of dance—is what drives me. The opportunity to work on physical problems, using my body to discover and access new ideas and ways of moving and thinking is what I love to do. This is what drives me whether that is as a dancer for others, an independent project, choreographic

---

3 Pop Action is the technique developed by Elizabeth Streb and practiced by her Extreme Action Heroes of her Streb Extreme Action Company. Gaga developed by Ohad Naharin is the practice of Batsheva Dance Company, as well as a burgeoning practice for dancers and non-dancers globally.
commissions, teaching, mentoring younger artists or acting as an outside-eye for rehearsal. In the studio multiple processes are happening at once, and the space between them is where my attention is most often directed because between processes is a field of collaboration that can give rise to the new ideas and ways of moving and thinking I seek.

The questions underpinning my research project are: What is the dancer’s experience of working within studio-based processes with choreographer’s external frameworks? And, what is the affect on their body over time? Derived from within my studio-based practice as a dancer-choreographer and as a dancer for others, the questions allude to my emergent concept of ‘ex-quiry.’ To examine this concept, I set up a series of opportunities (Physical Thinking Prototypes) within which to begin to notice when and how my attention is placed between myself and something else when I am working, creating some form of framework that I can be in dialogue with. Over time, the exchanges I have had with many frameworks have affected my physicality, in terms of both the types of movement my body creates—its physique, and through directing my attention or focus, developing new ways of thinking in, through and about movement. Each framework has provided a new set of constraints for directing my attention, eliciting particular movement responses and constructing my body.

To examine how the concept of external frameworks for dancers might construct specific dancing bodies I have assembled many diverse threads into a constellation. The constellation has been hewn from out of the practice of dancing and the thinking that dancing has produced in relation to others’ ideas within the field of dance and beyond. The practice of dance and the studio-based processes which support on-going practice spurred my thinking surrounding how the incredibly disparate practices I was working with might be connected. And, how the differences in the studio-based processes were constructing highly specific dancing bodies.

In the consideration of methodological frameworks appropriate for my research I am seeking out methods through which to experiment, experience and articulate ideas arising from the practice of dancing using different studio-based processes. My decision not to focus on a singular practice was made early, noticing that the multiplicity of the projects I was engaged in simultaneously required different bodies in both physical and cognitive senses. I was curious about the sense of different bodies I experienced and sought to discover more about the construction of dancing bodies in studio-based processes. Hence, a research project of multiple practices kept open the investigation into how different studio-based processes might construct specific dancing bodies. A salient example for the choice of developing a studio-based practice can be found in meta. As I moved back into my own solo practice after having spent time with John McCormick’s artificial intelligent agent I noticed the spill of my dance exchanges with John’s agent in my solo practice—its’ (the agent’s) trace that in a sense haunted my solo improvisation practice and chose to focus in—explore and experiment with this potential further. The work I have undertaken as a dancer

---

4 This idea of directing attention of dancers can be linked to the work of choreographer Wayne McGregor and his collaboration with Phil Barnard and Scott deLahunta.
Throughout my life has always had a collaborative framing. While changes to ones’ physical body and the strategies developed to think about physical problems, investigate and experiment in the studio can certainly be attributed to practice over time, what became apparent to me is the idea that, like training in a specific technique of the body, studio-based processes may also construct new bodies in dance. This is not about technique, but about strategies and applications of ideas in varying forms/frameworks to elicit ways of moving and ways of thinking through and in action to solve physical puzzles. While linking training to specific choreographers’ processes is not new, the assumption has most generally been that this is a singular process of immersion within the approach of a single choreographer and/or company over time. With the emergence of freelance dance employment as the new norm (at least within Australia, where few contemporary dance companies provide year-round contracts) the issue of the multiplicity of influences a dancer must negotiate becomes a driving force in their artistic development.\(^5\) This research addresses this shift, acknowledging that in this environment, it is the dancer who negotiates, integrates (or keeps separate) multiple choreographic lineages, philosophies and approaches.

Roche describes the process for the independent contemporary dancer as oscillating between stability and instability. In their practice:

\begin{quote}
By oscillating between stability and change, dancers demonstrate an intensified ability to repeatedly incorporate and integrate new motor skills that are imprinted on the central nervous system. In the way that new motor skills impact on existing movement patterns, choreographic engrams alter the dancer’s moving identity over time. The many layers of instruction and adoption of specific strategies form a corporeal map that, like a score, forms the choreography. This seems to be the plan that a dancer adheres to in performance, located in body sensation and internalised choreographic instructions. This plan is built through trial and error in rehearsals, throughout the process of anchoring ideas into the body’s tissue. As this map flows from a dancer’s corporeal relationship to the environment it forms a wider matrix that settles into a specific performance identity. Thus, dancers have moments of stability through which they can organise around a particular performance identity – only to be destabilised again within a new creative process. (Roche 2015: 97)
\end{quote}

Throughout this document and within the performance event I have chosen to speak from the perspective of the dancer-choreographer at work. I have endeavoured to sustain a voice located in the studio-based processes reflectively and refer outwardly as necessary to a broader field of ideas and histories intersecting my own research. It is an aim of my research to articulate the experience of dancing in external frameworks in the languages of the practitioners who actively engage in these collaborative experiments with movement—the voices of the dancers and dancer-choreographers themselves. I also seek for the studio-based processes to remain within the performance. Through practice the processes that bring the performance into being remain embedded and embodied. This approach gives rise not only to authenticity within the experience, but also provides accessibility for others who may

seek to refer to this research in relation to their own practice and experience within the field of dance and more broadly. Perhaps most importantly, I seek to create a constellation of the experience of working inside action machines across multiple platforms—performance, installation, blog, website, edited video, exegesis, and sound scores.

The constellation of moveable parts that constitutes my research is comprised of layers of experience that are distributed across multiple platforms. In more recent times, resources have been developed from choreographic practice, or, to use the term popularised by William Forsythe (2008), ‘choreographic thinking’. (Forsythe 2008) These resources (A Choreographer’s Score, The Dancer as Agent Collection; Material for the Spine; My Body, The Buddhist; RePlay; R-Research; A Choreographer’s Handbook; Everybodys Toolbox; Improvisation Technologies; How to Become an Extreme Action Hero; Synchronous Objects; Are we here yet?; and Motion Bank) exist as text publications, CD-ROMs, DVDs, and websites that offer specific lenses and frameworks for audiences to engage with the choreographic practice of dance artists. These exist as tools, strategies and invitations for viewers to access, engage and understand the complex inner-workings of studio-based processes and the development phases of choreographic works, which often take place behind closed doors and removed from the public arena.

Web-based publishing in terms of blogs, websites, digital archives, video and sound repositories have offered me (and others interested in dance practice) insights into the studio-based processes of dance artists. Some examples include; Motion Bank, Everybodys Toolbox, The Dancer as Agent Collection, Lifelong Burning, R-Research, and Synchronous Objects. These platforms allow for a sharing of ideas, knowledge, regarding the working practices of choreographers and in some instances may be the only connection for audiences who do not have the opportunity to witness the live choreographed performance works. And, perhaps more critically, for the most part, these audiences do not have access to the studio-based processes of the choreographer and dancers. Artefacts of the process including text, films, photos, sound/music used as the foundations for movement research sit alongside the artists’ own notebooks of written notes and drawings, and edited rehearsal videos. The exchange of these ideas via on-line, web-based platforms create forums for the discussion of what I have named ‘action machines’ within my research. The function of action machines is to elicit movement from dancers. The form that action machines may take is dependent upon the choreographer and the choreographer in relation to their collaborators, including dancers.

Writing in journals such as Writings on Dance, offers a scholarly perspective alongside artist writings. Such publications provide the rare opportunity for ideas, concepts and issues emerging within dance practice to be examined not only from an external

---


7 *Writings on Dance* edited by Sally Gardner and Elizabeth Dempster.
perspective of scholars but also from the perspective of the artists undertaking practice. This approach considers the artists’ process as an integral part of any choreographic analysis or scholarship. In a similar way, Scott deLahunta’s Motion Bank project, which has created digital forms of documenting and communicating the work of such diverse choreographers as Deborah Hay, Bebe Miller, Jonathan Burrows and Mateo Fargion unpacks dance process and practice as knowledge rather than just something that produces a dance performance. Throughout meta, the voice of the artist is critical to the discussion of studio-based dance practice. While embedded within scholarly discussion it is primarily the work of this thesis to define its contribution to the field of dance from the voice and perspective of the artist.

The iterative practice of knowledge sharing seen in web-based material, DVDs, books and CD-ROMs all serve the purpose of articulating bodies of knowledge and in the dissemination for a wider audience than the dance community alone. Resources such as Steve Paxton’s Material for the Spine, William Forsythe’s Synchronous Objects, and Anne Teresa de Keersmaeker’s A Choreographer’s Score, are part of an emerging collection with the imperative to make the thought in movement explicit, to develop prototypes for communicating in multiple forms—audio (the voice of the artist), video, handwritten notes, drawings, photographs and writing to effectively articulate dance practice. By working with digital technology and digital platforms such as websites and DVDs the spatio-temporal articulations of dance are able to be articulated in whatever the most suitable platform or multiple platforms for each specific idea within a project. Over the course of research or each individual studio-based process a lot of data can be collected. Data from studio-based processes might be assembled in much more woven spatio-temporal forms. The design of each can also be constructed from out of the data and the needs of the project.

I developed the following four frames (methods) within my research, thinking about these methods and their outputs as elements within a larger constellation of creative practice and development. These frames were: i) Studio-based Processes/External Frameworks, ii) Sampling and Physical Thinking Prototypes, iii) Annotation of Studio-based Processes, and iv) Performance and Installation. Seen as a whole, these, create multiple access points for viewers to engage with my studio-based processes. These include performances, edited video, images, notebooks containing notes written in the studio, a blog that assembles many of these elements to locate the audience within the studio-based process of working as a dancer, and the final ‘stars’ in the constellation—a performance, installation and written exegesis. The knowledge that I generate through the practice of dancing is located across, between and within each of these frames. The iterative practice of communicating the embodied discoveries made through dancing enabled me to construct multi-layered and multi-sensory publications that communicate studio-based practice in order to share my work. That these publications are for the most presented within the Appendix—on my website and within studio-based practice and performance is a failing of the requirement to present scholarly enquiry in a written exegesis. The expression and articulation of findings in dance practice are often subjected to the necessity of written documents which disavow dance practice of its true form and articulation in the terms that illuminate its knowledge—movement. My attempt is to find registers appropriate to
the enquiry taking place in the studio. For me the creation of _META_ as an installation and performance was the most successful.

The image of the constellation is a deliberate choice. The constellation mitigates against the possibility of a singular viewpoint. Constellations are always in motion and in relation to the other, just as we as human beings are also always in motion and in relation to the other. Motion, movement is the subject of my research but it is not an isolated event—it is relational. The relationship between the stars, the space, exists only as it is activated through the movement of the stars in relationship to one another and the universe endlessly expanding. The relation between ideas, experiences and potentiality is one that weaves within past experience, the actual event, and the collapsing of the event giving rise to yet another before the event can be grasped. Reflection opens the possibility to locate an experience and form a stronger image or sense of it, but in the moment is slippery and quicker than my ability to notice and grasp it—perhaps this too provides a dynamic attention always attending but at least 20 steps ahead of the event, the moment, the movement.

For my research the application of the constellation is useful for understanding how the written exegesis, web-based material, performance and installation, and appendix align. Together, as a constellation, they seek to provide their own iteration of _meta_—not providing the whole project, but interacting with one another to allow for a reading by the audience and the emergence of an assembly of thought from between the layers. Such an approach precisely makes an argument for the rejection of traditional scholarship, the valuing of the choreographer-centric model, and the perspective of the outsider writing on dance. Here, that knowledge is slippery in studio-based practice (particularly as a solo dancer-choreographer) is embraced in the presentation of the research projects knowledge across the multiple registers of the constellation.

1. **STUDIO-BASED PROCESSES | EXTERNAL FRAMEWORKS**

Studio-based processes form the core of my approach. My research questions are formed in relation to, and informed by, my on-going practices as a solo dancer-choreographer and as a dancer-choreographer-collaborator for others. The application of particular studio-based processes, practices, and physical experiments undertaken in the course of developing a new choreographic work is the primary method through which I conduct my research.

Studio-based processes can and often do construct highly specific bodies in dance. A process of enquiry in dance might be considered as a process in which the body is placed in dialogue with techniques, exercises, ideas, technology, another body, scores, equipment, objects, frames and so on. Placing the body “in relation to” the studio-based processes creates an environment in which external frameworks and dancers’ bodies can operate in relation to one another to experiment with potentials for action. External frameworks offer scaffolding for experiencing, eliciting, inspiring and uncovering possibilities for the human body in motion. They also may offer dancers strategies to work with, to stay engaged, change their perception, focus their
attention in specific ways or re-direct their thinking to offer new insights of possibilities for moving.

I have created and examined external frameworks from the perspectives of constructing/designing action machines for myself and of dancing within them. My studio-based processes are constructed a series as Physical Thinking Prototypes, each of which articulates the outcomes of an experiment in constructing and dancing within a specific type of external framework. Through this process, I aim to unpack the ways in which action machines function to effect change in my movement, and in my dance practice as a whole, and to begin to understand some of the unique insights into these processes that are available from a dancer’s viewpoint. The studio-based processes and action machines (external frameworks) are discussed further within the chapter Physical Thinking Prototypes and throughout digital platforms such as my website and the Appendices for the projects WORK, meta, project poser, and META.

2. SAMPLING AND PHYSICAL THINKING PROTOTYPES

A key concept for me in constructing physical thinking prototypes is the concept of ‘sampling’. Sampling provides a framework for experimenting with multiple layers and enables me to challenge what I think might be physically possible for a (my) human body in action. McLeod and DiCola’s description of sampling processes in their book, Creative License: The Law and Culture of Digital Sampling, has been influential in my development of this approach. They describe sampling as “...using a variety of media and methods, including cutting up magnetic audiotape on analogue equipment, physically manipulating vinyl records on a turntable, and remixing sounds using digital technologies like computers or drum machines, among other techniques.” (McLeod and DiCola 2011: 1) Dance sampling can also be configured in terms of many different forms or frameworks of process in the quest to create something new.

The advent of digital technologies within dance practice have enabled processes for choreographers that delink movement and the body of the dancer. (Cvejic 2015: 22) In her introduction to Choreographing Problems, Bojana Cvejic discusses a trajectory in dance considered through the “changing technology of choreographic production.” (Cvejic 2015: 22) Cvejic suggests that:

If the use of the video image in creating movement helped assimilate improvisation into the creation process in the 1980s and helped to disseminate the new studio practices of body-work, then editing the electronic image on personal computers has altered movement composition and staging since 2000, providing choreographers with a tool to compose movement that is delinked from the body. (Cvejic 2015: 22)

Sampling in dance practice might be thought about not only within the context of video but also within the context of choreographic agents (such as LifeForms, artificial intelligence and animation software Poser), scores and/or systems (Locus for instance), and equipment (bungee harnesses and aerial silks). The deployment of such external frameworks (all different forms of technology) create opportunities for “cuts” to be made and new potential assemblages to be arrived at. Here the construction of a body may be a perpetual construction and deconstruction, becoming and unbecoming at once through multiple breaks. The opportunity to destabilise dance
and dancers’ bodies that sampling processes afford can create the space of pure potential and a new dance, a new body from out of existing resources.

“Kid 606 explains sampling’s appeal in the following way: ‘It’s like Leggos. If someone said, ‘Here’s a bunch of Leggos, put them together,’ you have something to work with – as opposed to, ‘Here’s a bunch of plastic, mold it, and then start building it.’” (McLeod and DiCola 2011: 1) I understand the concept of sampling in my own dance practice in a similar way—what elements can I assemble, put together and organise into a movement/dance outcome. To ensure that what is put together is new, I need to find ways of sampling that do not simply ‘take the movement apart’, but which fundamentally reorganise it by parsing it in unexpected ways that dislodge its original context and logic sufficiently to prise open a gap within which to configure something new. In movement terms, this means paying particular attention to spatial and temporal patterning, ensuring that both are disrupted, made different. External frameworks provide the means to do this.

Sampling, functions pragmatically to enable space to consider many diverse dance practices—both my own and others, and to assemble the ideas and issues arising from within them. The use of sampling, as a way to practice and understand contemporary dance can be viewed in relation to Paul Miller’s (DJ Spooky) ideas regarding the culture of sampling and the nature of the ‘cut’ within it. For Miller “the word cut makes me think about roads and highways cutting across the landscape...you see all these geometric stratifications, layers of cuts.” From a dance perspective these types of stratifications create grooves and cuts to work within. Opportunities to play within cuts and grooves exist between movements, practices of the body, techniques of the body, ideas and concepts from any domain, between external frameworks and dancers’ bodies, between dancers’ bodies, and between the dancers’ and the choreographer’s bodies too. In the context of hip-hop ‘the cut’ might be thought about in terms of the way that urban planning in the Bronx levelled the land to construct highway systems and in turn “sliced through what were then different layers of class. Ghetto communities were much more affected by this road-building project than others were. That influenced how people viewed the community, which affected hip-hop music.” (Becker and Crawford 2002: 83)

Miller describes America’s urbanisation and gentrification as creating an environment where “everybody had to collage together their identities – white, blacks, and, after a certain point Indians because they got moved around so much and their tribes were broken up. This is the land of the blank slate, so it’s a cut-and-paste culture.” Now through developments in digital technologies and the internet “you can jump from website to website, paste together essays and sound fragments – it’s sampling. These issues have migrated almost fully intact to the digital age.” (Becker and Crawford 2002: 83)

This concept of the ‘cut’ as a collage of identity may also be applied to dance. In Robert Dunn’s choreographic workshops, for example, processes of collaboration, cross, trans or multi-disciplinary practice and applying ideas from diverse fields, equipment, technology, scores and specific environments all serve as methods within which a form of sampling occurs to develop the specific practice. In turn, a specific dance and specific bodies for performance are also constructed. Here, the “moving
identity” of independent contemporary dancers’ that Roche describes could be thought of as a result of the “sampling” that occurs based on career opportunities, choices and experiences of the dancer over time. And, Foster’s “hired body” also could be said to function as an ethos of ongoing “sampling” of experience, knowledge and methods to reconfigure and make available many different bodies/identities for the purpose of working as a dancer. A dancer engaged in sampling might be thought to propose a body in dance that continues to be redefined through practice.

In the context of dance practice in the digital age, the potential for ‘sampling’ is expanded through the ability to access, connect, share, and experiment with diverse studio processes and practices through the aid of technologies such as the internet and multi-platform publishing. A publication such as *Improvisation Technologies*, for example, demonstrates a particular studio-based process in action, and also makes this information available to others who may then engage with its principles, but, given they do so in isolation from the original studio context, necessarily shift and interpret the ideas in different ways. (Forsythe et al. 1999) While the one hand always runs the risk of diluting this work. The other, makes some of Forsythe’s studio processes widely available and in this way provides opportunities for new users to explore in ways that may be naive to the original context—this very non-prescriptiveness enables the spawning of new ideas and a rich field of play in which new dances and new dancing bodies can emerge.

Physical Thinking Prototypes have become a method through which I have attempted to separate out and sample different forms of sampling as an approach to ‘ex-quiry’. My Physical Thinking Prototypes have sought to focus attention on Equipment, Scores and Technology as external frameworks that could affect the body of the dancer in different ways. The prototypes I have made with equipment form the basis for the performance *WORK*. *WORK* began as an experiment with a pre-existing solo and asking further questions about the concepts of endurance, tasks, training, and multiple bodies in terms of sampling as a process taken from music sampling, and in relation to the idea of constraints as described in the constraints-led approach to motor learning. As I investigated biomechanics and motor learning as possible frameworks through which to analyse dance and what the application of these analysis methods might mean in the construction of a dancing body, I adapted these ideas to revise the original choreography of *WORK*. The outcome of this process was to uncover the movement-changing and practice-changing potential of this approach based on sampling. I then looked to other methods of sampling, based on other kinds of Physical Thinking Prototypes to create further new works, culminating in the performance, *META*.

I adopted the notion of ‘Scores’ as method throughout these studio-based processes. Developing a method for scoring—marking, segmenting, and organising both movement and concepts—was necessary to enable me to work with the idea of sampling, since without a scoring process, there is no consistent basis on which to ‘sample’. Scoring forms the conceptual framework within which sampling becomes possible, and presents a kind of semantic overlay across both movement and artistic concepts that provides me with the tools for experimentation.
During a collaboration with John McCormick, his AI Agent\textsuperscript{8} provided a different form of external framework. In response to this experience, I developed a method of scoring using the remembered traces of the embodied experience of working with the agent. The resulting scores offered me a framework to experiment with what I felt was a new way of moving developing in my practice. Using my memory of the embodied experiences of this ‘dialogue with agent’ provided a level of abstraction from the original content of the work ‘Emergence’ that enabled me to assemble a framework within which the embodied elements (outcomes) of this work could function as a means of organising and structuring a new engagement with a new external framework. The application of technological frameworks such as the animation software Poser, also created an opportunity for scoring (and subsequently sampling) in order to explore the construction of ‘new bodies’ for myself, which were then articulated in the context of the performance work meta.

The Physical Thinking Prototypes I have constructed within my own dance practice and those that I have identified within others provide another sampling of incredibly diverse studio-based processes in dance. The process of sampling, of creating a constellation from the diverse practices has orchestrated my thinking and provided the means to assemble my research. Sampling is necessarily diverse and seeking of responsiveness and adaptability. It is a method that seeks to sustain the instability of dance—the ever adaptable, ever changing body of the dancer in different systems. Focussing strongly on studio-based practice enabled a multi-directionality to encompass the many possible trajectories, paths to be investigated. Sampling expanded relationships between potential elements and enabled divergent thinking, practice and intuitive pursuits in multiple directions and across multiple platforms—dance, web-based, video, sound, and writing.

3. ANNOTATION OF STUDIO-BASED PROCESSES

As my research advanced the necessity to find formats for documenting the studio-based processes beyond my handwritten notes in my journal became apparent. The many moveable parts, myself included, express their thinking in diverse ways. As such, the need to document and represent that thinking required multiple forms and to exist as thinking does in the studio, in motion—between, within and across multiple platforms.

For me the act of writing has gained momentum through blogging. By finding my voice within the context of the blog post, I have been able to assemble my thinking in a visual field connecting video, image and text in a single frame that allows for a criss-crossing of thought modalities.\textsuperscript{9} In the same way that my attention can ping-pong within studio-based practice, diverting between myself, external frameworks, readings, sounds, others’ performances, and other “bodies” in space, so too can my thinking divert and re-assemble through multiple mediums collaborating within a

\textsuperscript{8} See http://www.johnmccormick.info/category/emergence/
\textsuperscript{9} See http://stephhutchison.com
single space. I developed blogging as a method for annotating my research practice and to sustain a dialogue with my supervision team. The blog situated now within my website provides a framework for assembling my thinking. The visual nature of arranging multiple materials within a single platform, the web-based blog page has enabled a layering approach. There I am able to share with others ideas as they enter into my practice and my studio-based process as it unfurls in multiple directions at once. Within the blog I am able to attach edited video, images of my notebook containing handwritten notes, further written reflections typed into the blog, sound scores, and still images. As much as possible it was important to sustain my process of documentation as I went. To allow the necessary expression for each part of my research and the ideas as they emerged to be articulated as I was working rather than six months later.

For *meta*, I sought to challenge the ways in which knowledge, insights, and ways of thinking about dance as a discourse are typically presented. I have deliberately worked on sampling and the development of iterative practices and registers for my thinking to enable me to present *meta* in its’ escaping form. The digital sources provided within the appendices (in web-based form and on USB) attempt to capture practice as it continually escapes the neat confines of the exegesis and a traditional methodology. Moreover, the method of distributing *meta* enables and positions dance discourse (in this instance my research meta) within a broader context and milieu. That *meta* might in the process offer something to the dance profession and wider community is precisely part of the significance for presenting my research through such platforms. Why tie PhD research to the confines of an exegesis that may be read by a few? The web-based publishing of *meta* allows for and enables the widening of dance discourse and seeks further engagement with industry and community, in and outside of dance.

4. PERFORMANCE AND INSTALLATION

Within the practice of contemporary dance it is common for choreographers to attest to certain ideas, concepts and studio-based processes within their program notes for the performance event—‘output’. As a dance artist I too mobilise ideas using my body and seek to demonstrate and document these within performance events. For me, the creation of performance events only arises from out of an intensely researched studio-based process and practice that I seek to weave into a whole without diminishing the sum of the parts. I seek to offer within the work itself, the work of the work. To make apparent, or as apparent as possible, the underpinnings and the relationships between the many cross currents. The idea of the constellation also shines within my performance and installation, *META*. 
ACTION MACHINES

Each of the choreographers I have chosen for my research constructs their external frameworks in very different ways and for very different purposes. Movement, choreographic, spatial and conceptual concerns all give rise to the need to develop methods or processes in the studio to assist in the research of a potentially infinite set of movement possibilities. While techniques of the body such as ballet, release technique or Pop Action provide a basis for further movement investigation it is by directing dancers’ attention through the deployment of action machines that choreographers continue to construct, re-imagine and re-propose what movement in space might be available to human bodies. While the concept of “movement invention” may no longer be current within contemporary practice, invention or design of movement to best present ideas or concepts in performance is. It is significant to think about the design of movement for each specific context, and for each set of methods and systems that one enters into dialogue with. The notion that action machines present opportunities to investigate movement potential is therefore not primarily about skill acquisition or the development of extremely complex movement phrasing, or technical mastery but rather about the design of articulate movement solutions for physical problems.

PROTOTYPES

In what follows I seek to draw attention to a group of choreographers whose studio-based processes can be viewed strongly as prototypes for the kinds of external frameworks that promote ‘ex-quiry’ by dancers. The choreographers: Elizabeth Streb, Trisha Brown, William Forsythe, and Merce Cunningham each provide one or more possible prototypes for what I have come to call “action machines”. Their systems/studio-based processes propose external frameworks such as scores, tasks, equipment and software to direct dancers’ attention and elicit movement responses for physical puzzles. As the prototypes unravel by choreographer, I am seeking to draw lines between them. The lines I draw follow different tangential threads and seek to arrive at a perpetually mobile conceptual construct of action machines. Action machines within the context of contemporary dance practice do not seek to be fixed but rather seek to remain ‘active’, hence in flux and interchangeable/sample-able to meet or solve movement puzzles and propose ways of moving in or as dance. I seek to draw out the ways in which specific action machines offer a methodological framework to enter into a dialogue with philosophies of the body, techniques and poetics in dance.

Merce Cunningham | LifeForms

Cunningham’s work with technology forms something of a bridge in that his engagement with digital technologies opened the concept to many other choreographers. LifeForms is a computer choreographic software tool developed at Simon Fraser University. LifeForms provides an interactive and graphical interface to enable choreographers to map movement ideas in time and space. Choreographer Merce Cunningham was the first to work with this software for the creation of his
choreographic work ‘Trackers’ which premiered in 1991 at the New York City Centre Theatre. (Cunningham 1991)

In Cunningham’s work with LifeForms we can see the “cut” as a break in the tradition of making dances on dancers’ bodies to making dances first within the software program. A further cut within the studio-based processes of Cunningham working with LifeForms occurs as dancers interpret computer-generated choreography that may not contain logical chains of movement. For Cunningham’s dancers this meant having to renegotiate their bodies and develop new strategies and movement design to recreate the computer-generated dance.

Cunningham refers to his dances (and by token dancers) as being highly technical, but acknowledges that they do not end there. “It’s not enough to study a technique until you arrive at the point where you’re skilled. I think many people stop there and think that’s adequate. I always thought of that as the beginning; you have to go further and, as John Cage once said, make a few mistakes, so it’s human and not rote.” (Cunningham 2004: 14) To this end Cunningham has deployed many technologies throughout his years as a choreographer, and I include chance procedures within the idea of a technology. From Cunningham’s perspective “dance computers... can take you even further” towards new imaginings of the body, space and time. The computer is a tool that enables Cunningham to open his “eye to other ways of seeing or of making dances.” In the case of LifeForms, “if you put a computer-generated figure in one position and then into another, the program does the transition from one to the other.” The purpose for Cunningham is that the “resulting movements may be more peculiar than a body would tend to do. That interests me.” (Cunningham 2004: 17) Cunningham has constructed studio-based processes for dancers that seek “to discover the ways human bodies produce themselves (how they refine their capacities and thus assume new shapes) in relation to technological environments and situated demands.” (Noland 2009)

Cunningham describes his process with LifeForms:

Before I meet with the dancers these days I start by making movement, which I may have worked out to some extent on the computer. Then I bring it to the dancers and work with them within my capacity but also within their gifts. I show them first what the legs are doing. Then I add the torso and finally the arms, so they all know all the material. But then I can break it down into who does what, when they do it, and where. That’s when I begin to see what we have and change it if need be. The changes may be for practical reasons, or because I now see other possibilities. (Cunningham 2004: 17)

The influence of John Cage within Cunningham’s choreographic practice includes Cage introducing Cunningham to chance operations and the I-Ching. The external frameworks that Cage introduced Cunningham to were, in dance terms, radical since they literally cut across the ‘flow’ of the dancers’ movement. Randomising the order of movements impacted not only the movements themselves but also the transitions between the movements. These processes underpinned the radical and original nature of Cunningham’s choreographic practice and thinking in dance. In addition to separating movements from each other by re-sequencing them, Cunningham also
separated music from dance and movement from its usual temporal structures, using chance procedures to relieve the body of habit and open up new movement potential. Cunningham presented possible movement sequences and phrasing for his dancers to work out how to achieve—which may or may not have been possible, and then to what Cunningham refers to as “dance computers”—computers as a method for deconstructing dance.

The complexity and challenges inherent within Cunningham’s choreography and in the studio-based processes he gave his dancers can be found within the idea of movement enchainment. From a dancers’ perspective the use of chance procedures and computer software such as LifeForms created situations for dancers where their training to date (in ballet often) was no longer something to locate their bodies in space—the movements proposed by the processes Cunningham used required that dancers be able to “augment their ability to enchain movements never enchained before in either everyday life or the traditional technique classroom.” (Noland 2009) For Cunningham the purpose is not “simply to do a trick. These are not tricks to me, but real things that are in life.” (Cunningham 2004: 17)

For Cunningham chance procedures, “present (a) mode of freeing my imagination from its own clichés and...a marvelous adventure in attention”. (Vaughan and Harris 1997: 87) What this means for dancers is that their problem solving processes of how to move from one movement to the next, as determined by using chance operations, and perhaps in a way that is inorganic or not usually performed together (enchained) becomes the aesthetic and the performance itself. In this way the “human drama on stage”, derived from the practice of directing dancers’ attention, also creates the expressive content of the work through its performed practice. (Vaughan and Harris 1997: 7) As technology advanced so too did Cunningham’s choice of tool. Cunningham’s choreographic tools such as chance, camera and computer software each offered opportunities for Cunningham to experiment with other possibilities, other perspectives of movement, space and time as constructed in relation to the tool that provided the initial starting point for the movement and in relation to life itself.

Trisha Brown | Locus

In Speaking of Dance, Trisha Brown describes her body as something that “doesn’t even really belong to me, although I’m in charge of it... I just had this piece of machinery that was looking for a driver, a pilot.” (Brown 2004: 60) With the creation of the score Locus in 1975, Brown developed “a participatory equation and a living document.” (Nicely 2005: 58) Through the score Brown created far more than a dance for performance, she created “a tool for learning and the means of exercising embodied knowledge.” (Nicely 2005: 58) For herself, this afforded a means “to teach herself her own movement”, and for herself and other dancers the practice of Locus engages us with “a pedagogy for the mind and body within directed action.” (Nicely 2005: 58) Locus is an example of what Brown came to describe as “dance machines”—“that can take care of certain aspects of dance-making”. (Brown 2004: 60)
One might read the highly nuanced and sequentially articulate body of Brown in terms of language construction. If movement, like letters or words, are the building blocks or ‘Lego’ (to return to the analogy of sampling from Kid 606) of dance making, Brown is compelled to perpetually mine the potential of her machine, instrument—her body—for new components to use. Dance machines, like Locus, as Nicely suggests, elicit “a situation in which mind and body inform one another to create a dynamic present moment. Dance and choreography unfold together, and this condition allows us to speak not of the body or from the body but as body.” (Nicely 2005: 58)

Trisha Brown’s designs of dance machines that can take care of some of the dance making for her also create opportunities for invention. Brown’s allegoric score for her work Locus provides an exemplar of this kind of process, as well as providing an insight into Brown’s seminal work in developing her approach. The dance Locus represents Brown’s experiment within an imagined three-dimensional cube. Brown describes the construction of Locus as being:

organized around 27 points located on an imaginary cube of space slightly larger than the standing figure in a stride position. The points were correlated to the alphabet and a written statement, 1 being A, 2, B. I made four sections each three minutes long that move through, touch, look at, jump over, or do something about each point in the series, either one point at a time or clustered. There is spatial repetition, but not gestural. The dance does not observe front; it revolves. The cube base is multiplied to form a grid of five units wide and four deep. There are opportunities to move from one cube to another without distorting the movement. By exercising these options, we travel. The choices of facing, placing, and section are made in performance by the four performers. This describes the structure of the dance—you have to fill it in with the kinds of movement. (Sulzman 1978: 118)

While the cube provided Brown with an imaginary structural framework within which to construct movement, Brown took her process further by creating a score from a simple autobiographical statement. The development of the conceptual framework for Locus is complex and multilayered. One might view the development of the framework as a form of looping, passes or iterations of thinking and action in process. The different stages of scoring of Locus involved Brown first numbering the points of the cube, 1 – 27, and then ascribing a series of autobiographical statements as a score to correspond to the points on the cube. Movement was created from the position of working/dancing inside the cube to develop ways of “responding by touch, gesture, or simple indication to the twenty-seven points”. (Sulzman 1978: 122) Moreover, from development to ongoing practice, ‘Locus’ might also be said to have its’ own overlapping constellation of registers. As Nicely points out, “there is the dance as it was originally conceived, the score as a choreographic directive whose cubic structure defines a particular body scale and way of moving, the movement sequence that functions today as a warm-up, and the issue of language in relation to both Brown’s and our own dance practice.” (Nicely 2005: 58)
One might suggest that Brown’s practice of drawing and scoring her choreography for *Locus* creates a method for directing both her own and her dancers’ attention. Through the act of drawing/scoring Brown was able to articulate the “elusive-ness” of her movement and begin to create structures (external frameworks) to layer the experiences and aesthetics of her movement for others. (Goldberg 2002: 39)

The sketches graphed for the first time multilayered, multidirectional movements that Brown had experienced before only in ephemeral, unrepeatable improvisations. She built up moves simultaneously forming multipoint gestures, and the drawings gave Brown a new tool—a way to memorize even more complex, spontaneous movements and teach them to her company members. (Goldberg 2002: 39)

Brown notes, “The cube graphed the movement. It was a way of touching movement in my mind.” (Jowett 1976) The directing of attention provided by the score and imagined structure of the cube enabled a form of thinking in movement that complemented an open, dynamic, fluid irregularity to the movement as it came out of her body into the locale of the cube.

Brown’s attention and insistence of sustaining the process throughout the development of four separate versions (to develop the four sections of the dance), each with it’s own set of moves, developed a set of constraints that liberated the body and offered limitless possibilities for action.

By remaining within the imaginary cube, adhering to the sequence of numbers (which were once letters and words), and using only one or several of the twenty-seven points as her sources for a given movement, Brown had immersed herself in self-imposed restrictions. Yet at the same time she had at her fingertips all she needed to invent a new language and explore its infinite possibilities. (Sulzman 1978: 122)

Through the score and the imagined cube Brown not only spatialized her movement in a way that was possible to memorise but she also developed a dance language. Brown’s dance language is affected by the scoring process and practicing the score, and also by her use of the “space between words” located at number 27—right in the centre of the cube. Nicely suggests that we can “now also read this centre as the place without which language would cease to make sense—a space passed through. It is a metaphor for Brown’s movement style, which is composed not so much of steps but of the quality and approach that links them.” (Nicely 2005: 60)

The structure of *Locus* offers a kind of Lego-likeness, in that the structure of the score contains all the necessary architecture which, as Sulzman suggests, mines and expands the creative resources and, in the process, opens and liberates the imposed structure...although the cube confines the movement of *Locus*, its structure opens up the dance by suggesting possibility of multiple facings...the form of the cube is easily imagined and reproduced...dancers can move from one cube to another, or change facings, without altering the movement or its precise location within the cube. (Sulzman 1978: 123 – 124)

Sulzman shifts between describing the rigorous structure of *Locus* and her perspective as a dancer within the cube in her paper ‘Choice/Form in Trisha Brown’s *Locus*: A View from Inside the Cube’.
On one level, then, I inhabit a cube, dance the movement, proceed on my own as though enclosed and involved in a private world. On another level I shift facings, move from one cube to another, make countless, split-second choices, and dance as one among four. (Sulzman 1978: 124)

The experience of dancing *Locus* is one in which the dancer’s attention is directed by the external framework (the cube and the score) and at the same time leaves space for the individual dancer to puzzle, question, make choices and act/react with agency in relation to the score and the dancers with whom they share the dance. Their cube is at once isolated and interrelated or connected to the other dancers.

On this level I have access to and participate in the total structure (which includes the unknown) of the piece. This second situation is a crystallization of the first, just as the form of the single cube gives rise to the full structure of the piece: four dancers; four possible fronts or facings; mobility without distortion of either the movement or its location within any of the cubes; and, finally, the enormous range of potential interaction to which the dancers have access both by choice and by chance. (Sulzman 1978: 124)

The construction of the conceptual external framework as an open system allowed for a balance between “order and chaos, formal choreography and structured improvisation, predetermined movement and indeterminate forms, in order to incorporate as much material as possible”. (Sulzman 1978: 124) The interplay between rules, design, tasks, set materials, imagined structures (cubes), grid floors, multiple facings, the choices of the dancers, and possible moments of dancer synchronicity all created a dynamic aesthetic. As much a product of Brown’s choreography as of the dancer’s engagement with the score the complexity of the system begins to be revealed throughout the performance.

The score for *Locus* brought together many elements of Brown’s stance from her ‘anti-dance’ years: the belief in ‘pure’ movement without connotation; cross-media experimentation with linguistics; invented but simple geometric shapes; a focus on compositional structure rather than movement ‘content’; and the integration of dancer and environment (here, the imaginary cubes). Yet, paradoxically, *Locus* was also a pathway back to technical dance for Brown: its moves, although still relatively basic, could not be performed by non-dancers; and its graphing system provided a way for Brown to transfer her own highly complex, technically advanced and innovative improvisational moves to other trained dancers. (Goldberg 2002: 39)

**William Forsythe | Improvisation Technologies**

The CD-ROM, *Improvisation Technologies*, was developed by William Forsythe in collaboration with his dancers and ZKM Centre for Arts and Media Karlsruhe (specifically – Volker Kuchelmeister, Nik Haffner and Christian Ziegler). Jeffrey Shaw, then director of ZKM Institute for Visual Media, posits that via the CD-ROM, Forsythe gives us keys to the base of his improvisation methods, opening a broader realm of understanding and appreciation of his achievement. Furthermore, the creators of the CD-ROM themselves have developed a methodology of description – a unique design interface – that effectively embodies and elucidates these improvisation technologies. This makes the CD-ROM a Forsythian work in its own right, in which his associates (dancers, designers, programmers, and editors) perform under his direction with the
semantic and sensuous virtuosity that distinguishes his choreographical work. (Shaw 1999: 9)

*Improvisation Technologies* differs from forms of dance notation such as Laban, in that its purpose is not to document a dance as it is intended to be performed. Rather, Improvisation Technologies seeks to provide ‘keys’ that function as ways in to understanding Forsythe’s studio-based methods. Working with a team of designers and programmers enabled Forsythe to develop methodological strategies to share his studio-based practice. Drawing on to video via computer animation of hand-drawn lines, edited video, recording movement exemplars, and providing verbal descriptions/annotations by Forsythe combined to create a video prototype that demonstrates the improvisation concept. These processes offer the ability to draw attention to, and suggest how a concept might be experimented with, thus inviting viewers/dancers into the shared practice and shared language of Forsythe’s studio-based practice with his dancers. In this way Forsythe was not only sharing his embodied knowledge but also sharing (and perhaps even extending) his physical thinking via the drawn animations.

Intended as an extensive document of the procedures used within choreography and improvisation, and as tools for generation, refining and/or adaptation of movement, in the first instance *Improvisation Technologies* was used as a form of induction manual for new company dancers. Forsythe states that, “It explains the basics of seeing motion by leaving traces. It makes certain principles very easy to comprehend.” (Forsythe and Haffner 1999: 16) Additionally, the value of these principles both within and beyond the company, long-time dancer and collaborator Dana Caspersen suggests is that these procedures promote the development of “the dancer’s own curious mind”. (Caspersen 2007)

In developing “the dancer’s own curious mind” Forsythe is clear that *Improvisation Technologies* is “not telling you how to invent motion, but deals with the very important point just before the invention of motion.” (Forsythe and Haffner 1999: 16) This not a technique of the body, set to inscribe the dancer’s body with a defined set of principles, postures, and tonus. Rather, through the introduction of “simple concepts” Forsythe offers “a way of feeling and sensing for the individual dancer, and so it’s about inscription and about how to write clearly this way.” (Forsythe and Haffner 1999: 16) However it is important to remember as Forsythe says “that it’s just one way of writing clearly – we also use other methods when we’re working. It’s one way of thinking, but ultimately it is just a way of developing the physical sense of relationships between motions.” (Forsythe and Haffner 1999: 16)

Alongside the development of dancers’ abilities to sense motion and the relationships between different forms of motion, Forsythe is aiming at developing their capabilities as movement analysts. It is not about telling a dancer how to move or how to improvise, but rather seeking to build a framework around the process of analysis while you’re improvising. “If you’re dancing, how do you actually say what happened? The technique is one way of taking mental note of what just happened to you while improvising.” (Forsythe and Haffner 1999: 17)
As frameworks, the improvisational concepts provide dancers with representations of the inner logic of Forsythe’s own working body, and act as keys to negotiate the improvisation methods and conceptual structures at play in the studio. Forsythe’s extraordinarily complex vision and curiosity to perpetually re-examine dancing necessitated the need to develop tools for what is happening while he is improvising. Forsythe explains:

My body naturally moves very fast, so I guess a lot of the technique resulted or developed from the necessity of observing myself at high speed; I needed something to help me analyze what’s going on at high speed. In itself, it’s not choreography, but rather a tool for analysis. Hence the title: A Tool for the Analytical Dance Eye. (Forsythe and Haffner 1999: 17)

Working with classical ballet dancers, Forsythe’s design of Improvisation Technologies works with the familiar geometric principles of the body retained from the equally rigorous classical training. Forsythe notes that “thinking in circles and lines and planes and points” is common for ballet dancers so “this system is basically a manipulation of their existing knowledge.” (Forsythe and Haffner 1999: 17) Through the application of conceptual frameworks in Improvisation Technologies, Senta Driver also points out Forsythe has taught classical dancers to generate their own material by applying structural devices to their familiar techniques. Drawing upon the theories of Rudolph von Laban, which Forsythe has carried forward in what he calls Improvisation Technologies, he vitally expands the movement vocabulary. (Driver 2011: 52)

Ideas such as ‘shearing’ are offered within short demonstrational video files in a manner to describe the conceptual framework without providing a specified solution. The dancers are provided with a resource external to their own body to assist their experiments and practice. Through engagement with the frameworks highly trained dancers are provided with a framework outside of their technical training and their capabilities in turn are often extended. The dancers develop their abilities “to coordinate in highly complex ways, creating folding relational chains of impetus and residual response, using isolation and extreme articulation of head, neck, hips, torso and limbs.” (Caspersen 2007) Caspersen poetically describes this “body is a continuum, like a body of water; all parts are continuously alive to the others.” (Caspersen 2007)

Long-time dancer and collaborator of William Forsythe, Dana Caspersen describes the role of the dancer within Forsythe’s work. In the case of Forsythe and the Ballett Frankfurt the ideology is one of a “choreographic ensemble”. Viewed as a choreographic ensemble the dancers are often involved in several sides of the creative process, choreographing, writing text, making costumes, writing music, creating sets, etc., so the dancers in the company are fellow artists and colleagues, people who are interested in Bill’s work, but who also have their own art hearts and minds and don’t wait for orders. Bill is an excellent enabler; he has great faith in people and welcomes ideas. He looks for people with what I would term dance intelligence: curiosity, fearlessness and the desire to continuously re-approach dancing. (Caspersen 2007)
Not unlike Trisha Brown, Forsythe “consistently seeks to re-imagine himself and the dancers” creating a “wildly rich environment.” Caspersen describes
  The work we do takes place on many levels, but always comes back to the undeniable fact of the body: its capacity for oceanic depth and complexity, its simple pressure against the air, the intricate nature of its thought, its states of oracular, dreamlike possession. (Caspersen 2007)

Elizabeth Streb | Action Machines

STREB Extreme Action Company hold open rehearsals at their S.L.A.M. studio in Williamsburg. Here, I have had the privilege to train in Streb’s Pop Action technique, learn the STREB repertoire alongside current STREB dancers and more recently watch Elizabeth Streb rehearsing the company before their performance season in September 2015. I am keenly interested in studio-based processes and the dancer’s experience, so witnessing rehearsal processes provides the experience of watching the work of the work.

Elizabeth Streb describes the equipment with which her dancers propel their bodies into new realms of space as Action Machines. It is from Streb that I borrow the term action machines. However, the use of terms such as ‘dance machines’ and ‘dance computers’ can also be found within the language of choreographers such as Trisha Brown and Merce Cunningham respectively. For Streb, the Action Machines are designed to assist in her ongoing enquiry into the human potential for flight, to access new places in space. Flight and the potential of the human body in action came to the fore for Streb as a child noticing the movement of a fly in a jar. In her book, How to become an Extreme Action Hero, Streb recalls:

  I first realised I wanted to fly when I caught a fly in a mason jar. Wow! I wondered, how do they do that? I fell in a confused love with their erratic and immediate shift of direction and their untraceable flight trajectories, impossible to memorise...It all started with a fly, then came my attention to equipment and hardware and things that moved: knobs and gears, even if nonfunctional. (Streb 2010: 97)

For Streb;
  Access to a new place or situation in space usually requires a new piece of specifically designed action equipment or Action Machines. The Action Machines at STREB - the wall, fly machine, bungees, wheels, boxer harnesses, ply-wood, pipe-grids, walls, and trampolines - are our spaceships. They enable us to travel to unknown, un-traversed topographies. These beautiful action contraptions are our ground-shifters and force-implementers. (Streb 2010: 83)

Streb designs her machines based upon her imagined sense of where a body may yet to have been in space. Streb states, “I develop the ideas for machines to help me address my first question about space: Where have I not yet been? Of course, there is irony in posing this question. Clearly you can’t know where you have not been if these places have no name.” (Streb 2010: 84) Her idea of space in dance is not limited to the ground surface of the stage but seeks to access as much space as possible both above and below the body of the dancer. To access spaces yet to be occupied by human bodies she constructs, with the aid of engineers, equipment to
propel a body into the new locale, momentarily. “Once a design is set, I then go into rehearsal to create the new vocabulary that emerges from traveling to these new territories, aided by our new machines.” (Streb 2010: 83)

Streb’s choice of language throughout her work with her dancers – Action Heroes, as she calls them, impacts significantly upon the approach taken by the dancers. Her technique of Pop Action, perfected over many years of her own practice, had its beginnings not on sprung dance floors or even acromats but rather on wood or concrete. The Pop Action technique grounds the experiments of what is possible in terms of the new movement vocabulary. The technique establishes the practice of falling and landing on any surface of the body (barring the head of course). Pop Action in tandem with Action Machines provides the basis for dancers to fly – however briefly. And, given the brevity of this flight, the first principle of the body is how to fall. Action Heroes must be able to fall in order to fly.

The training of Pop Action aims at training how to fall. The training aims to construct bodies that are resilient, open, sensitive, dynamic and quick, adaptable to new situations and aware of themselves in relation to space, place, gravity, objects and other dancers. By doing so, the dancers (or Action Heroes) are prepared to work with equipment, in relation to external frameworks that the action machines literally construct as environments that propose new physical realities in new places of space. Streb writes, “The machines we invent do not just serve to get us into certain places. The new ‘spots’ in space that we explore are also laden with forces (and place us in conditions which produce forces) that we can harness.” (Streb 2010: 84)

The methods that STREB Extreme Action Company use in the studio incorporate and harness invisible forces; let your face make any expression it feels, especially reflecting the physical experience you are now having; get off your feet to change your base of support; develop impact technique; take the hit; question the hegemony of the floor; make action episodic and abrupt not durational and smooth; name a move you are willing to do; name an impossible move and do it; create real turbulence; eliminate transitions; ask what is the content of action, then answer it; go and remain outside your comfort zone; break the fourth wall with substance; abandon a skeletal method for initiating movement; develop a nomenclature for action rhythms; occupy vertical space; occupy vertical surfaces; develop human flight; show the effect of action on substance, i.e., dive through glass; do not camouflage the impact of gravity; stop being careful; agree to get hurt; invite danger; defy transitions; explode. (Streb 2010 133 – 134)

The methods offer strategies for and provocations to take on physical puzzles such as how to “occupy vertical space” or “invite danger”. What does this mean? And, how to physically take on the proposition and re-engage each time with the proposition? In STREB’s work part of the drama is in witnessing humans wrestle with challenging concepts, take risks, and cope with the very real potential of danger. The ‘drama’ as such is not contrived or virtual, but actual. If the pendulum swing requires a cement block for the weight and timing of the swing then it is a cement block and not a foam block.
In considering what Motor Learning calls the "constraints-led" approach in relation to Streb's studio-based process, I thought about several aspects of the process within STREB's rehearsals at SLAM. I think the concept of opening the studio rehearsal process within Streb’s approach is something like the ideas contained within environmental conditions of motor learning. What I observed makes me think about the impact of the work and the added energy one receives from an audience—this is a condition that is difficult to replicate within a rehearsal environment of closed doors with a choreographer and perhaps the performers not involved in a particular section of a dance watching. The conditions of performance in this context seems somewhat necessary for generating additional energy and the psychological conditioning to keep taking the hit - to go again and to do so without reserving your energy. Streb refers to the ideology of the energy necessary for a movement being the maximum output for each movement. (Streb 2010) Therefore introducing an audience, with the energy they put back into the space, by practicing in conditions akin to a performance would seem to be a useful strategy for practicing extreme action moves.

The constraints that I mention above create conditions for the dancers to construct moments for themselves in the guise of what Streb calls an Action Hero. Action Hero moments come in circumstances when the dancers execute moves perhaps to escape a potentially dangerous situation. These are ‘perfect moves’—moves that occur through the confluence of situation and the exactitude of movement in response, no more or less: a perfect move.

STREB dancers rely not only on their own sense of internal timing but also upon an ongoing exchange of calls (a call and response system) between each other as signals/cues for movement. This means that on top of performing gruelling choreography, taking multiple hits/impacts after attempting to fly but failing, they also need to be able to sustain their breath to call to one another. The calls are functional. They say the move, to go. Right from the opening call “Dancers Ready”, they are engaged with one another, listening and attentive, not for a musical cue, but for their dance partners whose bodies set the timing for action. In Streb’s view, movement events follow (or need to follow) a very different temporal structure than aural ones (i.e., music events). The timing or pacing of movement events depends on entirely different factors: the mechanical measurement of the legs, arms, torso, neck, hips, feet, shoulders, ankles, and knees; the alchemetic processes of the neurological systems of the human being; the size of your heart; your lung capacity; the flexibility of your tendons, ligaments, and muscles; the size of your quads, glutes, and calves and their capacity for growth. (Streb 2010: 120)

‘Walk and Talk’ is a strategy employed by the dancers throughout the rehearsal process. Walk and Talk is fairly straightforward in the context of STREB. It creates space for the processing of cues within the high speed-energy ‘adrenalized’ dance. What others may refer to as ‘marking’ the STREB dancers refer to as the Walk and Talk. Verbal cues, specific physical actions—a hand on the equipment for instance,

---

10 SLAM is the Streb Lab for Action Mechanics, home of the STREB Extreme Action Company, rehearsal and performance space, and training centre for the wider community.
the positions of other dancers in space—are all systematically walked and talked within the performance space in their exact context. In this space the words used to cue one another are also made explicit so that once running there is no room for variation that may result in misinterpretation and potential injury. The names of moves or sequences to be performed all have their own place in space, as well as a call and possible response. Watching the newest STREB dancer, learn when to call “legs” for a move in which she dives at the wall where two dancers are hanging with their backs to her and they have to catch her with their legs, is watching someone have to overcome their intuition. She would continuously call “legs” while she was airborne and on her way to the wall. This was too late for the dancers to receive her call/cue and make their legs available to catch her. She had to train her call on her take-off foot.¹¹

The technologies within the space in terms of equipment—the Action Machines—all create new conditions for movement and therefore new environments. In their work with the Action Machines the dancers must adapt to the new environment that they construct. They must find methods to not only work with, but also to test the possibilities for action that these pieces create opportunities for. The Action Machines as external framework lead towards processes of ‘ex-quiry’ proposing “certain Newtonian demands” embedded within enquiries such as:

develop a nomenclature for action rhythms and felt timing systems; timing is emergent, not a decision; nounize action instead of the body; reimagine the design of action rooms; ask how high you can fall from; believe in human flight; pop the muscles; redefine grace for action; investigate the iambic pentameter for movement; know that music is the true enemy of dance; rob the floor of its hegemony; isolate the direction of up; have more than one body in the same space at the same time; occupy un-habitual places in space; get out of cliché-ridden spaces; be out of control when moving; make action the subject, not the body; fly. (Streb 2010: 134)

For the STREB dancers, environments are versions of technological environments, even though they are not necessarily digitally enabled technological systems such as Cunningham’s work with computer software LifeForms. Streb’s environments: mats, revolving floors, truss, harnesses, trampolines, and specifically designed and engineered Action Machines are all viewable within the understanding of a technological environment and the impact upon the dancers’ bodies is apparent. Technology such as a crane truss that allows for the truss that the dancers jump off at various heights to be taken up and down with ease, is one such example of technology working within the dancers’ environment. The crane truss enables the dancers to work on falling from various heights on to the mats below. By gradually being able to increase the height of the truss the dancers are able to work on their flight and landings. They can take their time in acclimatising themselves to greater heights and greater impact. They can build a repertoire of different in-flight moves and practice landing on different surfaces of their body other than their feet.

¹¹ Notes from observing Open Rehearsal at Streb Lab for Action Mechanics, September 2015.
The timing of the equipment/machines can also be viewed in relation to the timing of the performers who at times also function as equipment for their fellow dancers. Getting the timing right when you do not have a visual reference of your dance partner (human or machine) one must rely on other senses. In many instances the dancers rely on the calling system to relay their messages to each other and at other times they may be reliant on more haptic information as they work with a specific piece of equipment or action machine. Vibrations and sounds of bodies on mats or the sounds of the equipment can all provide vital feedback to the dancers.

ACTIONING A CONCLUSION

Action machines in design, construction and application in studio-based dance processes afford dancers and choreographers potentially new embodied experiences. The design of the system can afford choreographers the means to transmit their embodied knowledge and ways of thinking in action to dancers. Systems invite and elicit action. They can challenge, demand, provoke, nurture and inspire dancer’s movement. And, they can shape, inform and alter a dancer’s perception, moving identity, and body. Action machines provide a studio-based method for the investigation and creation of dance.
PHYSICAL THINKING PROTOTYPES

Physical Thinking Prototypes refers to the constellation of four projects I have constructed throughout my PhD candidature—WORK, meta, Project Poser, and META. Each demonstrates a different approach to the concept of action machines and ‘ex-quiry’. Over the course of my research and throughout the developments of each project my thinking about what action machines might be, how they might operate, and how the process of ‘ex-quiry’ is represented across multiple platforms has all developed. I have documented traces of physical thinking in written studio notes and edited video. In addition, I have entwined my own thinking contained in the studio notes and edited video with external sources informing my studio-based processes. In what follows below I am attempting to find ways of representing the thinking that has taken place in the studio, and in the performance of the action machines. I am attempting to construct a formulation of fragments from my studio-based processes in a blog-like format somewhat akin to the entries of the projects on my website. In what follows below I am attempting to find ways of representing the thinking that has taken place in the studio, and in the performance of the action machines. I am attempting to construct a formulation of fragments from my studio-based processes in a blog-like format somewhat akin to the entries of the projects on my website. I am interested in representing my notebooks and blog posts on the pages of my exegesis document. I want to attempt to sustain the intention to document studio-based processes in a way that keeps the thinking active and alive—in process, rather than a complete reflection, synthesized and hewn into a completely structured form. My ideas are mobile and not linear. They require a different representation.

In Meg Stuart and Jeroen Peeters’ book about the choreographic work of Stuart, Are we here yet?, Stuart and Peeters represent a context for writing about practice in which the reader can enter at any point. (Stuart and Peeters 2010) Are we here yet? does not have a table of contents and invites the reader to ‘walk through’ the material—images, notes, exercises, and writings in your own fashion. I take their work as a jumping-off point for my attempt as it unravels below in the sections: WORK, meta, Project Poser, and META, as I attempt to mobilise my conceptual thinking and demonstrate how a constellation of questions, ideas, provocations and physical experiments created a series of Physical Thinking Prototypes. Are we here yet? like my chapter Physical Thinking Prototypes seeks to locate you, the reader, inside in the studio-based process as much as within the work that these processes may produce. The studio-based processes, as represented differ from the choreographic performance work that emerges from them, but are no less significant than the final form of the work. Here, I want to demonstrate the ‘meta’ material, the work-of-the-work, as it lives within me and is activated by dancing in the studio. This is the work of a dancer-choreographer.

I preface the dancer here as it is only through the act of dancing that the thinking of the work emerges (for me). Surfacing in action, my thinking is borne of movement—of puzzling through physical questions. The action of dancing reveals further questions and new puzzles. Without dancing, questions and puzzles are just words, ideas, and concepts all rendered dead on the page. Mobility, mobilising concepts in, through and within the body brings forth potential for physical thinking. Through

---

12 See [http://stephhutchison.com/#!projects/c17y3](http://stephhutchison.com/#!projects/c17y3)
proposing these four prototypes I seek to propose just a few possibilities for how the work of dancers in studio-based processes with external frameworks gives rise to physical thinking and the possibility of constructing new bodies in dance. I feel that each new project within my contemporary dance practice provides an opportunity to construct a new body. The ways in which my thinking is directed by the frameworks and what this means for the ways in which I organize my body in time and space, and the ways in which my muscles are recruited for action are all affected by the framework—the rules of the game, the system.

Traces, residues from previous processes, always inform the strategies I deploy and the kinds of physical thinking available to me as a dancer. Some of my experience is as a dancer for other choreographers or within systems constructed by others. However, much of my history is as a solo dancer-choreographer and informed by my trainings in various dance techniques, some circus, sports, and everyday life. For each dancer these will be different and in writing from the perspective of doing, the perspective of the dancer, I hope we will begin to develop a richer understanding of studio-based processes and the potential for action in dance. The voice of the dancer within studio-based processes offers us the opportunity to understand how thinking about movement affects dancers’ bodies and to propose further strategies that give rise not only to infinite potential action but also to the role of the dancer as a co-creator in contemporary dance practice and performance.

**WORK**

*WORK* was an existing solo performance, which I decided to subject to a process of ‘thinking prototyping’. *WORK* was developed (2012) and recreated for performance at Dancehouse (November 2013). I wanted to use the concept of motor learning, with its focus on constraints, as a way to propose a new strategy to view and sample ‘moves’ via the construction of an independent digital organising system. The concept was to generate a performance from the studio-based processes that had been utilised to create and perform endurance dance works. For this experiment I wanted to make the division between practices of the body invisible and to merge a new body through sampled movement and sequencing. However, this was not to be due to the complexity and labour of motion capture and programming of a new sampling system required. So I deconstructed *WORK* into a series of principles and tasks with various equipment all enlisted to exploit the concept of the labour of my body in studio-based processes. These became a series of task-based constraints that operated throughout the performance to produce different effects of states of labour and endurance.

I make reference to Ironman, Julie Moss, within my statement about *WORK*. When I created the original *WORK*, I was particularly interested in the collaborative and artistic potential of dance, circus arts, sports and improvisation practices available to me in the moment of performance, and what that might mean for a solo dancing body. I was interested in the ways I felt like my body was shifting gears between movement practices, the types of movements performed and the ways in which my muscles would need to be activated to produce particular kinds of movements. Ironman as an extreme endurance event involving multiple disciplines and practices
of the body, provided me with a framework for a contemporary dance performance intertwining different practices of the body that have little and everything common.

Subjecting this work to a constraints-led approach to motor learning involved shifting my focus towards the function of the equipment in the work and specifically to the effect the equipment pieces had upon my body and to the possibilities/potentialities these effects afforded as stimuli beyond my own physical body. I took, as a set of questions:

What are the limits of the body? At what point is it necessary, or do you stop or give up? What is possible? How many potential routes for action are available to me, and how do I make choices about them? How can I create conditions to test and challenge my choices to generate new potential pathways, new possibilities? How does the equipment itself juxtapose or transpose some of the condition or state of my body? How might the textural qualities of my muscles, bodily sounds, and fatigue all be realised in objects/equipment within the performance?

Thinking about “constraints” in the development and performance of WORK I decided to:

- Consider the environment—the equipment, costumes, floor and space as possible constraints, applying different approaches to each and testing what is possible both within their function or traditional use and their potential as referential objects to construct meaning
- Create vignettes of exhaustion of all parts of the body and by different types of action/ action scenarios
- Deconstruct performance through training
- Construct and deconstruct concepts of movement, training, the body, and exhaustion repeatedly

Ironman Julie Moss provides a fantastic account of what happened to her body while running in her first ever Ironman without ever having completed the total distance before. Moss describes listening to the voice inside her that was telling her to get up and keep going, keep moving forward. The image of the baby giraffe getting on to its feet, trying to walk, Moss describes as the finding of a methodology to bring herself back to her feet, to get herself over that line. (Moss 2010)

From a dance performance perspective, I was not interested in pushing my body as far as Moss (however unintended as Moss was). What I love about dance is working in the studio every day. Working exceptionally hard, challenging myself—physically, mentally, creatively. But, I have to be able to get up the next day and work again. So, how to express some of the extreme experiences felt within the body during durational work outside of the body became important. At times I made the effort apparent and not actual—the labour effect rather than reality. Carrying the big red mat on my back is a moment where the scale and anticipated weight based on its mass offers the effect of extreme labour even though in relation to other tasks throughout the solo this is of relative ease. Well, at least until I had to slow down my
spinning with big red on my back—the additional force and the weight of the big red in motion was indeed hard work.

Thinking about how function—the function of shifting equipment between spaces or from one place to another, the Velcro that fastens mats to one another provided me with mechanics to articulate bodily states and conditions in which I found myself. I was looking to exploit the labour of studio-based practice, rather than to create a seamless event in which everything is in its place and ready for all manner of action to unfold without need or want of transitions. The transition is the dance of WORK. It is the in-between, the threshold, cut, gap, groove between different modes of effort, defined by different pieces of equipment. Here in the transition my body has a certain of matter-of-fact-ness. It wears the events passed, the function of shifting gears and the future-ing of what might ensue. My body constructs itself in the fashion it finds itself without additional layers. Similarly, by attending to each individual task within the score of WORK I was directed by my attention to the task and constructed physically in relation to the specific task.

I played with the absurdity of attempting to find flight and fluidity of movement within my body when bound was what I felt by concepts, practice, physicality, and muscular fatigue. Toying with a dress covered in ruffles I constructed a version of the deadly training drill the burpee and repeated it in loops with slight variation of the burpee until I nearly did “bur-puke”. The dress affords softness, lightness, breathiness, flights in its movement, fleetingly. It too is an acrobat. However, the irony of what was required to physically create the flight of the dress was that often gaining a small reward (flight) required much greater output of my own effort versus the effect of dress flight.

Tearing the Velcro provides an audible experience of how I am experiencing my muscles, especially my quads. There’s grit in the movement and a gnarly-ness within concepts, tasks, sounds including rasping breath revealing rather than concealing the effort within the work. In dance we spend so much time attempting to conceal the work, the labour. However, there is no denying the extremely physical, high risk, incredible athleticism of dancers. Like Streb, I value this aspect of dance and am happy to both demonstrate the work as it is and to amplify the work of the body, my body, in various ways. I accept that the lack of music in WORK requires an additional intensity of attention from an audience (during the performance I had a sense of the audience hovering, suspended, their breath held and propelling their hovered presences into the space below that I occupied)—without a familiar structure and ease to sink within while watching the work from the comfort of their chair. In WORK, each rasp of breath and thud of my body on various surfaces is audible and not washed out by music. This affords me more dramatic effect without quite so much of the impact.

---

13 A burpee is a physical exercise consisting on a squat, jump legs back to a front support position, push up, jump feet back in to a squat, jump up with arms in the air and return to squat – repeat all. This was developed in the 1930s by American physiologist Royal H. Burpee.
Re-working WORK through the lens of physical constraints functioned as a bridging process between my previous work (WORK was part of my Master of Arts research) and the new spaces in which I wanted to begin to operate. The process of re-entering WORK enabled my understanding of constraints to grow. From my practice and performance I began to understand more about constraints, affects on the body, and how I might develop dynamical systems or find them to enquire more about the potential for action of the human body. This set the scene for the next physical prototype—meta.

meta

meta, is a short solo investigation into the experience of dancing with John McCormick’s Artificial Intelligence Agent. John’s choreographic agent and I undertook training, rehearsal and performance together. For me, meta began as I noticed the presence of the Agent within my solo practice in a neutral studio space. I wanted to discover more about the quality emerging in my movement, the developing buoyancy and attention to articulation and shapes of movement that were emerging from our shared dance. I wrote NOTES FOR JOHN in response—they are the jumping off point for my physical investigation and the development of scores (both physical and a sound score) derived from the experience and traces of teaching and performing dances with John’s AI Agent.14

As a dancer-choreographer I had been and continue to be working on multiple projects at once and there is spill or overlap that inevitably happens between processes, practice and the kind of movement concerns that arrive from out of the different projects within my body. Entangled with the development of meta and throughout the collaboration with John McCormick are WORK and one month spent training in both Pop Action and Gaga. For each I was interested in the approaches to dance practice—principles of the body and the ways in which my thinking-moving-thinking loops functioned within these various practices and studio-based processes. I was curious as to whether there might be any relationship between them? I began to question the notion that contemporary dance is a process of ‘inquiry’—taking place inside the body of the dancer. That just maybe this was not quite what I was experiencing and working on in any of these practices. Rather, what I experienced was working on/within is an external framework. During this time, I began to describe my experience as a process of ‘ex-quiry’—meta, became the first articulation of this studio-based process as a dancer-choreographer. As a dancer-choreographer my practice is directed by the external framework I design, and the movement enquiry I undertake within the framework shapes the choreography.

Returning to the concept of sampling that I discussed in relation to music sampling, my understanding as a contemporary dancer is one in which I consider my body in action as a performance of samples. In music these samples are from other pre-existing songs or sounds collected from environments, instrument or vocal loops assembled through a form of cut-and-paste, collage method. Similarly, in

14 See Appendix NOTES FOR JOHN and text2speechdocs
contemporary practice we are assembling fragments that have different histories, different cultures and practices into a singular work and indeed into singular bodies who synthesise them in to action. This new work also can be viewed and deconstructed in ways that allow for influences to surface. For cuts and grooves to create space for potential action to arise and this new work to cultivate a new body in action through the choices made and its new assembly of the myriad of possibilities.

Developing scores from the experience of dancing duets with an AI Agent and my notes for John provided an external framework to riff-off. This idea of riffing-off, jumping in-between the grooves and finding what else might be there is informed strongly by the concept of sampling within my research. For meta the process of sampling began physically before writing about the experience. The recognition of the Agent’s presence within my solo studio-based practice—away from the motion capture system, projection screen, computers and avatars—in a white studio on my own and often without music, I began to find a quality of movement that was derived from my engagement with the Agent in our duet Recognition. The quality that this particular duet produced in my body returned and returned in various guises and my attention began to slip into the groove between my own practice and the trace of our shared dance. I chose to investigate what my experience with the Agent was and how the exchange between John, Agent and myself, had developed my body and ways of thinking-in-action that might inform my own work away from the immediate collaborative environment we shared.

My choice to work with a computer-generated voice as an accompanying sound score for the movement enabled me to create a conversation around the experience I had with the Agent but flipped it into an imagined voice for the Agent to discuss its’ experience. Text to speech functionality on my laptop allowed for me to easily (well no less laboriously) develop pieces of spoken text that could be sampled into a sound score. After taking the text from a typed form and playing with its tempo and tone I could create a track that would be exported to iTunes and from there dragged in to Garage Band. Once in Garage Band I could cut and paste samples of whole words or parts of words to develop different rhythms and textures within the sound. Layering of sounds and also the pacing of longer passages of spoken text developed a presence for what I felt was the trace of the Agent within my body, my movement and the space I still felt we shared.

The glitch effect that can be created through sampling parts of spoken text and looping procedures for me is a way to play with and in some respects exploit some of

15 Recognition is a duet between McCormick’s AI agent and myself. The agent has learnt to dance via my engagement with its’ physical presence—the animated form constructed of five spheres attached to hands, feet and head of a computer generated skeleton. The spheres are skinned in an image of John and my irises. When I am dancing with the agent it reveals itself in John’s iris and when performing on its own it assumes my identity and reveals itself in my iris. The spherical structures also known as blobs have buoyancy to them and move in relation to my movement as tracked by the Kinect. Due to the nature of the Kinect technology as a less robust form of motion tracking system the effect also often contains glitches where the tracking system is attempting to recognise the body.
the technical glitches I experienced in studio-based processes with motion capture and an artificially intelligent choreographic agent. Glitches are part and parcel in my experience of working with technology but what you do with a glitch is up to you. For me, a glitch is a gift freshly packaged with new potential. Each glitch is usually different and its unpredictability (mostly) creates another cut that can provide a break from what is known and the opportunity to find something new. Glitches have given me popping movement, breaks within movement, dividing the whole and creating loops of smaller parts of a whole movement.

Morphologies of the Agent’s visual presence provide different textures and qualities to work with as another form of external framework. For me the quality of the ‘blobs’ in Recognition were the most salient example of how a morphology of the Agent (as external framework) affected my own physicality. Dancing with the Agent I discovered a buoyancy to my own movement as I engaged with the Agent. Our process of exchange via the Kinect and projected image generated a new kind of discovery and problem solving. It directed my attention to forming shapes/structures from the blobs a bit like watching cloud formations. I played with frequency, shifting between moving rapidly and sculpting forms to be held over extended durations. Opportunities to test and exploit its’ potential to hold its’ form and move in relation to its’ current form/shape provided opportunities to test buoyancy and also to elicit glitches that I could work in relation to—either exploiting the glitch and limitations further or working to correct—to restore and nurture the Agent’s morphology.

Project Poser

Having understood the power of digital ‘external frameworks’ to create extreme puzzles for the body, I then moved to an animation technique to begin to develop my own set of generative ‘puzzles’. The animation software 'Poser' enabled me to quickly propose new physical puzzles to solve, and required a new process of body-based enquiry in relation to the figures morphology. Used by choreographers such as Wayne McGregor, among others, 'Poser' enables the creation of the ‘impossible’ task—one of my favourite things when considering a new process. However, in contrast to conceptual tasks such as those that might have been presented in a Robert Dunn composition class, or equipment based tasks that frame interaction between dancer and external object, animation tasks created using Poser, like McCormick’s AI software agent, are presented in moving, humanoid form. The avatar moves as a human, and the communication is therefore ‘body-to-body’ at least in terms of the structural organisation of joint movement, if not in the haptic sense of touch and weight. I created a series of short video files of the moving animated body to use as a stimulus for a new studio-based process—the act of creating the short animations and re-engagement with the video files provided me with another form of action machine. The tools within the software for directing the humanoid model become some of my tools and strategies for directing my own body. The software tools (including: rotate, twist, translate/pull, translate – in/out, scale, taper, clean break, colour, grouping tool, morphing tool, and direct manipulation) I came to see as potential instructions, strategies for manipulating movement and scores for movement enquiry.
I originally chose 'Poser' after being introduced to it during Kim Vincs' project, *The Crack Up* at Deakin Motion.lab. Kim prepared a series of animated files using Poser and asked (us) the dancers to create movement phrases that approximated what were physically impossible movement sequences. The sequences, for example, included limbs seemingly moving through torsos and flying and twisting sequences that are biologically impossible. What I liked about the files that Kim gave us was the ability to interpret movement with an ideology of being physically impossible to replicate. I then also created my own studio-based process with a humanoid form with no joint rotation limits, no sense of gravity, movement initiated from the hips/centred from the hips, and no sense of frame meaning that the figure can therefore move through the floor or fly off screen. I am not trained in animation, however, I was able to follow a simple idea of opening up the program, setting the number of frames to an arbitrary number, manipulating the model using the tools provided and at randomly clicked upon frames throughout the timeline, and finally creating a video file of the movement performance to use. My lack of training in the program was an asset, since it added to the randomisation of the movement sequence, and meant that my existing movement preferences could not dominate the outputs, since I did not have the necessary control of the medium to effect this.

Another appealing concept is the 30-day free trial available. When considering the application of an external framework within studio-based dance practice it seems relevant that ubiquitous technologies and open source software or systems, can provide a dancer with a means to experiment with possibilities of human movement through augmenting their own embodied practice with the aid of a freely available digital system. Or at least freely available if you stick to the trial limits. This in itself acts as another constraint.

Finding that my experiments on the soles of my feet were limited—limited because I sought more from my investigation in relation to the figure’s lack of gravity—I decided to move towards the tissu or aerial silk as a means to drive movement from other bases of support—neck, quad/hamstring, arm pits, front and side hips, lower back with legs hidden in tissu, and sitting in a kind of harness. These new bases of support provided alternatives and allowed me to move freely with the idea of moving from the hips as a centre of mass. However, while freeing-up my lower body, my upper body became less mobile as it took over as a means of support and facilitated my movement on the tissu in new ways. Concepts such as "finding the wildness" and "wild head and arms" at the same time as maintaining the freedom of the lower body became ideals of practice.

I continued all the while to include within my studio-based process the use of the software Poser as a means to re-calibrate, immerse and re-inspire my physical experiments. Generating video files that sampled my use of the software and offered a moving partner (on loop) where necessary to provide further movement stimulus. Very early in the project I recognised that attempts to maintain a closeness to the poser figure’s movement stagnates the process and practice. I choose instead to work
with its movement like a choreographer improvising in front of me and applying the
task of—‘what did you notice?—take that noticing and investigate that’.

The tissu proved to be a plausible solution to accessing movement from my hips. However, the points of contact or rather body parts that became a central weight bearing point posed much the same problem as standing on the soles of your feet—you’re still not in flight nor freely mobile. However, Poser did propose its’ own sense of logic or making sense ad creating sequences of fluid movement from randomly created postures along the timeline. Given that Poser’s logic constructs physically impossible movement for humans it disrupts my own patterns of movement and typical enchainment of movements. Watching the Poser figure move I looked for its’ bodily points of movement initiation and how it diverts from movement to movement. I worked with initiating movement from different points of my body and played with attempting to change or alter the sequence of movement at any point—not necessarily completing the movement I had begun, and also attempting to re-direct the flow of the tissu either while spinning or swinging on the pendulum. And, I continued to always take on Poser’s sense of free-flowing wildness that could initiate movement from seemingly nowhere, shift its’ locale at the blink of an eye, fly, and levitate while wildly rotating and passing body parts through body parts.

META

How might I attempt to construct an installation and performance constellation of the many reference platforms that exist within my research project?

A Piece for Upper Body and Dots, seeks to create a form of external framework/action machine for any body. Taking the classic game Twister as inspiration I sought to offer an experience of working within an action machine for an audience. The developing idea shifted from thinking about creating a large-scale installation of walls and floor covered in dots to the tabletop version. Game play of the original Twister using my colleagues as test cases prior to a showing of studio-based practice proved that the concept was strong in developing an understanding through experience of how one might engage with an external framework and the affect on their bodies and their perspective. However, the floor-based version creates some anxiety and little ease among participants. Thinking about this I changed my scale—downsizing to the circular tabletop. Through the collection of instructions designed to propose movement possibilities for the upper body I was interested in creating a series of tasks for participants that would elicit movement responses, possibly eliciting new movement responses for participants and have the potential to shift their perspectives. I was interested to see if their embodied experience of the task-based performance in a Piece for Upper Body and Dots might carry over into their viewing of the performance META and in some way frame the performance for them.

As with my work, meta, I chose to work with Text-to-Speech to develop an instructional soundscore to define the tasks for participants. Text-to-Speech affords

---

16 See Appendix “INSTRUCTIONSforTwisterSH”
me the ability to generate verbal instructions from my written propositions. It offers a simple solution to creating sound-based systems as prototypes for action machines. In this instance I could develop a series of instructions for a particular point on the upper body, then assign either Left or Right if appropriate, and a colour – this was another form of cut-and-paste arrangement, as was my placement along the timeline and the loops over the course of an hour long track. Although these systems are closed circuits in that they are edited in the software Garage Band and pre-recorded as a sound file, they do lend themselves to interaction and engage new users in a process of exchange with the system.

The television screens provided the opportunity to loop edited video samples of studio-based processes and live performance concepts. While not as refined in terms of content selection and editing, the edited video was able to cover a broad sample of my three-year research project. For both of my earlier physical thinking prototypes (WORK and meta) I did not work with video documentation of studio-based processes and was reliant on the performance footage to demonstrate my ideas. Project Poser, a later physical thinking prototype, proposes edited video as a means to document and articulate the studio-based process. Throughout different experiments in the studio I worked at times with a video camera to document the process and consider methods of capturing experience. I was particularly interested in layering techniques in the concept of both picture-in-picture and also in layering layers of video on top of one another to produce traces of experience/traces of investigations and the ongoing filtering process of many experiences/investigations and layers of movement at once while practicing in the studio.

Also within the installation I offered my website (www.stephhutchison.com) as a searchable platform to engage with the ideas surrounding my research and also other projects and ideas that intersect meta: discourses from dancers inside action machines. As a strategy for thinking through my ideas throughout my research, and as a means of communicating with my supervision team from distances the website serves as a repository of thinking, ideas and concepts. In part the practice of writing and of writing in a form for casual publication of ideas in process the website has aided in further establishing the voice within my text. The inclusion of the website within the installation again seeks to make visible the studio-based processes, enquiry of my body for others. As with the performance of META following the installation the website allows for multiple layers of articulation—video, text, still images and sometimes sound.

META the performance work, seeks to function as a continuum of experience arising from all of the Physical Thinking Prototypes. The choices I made in selecting the materials for the video projected throughout META were made in consideration of my studio-based research to date. I sought to create a constellation of the documented work, the studio-based processes undertaken throughout my research, the concepts I have engaged with, and what might be a way of articulating how I have seen the movement of both myself and of the Poser figures while moving. The process of developing the video took multiple iterations, like the idea of sampling as being akin to working with Lego blocks, I had many of the materials already at hand.
and then had to engage with and find ways of creating from within, between and beyond the materials.

I worked with the video editing program *Premiere Pro* as a relative novice. What I was able to do within the program was to think about the frame and how it might work as dome for the final projected image using the projector and mirrored dome configuration that John McCormick had set-up as an alternative to multiple projectors on different surfaces of the dance studio. I was able to change the size of the videos I already had at hand and layer multiple videos into the same frame at varying angles and placements within space. By layering earlier iterations of studio-based processes and performances into the beginning of the work I was able to set in play the “meta” of *META*.

Later in *META* I developed a sequence from the short poser videos I had made for use in my studio-based process, *Project Poser*. The sequence sought to fill the entire studio with small Poser videos that looped and dropped out, and began to deconstruct—cut into words and some footage of one of my studio-based experiments with Poser. I sought to begin to return to the body, to the technology of the body amidst all the other operating systems affecting my body. The choice I made to colour the Poser videos into a much stronger black and white by heavily increasing the contrast of the video in *Premiere Pro* and the choice to create lines of small frames created a visual link to the work of Muybridge—connecting my earlier thinking surrounding this project into the biomechanics of dance and the potential actions of the human body when tested with extreme propositions for action and the solutions that it may arrive at.

As my work has progressed so to has my use of technology within studio-based processes. *Project Poser* was my first foray into creating my own small animations as movement provocateurs using the software Poser. With this shift I began to think about the ways in which I was seeing movement and the strategies I deployed to attempt to create Poser-esque movement using my own body. I was interested in the frame—in the ways in which the Poser figure moves within a frame and has no real sense of any boundaries to confine its action or limitations/constraints such as gravity acting upon its body, and in the construction processes of creating movement in the software by frames and then replaying sometimes scrubbing through frame-by-frame to illuminate the extreme detail of each motion of the body. Thinking about the frame and flickers of movement I was interested in finely editing my existing Poser sample videos to just grab moments of “interesting” movement suggestions from them.

The use of text in *META* in both the voice and projected within the video were chosen as methods to refer to the referential concepts embedded within my studio-based practice. I chose not to provide a more narrative account as I had with my earlier prototype *meta*, and instead chose to list words as stream of running ideas within my performance. As with *meta* I worked with Text-to-Speech and *Garage Band* to develop the voice of *META*. I also worked with a series of processes to develop the projected video of words. I began by creating a single slide for each word or concept within the software *Photoshop*. I then took these into *Premiere Pro* where I worked
on the timing, layering, location and effect of the words in space and time. Each word went through several iterations of layering, editing, locating. And, after an initial attempt I went back through for another pass to shift (mostly extend) the timing and to reconsider the frame in relation to the dome as opposed to the flat screen and what it might mean to locate the text on the side wall, floor, bottom corner of the back wall, or bend around the walls as opposed to being large and filling the whole space all the time. In part this was for legibility but it also afforded the ability to direct both the audiences and my attention in space through moving (or the movement of) the location of the text or indeed earlier the poser figures or edited video of my earlier Physical Thinking Prototypes.

The choice of additional sound within META is a sampling of some of Ryoji Ikeda’s album *dataplex*. (Ikeda 2005) The tracks: *data.minimax, data.convex, data.multiplex, data.complex, data.hypercomplex, and data.googoplex,* all offer looping soundscapes. They also, if you can hear them (not everyone can), contain high-pitched frequencies that affect the body while listening—all in some way slightly disarming and unsettling to me, but nonetheless providing a physical experience. As with my Text-to-Speech samples, I have taken at times short samples, sometimes a single sound, and created loops with them. Sometimes the loops play into one another, and at others disrupt one another as they are distributed at arbitrarily defined intervals on the timeline.

Both the edited video to be projected and the soundscore existed in sections of ideas. Slowly but surely, the video emerged as the “baseline” for both sound and the eventual dance scores. Taking my timing to edit the sound from the video, and subsequently improvising within my constructed environment of video and sound.

META concludes with the performance of the pangram, “Amazingly few discotheques provide jukeboxes.” The concept was to create some form of structure for the Poser material on the tissu. Like all other work the material has been through extensive improvised experiments in the search for potential action. From these experiments in late 2014 I decided to look for what might be singular movement ideas or concepts and arbitrarily attach them to a letter of the alphabet. After developing the alphabetical sample of movements for Poser on tissu I experimented with the concept of the found structures that pangrams offer. As a sentence they contain every letter of the alphabet and invite the opportunity to create transitions that otherwise do not exist between the letters of the alphabet as discrete samples. These pose physical problems that must be solved in the moment of performance. In the process of performing any given pangram my attention is directed by the score (the sentence), riffing on the movement concept of the letter and finding ways to transition from one concept to another. This is an example of the sampling processes deployed throughout *meta* and takes the forms of collages or a bricolage, cut-and-paste layering of structures, concepts, materials that form new scores for movement experimentation in increasingly complex structures/systems—physical thinking prototypes.

The video documentation of the installation and performance also reflects the cut-and-paste, edited approach. It has been cut together as the performance
documentation was too dark for video and a reshoot was necessary. But it has also been edited together in a way that enables the layers of the work to be brought forward (and, as it just happens provided many sync-ups of movement and edited video in surprisingly connected/related ways, without want or need to reposition either my body in the re-shot footage or the video projection file in any way). I have worked through iterations of the same work, making a video to be projected throughout the performance META, my physical body as a technology in its own right—through, within and upon thinking and action arise, and the live performance work as it was recorded—using the dome projection to create an environment from the edited video and references from my three-years research “meta”.
CONCLUSION

My research begins and returns to my own body as a dancer-choreographer. From the position of dancer-choreographer as researcher I developed the notion of ‘ex-quiry’ being a practice of movement research that takes place between my body and something extrinsic to it. This at first was at odds to my understanding of contemporary dance as a process of ‘inquiry’—taking place within my body. However, as I engaged in other’s studio-based practice, with other’s external frameworks (action machines) and sought to examine my own, the concept began to clearly emerge in body and thought. meta, has developed and sustained an enquiry into the potential of action machines in the developments of dance and dancing bodies. Through an applied (danced) understanding of studio-based processes as forms of external frameworks that direct dancer’s attention in highly nuanced forms, this dialogue and discovery led towards the concept of ‘ex-quiry’.

meta has proposed how different kinds of studio-based practices and processes might function as action machines—eliciting movement responses from dancers in the development of choreographic works, and also in experimentation of new movement possibilities independently or collectively. Throughout my research I developed an understanding of concepts such as constraints and sampling as methods embedded within studio-based practice. Through understanding the principles and applications I have sought to develop a discussion around how constraints and sampling lead towards processes of ‘ex-quiry’.

Through research in both practice and engagement with other forms of documentation of diverse choreographer’s studio-based processes—tasks, procedures, scores, equipment, exercises, choreographic agents, technology, I developed a complex constellation of action machines and ‘ex-quiry’ in dance. Via examples such as Forsythe, Brown, Cunningham and Streb I have sought to demonstrate that the application of my concept of ‘ex-quiry’ and action machines may provide a way to understand how dancing bodies might be constructed in dance. In addition, I propose that action machines might be able to contain all the necessary information of a choreographer’s practice and aesthetic in order to distribute their dance widely, and that engagement with a choreographer’s action machine/s might be able to construct bodies of dancers and elicit potential movement within the vein of the choreographer’s intent.

In seeking the dancer’s experience I have arrived instead at a proposition from a choreographic perspective. I began my exegesis with Banes stating “The ‘tradition of the new’ demands that every dancer be a potential choreographer’, (Banes 1987: 5) and it is perhaps that by understanding the strategies and constraints embedded within action machines that I can understand how attention is directed and in turn the strategies perhaps complimentary, relational, or counter to the strategies and constraints of action machines are deployed by dancers. In considering Banes’ assertion, I find the notion of ‘ex-quiry’ and the engagement with action machines by dancers to amplify the concept that each and every dancer is also a choreographer. It is the dancers who most frequently undertake the physical experiments within new
systems and their movement possibilities that give rise to new choreography. Their bodies, experiences within diverse systems, their on-going practice and histories of practice all offer unique exchanges and potential for action as they embark in new experiments.

From my own Physical Thinking Prototypes I have discovered new strategies for directing studio-based experiments with movement potential. I have imposed constraints and sought new strategies for coping and solving different physical puzzles proposed by my action machines. There is no escaping myself and my experiences leading to any point in time are met with a barrage of experiences and knowledge to draw from. What came before does affect and have some bearing on the present but my experience is that the bearing is not a rigid holding pattern but rather a sampling and gathering of resources to draw upon—draw upon to enhance, alter, extend, challenge, adapt, adopt and exchange within a new environment. At times the construction of my body within an action machine has been small and at other times like with Poser and meta it feels much more monumental. In either case the effect of the constraints, the systems, and my experience gathered from processes of exchange in studio-based practice have constructed my body in unique renderings.

Exactly what kind of body ‘ex-quiry’ might produce and what the effect action machines on dancers’ bodies might be are very much an ongoing project. The sense of myself as a dancer that I experience in practice is one where body and mind coordinate through their entwined engagement with an action machine, rendering them returned whole. Action machines provide the opportunity to direct and redirect my attention, to get out of the way of myself and a desire to create the singular perfect movement. They enable me to get busy with experiencing the potential and the excitement of continuously discovering, uncovering further possibilities of movement and the ability create and traverse new environments (imagined or literally constructed through technology and equipment). Such a practice is not about excess—an excess of movement, time and resources. Rather, the practice of ‘ex-quiry’ and the notion of sampling as a methodology is demanding of great discipline, willingness and openness to discover and unearth the body that emerges at any given moment through practice. My dancing body, like the action machines I play within, is a dynamical system—seemingly it organises itself fleetingly and continually anew in relation to itself and the environment of the studio-based practice or performance.

I feel as though meta is the beginning of a much larger project and within it I have the germs to make a more expansive vision of ‘ex-quiry’, action machines, and the effect that directing dancers’ attention has on their bodies beyond any need of a codified dance technique or tradition. As my research continues beyond this project I seek to bring forth the voice of the dancer and undertake studio-based processes with other dancers to understand the phenomena of directing attention in relation to the construction of dancing bodies. I also look towards what future training of dancers within tertiary institutions might entail. Can the constraints-led approach to motor learning be more fruitfully analysed and assist in the construction of action machines in studio-based dance practice? And, how might action machines contain all the information for a particular way of moving—training bodies through directing
attention, developing principles of the body and aesthetics from engagement with an action machine?
BAINBRIDGE COHEN, Bonnie 1993 Sensing Feeling and Action, Contact Editions, Northampton

Banes, Sally 1987 Terpsichore in Sneakers, Wesleyan University Press, Middletown, Connecticut


Bernstein, Nikolai 1967 The coordination and regulation of movement, Pergamon Press, London


Cunningham, Merce 1991 *Trackers*, New York City Centre, New York


Davids, Keith, Button, Chris, & Bennett, Simon 2008 *Dynamics of skill acquisition: a constraints-led approach*, Champaign, IL, Human Kinetics

de Keersmaeker, Anne Teresa and Cvejic, Bojana 2012, *A choreographer's score: Fase, Rosas danst Rosas, Elena's Aria, Bartôk*, Brussels : Mercatorfonds : Rosas ; New Haven, Conn. ; London : distributed by Yale University Press


Hay, Deborah 2000, My body, the Buddhist, Hanover, NH: University Press of New England, Wesleyan University Press


Huxley, Michael 2015 The Dancer’s World 1920 – 1945, Palgrave Macmillan, UK

Ikeda, Ryoji 2005 dataplex, Raster-Noton, CCI Recordings, Germany


Kozel, Susan 2007 Closer: performance, technologies, phenomenology, Massachusetts Institute of Technology

Laban, Rudolph 1966 Choreutics, Dance Books Ltd., Hampshire, UK

Louppe, Laurence 2010 Poetics of Contemporary Dance, trans. Gardner, Sally, Dance Books Ltd., Alton

Madden, Diane 2015 (public communication) Trisha Brown Dance Company ‘Locus’ Workshop with Diane Madden, Gibney Dance Center, New York, September 2, 9 and 16 2015

Manning, Erin 2009 Relationscapes: art, movement, philosophy, Massachusetts Institute of Technology, Massachusetts

McCormick, John 2014 Responding to human full-body gestures embedded in motion data streams, Ph.D. thesis, School of Communication and Creative Arts, Deakin University

McDonagh, Don 1971, The rise and fall and rise of modern dance, New American Library, Scarborough, New York

McLeod, Kembrew, & DiCola, Peter 2011 Creative license: the law and culture of digital sampling, Durham, Duke University Press

Morris, Robert 2013, ‘Notes on Dance’, in Robert Morris (October Files), Bryan-Wilson, Julia, MIT Press, Cambridge

Moss, Julie 2010 Limits, Abumrad, J. and Krulwich, R., Radiolab, WNYC, New York, iTunes podcast


Nicely, Megan 2005 ‘The Means Wherby’, Performance Research, 10:4

Noland, Carrie. 2009 Coping and Choreography, Embodiment and Performativity, Digital Arts and Culture 2009, Arts Computation Engineering, UC Irvine, University of California

Owen Clark, Jonathan and Ando, Taku 2014 Geometry, embodied cognition and choreographic praxis, International Journal of Performance Arts and Digital Media, 10:2

Paxton, Steve 2008, Material for the spine. [electronic resource]: a movement study, Contredanse


Roche, Jennifer. Multiplicity, Embodiment and the Contemporary Dancer, Palgrave Macmillan, New York, NY; Houndmills, Basingstoke, Hampshire

Salter, Chris 2010 Entangled: technology and the transformation of performance, Massachusetts Institute of Technology, Massachusetts

Shaw, Jeffrey 1999 ‘Editorial’ in William Forsythe, Improvisation Technologies A Tool for the Analytical Dance Eye, eds. Astrid Sommer, ZKM Centre for Art and Media Karlsruhe, Deutsches Tanzarchiv Köln, Hatje Cantz Verlag, Ostfildern

Spittle, 2013 Motor learning and skill acquisition: applications for physical education and sport, South Yarra, Victoria Palgrave Macmillan Australia

Stuart, Meg, & Peeters, Jeroen 2010, Are we here yet?, Dijon, Presses du réel

Sulzman, Mona 1978 Choice/Form in Trisha Brown’s Locus: A View from Inside the Cube, Dance Chronicle, 2:2


Vaughan, David and Harris, Melissa 1997 Merce Cunningham: fifty years, New York, Aperture

Websites:


The Dancer as Agent Collection http://oralsite.be/pages/The_Dancer_As_Agent_Collection (Accessed 22nd October 2014)


