Patterns and Possibilities:  
The Brain, Imagination, and Creative Practice

By

Ron East

A Thesis  
Presented to  
The University of Guelph

In partial fulfilment of requirements  
For the degree of  
Doctor of Philosophy  
In  
The School of English and Theatre Studies

Guelph, Ontario, Canada

© Ronald A. East, December, 2016
ABSTRACT

PATTERNS AND POSSIBILITIES:
THE BRAIN, IMAGINATION,
AND CREATIVE PRACTICE

Ronald Alan East                      Advisor:  
University of Guelph, 2016                    Professor Alan Filewod

This thesis investigates a set of theoretical principles concerning the imagination as cognitive function, based on scientific readings in neuroscience, cognitive science, and neurobiology, as well as experiential observations of creative practice pedagogy drawn from theatre training methods employed to develop the practice of creating original work for the theatre. Key to my investigation is acknowledging that the imagination is a function of the brain. Imaginative brain function is defined as an autonomous systemic, interconnected brain system capable of activating to produce specific outcomes enabling the human organism’s fitness for purpose. I contend that there are two interconnecting facets of imaginative functioning referred to as the biological imagination and the existential imagination, both active on a conscious and non-conscious level. From the first facet I focus on one aspect of biological imagining, which I refer to as the tactile imagination. The tactile imagination is that aspect of imaginative brain function associated with the sense of touch, at all levels of experience, here employed to stimulate the generation of original material for a style of performance known as physical theatre. In addition, I argue that creating, as an outcome, is trainable. While each creation engages in its own specific processes, I contend that there are practices common to creating in
general. In this thesis I demonstrate that, at its source in the imagination as brain function, there may be certain processes common to most creative endeavors. This embodied analysis posits three imaginative processes – the provision of possibilities, the development of associative patterns, and image composition. Specific connections are posited with memory, emotion, and the senses, in support of embodied theatrical composition, involving a three-stage experiential process of identification, transference, and transformation. This embodied creative process, also engages the existential imagination, associated with consciousness and a sense of self. The engagement of the existential imagination in creative practice is initiated by an altered perceptual state, a cognitive reversal in which conscious cognition supports the imaginative process, initiating discovery and invention. I conclude, that there is experiential and scientific evidence to support a dynamic relationship between this three-function imaginative process and my three-stage creative process, opening up opportunities to develop more comprehensive training techniques for creative practice.
Patterns and Possibilities:
The Brain, Imagination, and Creative Practice

Table of Contents:

Introduction

Chapter 1 Introduction and Review

Chapter 2 The Imagination and Creative Practice

Chapter 3 Proprioception, Kinaesthetics and the Tactile Imagination

Chapter 4 Improvisation and the Existential Imagination

Chapter 6 Conclusion

Works Cited

Photo: Neutral Mask
© Ron East, June 2008
I would like to take this opportunity to thank the following: Prof. Alan Filewod, and Prof. Ann Wilson for invaluable assistance in the development and revision of this thesis. In addition I would like to acknowledge Prof. Bruce Barton for his encouragement and guidance during my MA studies and Prof. Pil Hansen for her incisive responses as external advisor to the thesis document. I would like to thank Jacques and Fay Lecoq, as well as Powys Thomas for their guidance and mentorship throughout my career in the theatre. I would like to thank the 800 students I trained for their insight, courage, and generosity of spirit. Most of all I would like to thank my wife Lin Grist for her support, assistance and undying encouragement throughout this adventure.
Patterns and Possibilities:
The Brain, Imagination, and Creative Practice

An Introduction

In this thesis I conduct an analysis of my practice as director of a professional theatre training academy over a thirty year period from 1978 to 2008, to develop a set of principles about the functioning of the imagination in creative practice. During this time I trained over 800 original creator/practitioners from around the world, and my observations come from this source. I also draw upon my training and collaboration, between 1971 and 1990, with Jacques Lecoq, renowned educator, and Director of the Ecole Internationale de Théâtre Jacques Lecoq in Paris, as well as drawing upon observations taken from my own experiences as an actor, creator/performer, and director in the professional theatre, where I created and presented 16 original works between 1976 and 1996.

I first began to work as an actor with professional performers as a member of local community theatre groups engaging seasoned professional actors who had immigrated to Canada after World War II. We were encouraged to seek a life in a theatre which was just emerging as a career possibility in Canada. I attended the newly formed BFA program at the University of Alberta. A number of the instructors in this program had trained in the U.S., including Gordon Peacock, the Director, and had been influenced by the legacy of Constantin Stanislavski, employing methods grounded in the work of Lee Strasberg, Director of the Actors Studio, Uta Hagen co-founder of the HB Studio, and Sanford Meisner, Director of the Neighborhood Playhouse School, all in New York. The focus of the four year program was to train actors in a realistic style of performance for work in the profession. At the end of my first year in 1967, I was offered a position as an actor at the Stratford Festival under the direction of Michael
Langham. This was an ‘apprenticeship’ system so I learned a great deal from interaction with my directors – Michael Langham, John Hirsch, and Jean Gascon, and the senior members of the company, including Christopher Plummer, Bill Hutt, Alan Bates, Tony van Bridge, Powys Thomas, Butch Blake, Jane Casson, Francis Hyland, and many others. I received movement training with Trish Arnold from LAMDA (London Academy of Music and Dramatic Art), combat with Patrick Crean (the fight choreographer for Errol Flynn and Lawrence Olivier), and voice training from Kristin Linklater and David Smuckler. This began my professional career as an actor.

I spent three seasons with the Stratford Festival and the National Arts Centre, interrupted by one season with Theatre Calgary. During this time I was influenced by the young directors program at Stratford, with Paul Thompson, Martin Kinch, and David Barnett, as well as witnessing the work of George Luscombe, Cedric Smith, and John Palmer. This gave me a taste for contemporary and original work. My mentor at this time was Powys Thomas, a senior member of the Stratford acting company, director of the English theatre program at the National Theatre School and heavily influenced by the work of Michel St. Denis from his time at the Old Vic Company in England. It was at this time that I was first introduced to the work of Jacques Lecoq. In 1970 I went to Paris to take a look at the Lecoq School. I enrolled in the Lecoq School in 1971.

In addition to the major influence of Jacques Lecoq, which I will refer to more generally in this thesis, other influences on my work were taken from theatre productions themselves, shows that I witnessed, as well as other theatre ‘philosopher/practitioners’. My original intention was to spend one year in Paris, as I was simultaneously offered a place as an actor with the Royal Shakespeare Company in London.
While I was in Paris I became acquainted directly with the work of Peter Brook and Dario Fo through their collaboration with the Lecoq School, and was introduced through discussion and research with my colleagues, to the work of Jerzy Grotowski, Tadeusz Kantor, and Henrik Tomaszewski. During this time I also took a workshop with actors from the Berliner Ensemble and was introduced to some of the techniques developed from Bertolt Brecht’s work. While I was at Lecoq’s School I was also introduced to the work of Edward Gordon Craig and Antonin Artaud, as influences on Lecoq’s training process.

Other teachers at Lecoq’s School included Monica Pagneaux (movement), Pierre Byland, and Richard Hayes-Marshall (acrobatics), and Lecoq, Byland and Philippe Gaulier (improvisation), each providing their own influence on my work. I was offered a place in the second year, and remained in the program to its completion in 1973. While in Paris I was performing professionally in a variety of short plays by Slawomir Mrozek, Dario Fo, and others, and was introduced to the French style of performing in ‘cabaret’. By the time I completed the Lecoq two-year program, I was performing in and around Paris with an original production, an improvised two-hander, in French, with a colleague from the school – Paul Andre Sagel.

Upon my return to Canada, I began to develop my own work. I operated a children’s theatre company in Stratford, producing two original shows, taught at the Canadian Mime School in Niagara-on-the-Lake, and at McMaster University, where I acquired a taste for teaching, and then went to Toronto to start my own company in 1976. This company was incorporated in 1978 as the Mime Company Unlimited Theatre Foundation, and was quickly followed by the opening of my own theatre school in 1980. During this time I was also teaching at Humber College in the Theatre Department, did a summer workshop in Paris with Lecoq in 1987, and was engaged as choreographer in 1988 for the film of ‘Rosencrantz and Guildenstern
Are Dead’, directed by Tom Stoppard. I also had the opportunity to work with other alumni returning from the Lecoq School, including Barry Karp, Richard Pochinko, Dean Gilmore, Robin Paterson, Wendy Gorling, and Martha Ross, and my production company and school ran uninterrupted until 1989-90 when I took a year off, supported by the Canada Council, to attend Lecoq’s School as an instructor.

I returned to Canada with a new play on Niccolo Machiavelli, produced in Toronto in 1993 and published by the Playwrights Union of Canada, as well as writing my first book on my teaching process “Moving Images”, published by Arts Media, and revised in 2000. In 1998 I closed the production company and moved the school to London England, where it was operated until 2008. I continued some work in Canada as well, notably directing a stage production and children’s T.V. series for Corus Entertainment.

I was principally influenced by two trajectories in the theatre – on the job training and apprenticeship in American-style realistic acting and classical British acting techniques, for a career on stage, in film and T.V.; and a European based ‘popular’ theatre primarily visual and physical, in which I was encouraged to create and produce my own original work. Since I chose the latter, the work of this thesis comes primarily out of this tradition, and forms a foundation for my pedagogical analysis.

I have elected to create and produce my own work. Most of this work was collaborative, based on my direction and choreography, and each piece was an original work. One of the aspects of the work that emerged over time, was the realization that images and ideas came out of intuitive or ‘non-conscious’ processes, and the value and validity to the finished piece was only realized consciously once it had been accomplished.
I have been drawn to theatre pedagogy, and this aspect of my career has been every bit as strong as my career in production. I do not see great artistry in the theatre as a pedagogical ‘mystery’, nor do I see it as a science. Both trajectories of my career have led me to ask how innovation happens in creation and performance.

Finally, my introduction to academic research in neuroscience and cognitive science began with an individual study course at the MA level at the University of Toronto with Bruce Barton. At the PhD level at the University of Guelph, I studied biology with T. Ryan Gregory, as well as Cognition and Memory with Roderick Barron. In addition I also did a research seminar in Neuroscience and Cognitive Science with Lana Trick, and attended weekly presentations by faculty and visiting scientists on new research. Simultaneously, I undertook courses in English and Theatre Studies to complete my PhD requirements. This thesis research brings both parts of my career together – practice and pedagogy.
Chapter 1
Introduction and Review

Purpose

The purpose of this thesis is to conduct an analysis of selected training methods drawn from my practice in the theatre, and to argue, based on this analysis, for the establishment of certain principles concerning the imagination as cognitive function with regards to applications in creative practice. I elicit from this analysis, elements specific to the engagement of the imagination as brain function in the practice of creating, which may have wider applications, both in theatre training practices and in cognitive science. This analysis is based on my training pedagogy, training the creator/performer in the development of original image-based presentations, as well as drawing upon selected cognitive neuroscience research.

Introduction

In this chapter I will conduct a review of selected science texts upon which I have based my understanding of neuronal brain function enquiry. My purpose is to position my enquiry within current research. In addition, I will review theatre and dance texts employing a cognitive interpretation of training methods, in search of parallels to my own practice. I will also conduct a brief enquiry into a philosophical understanding of imagination to position my argument within a modern western tradition of critical thought.

Some of my selected science-based texts are not focused exclusively on the imagination. They have been chosen to provide a contextual overview upon which I have constructed my observations, as well as providing details which I have interpreted, corroborated by additional material. I assert that isolating imaginative brain function is
difficult using current evidence-based technology, especially from a neuroscientific perspective. Therefore a portion of this research employs descriptive methods, or theorizes imaginative function based on analysis of associated outcomes. A good example of this type of reference occurs in Limb and Braun’s fMRI research on jazz improvisation. Their results provided a basis upon which I have theorized imaginative functionality. “… jazz improvisation, as well as many other types of creative activity, have been proposed to take place in an analogously altered state of mind” (5). This proposal, together with other evidence, provided a clue to my eventual understanding of the notion of an altered perceptual state as an initial stage in the creative process. While I acknowledge an evidential selectivity, it is important to acknowledge that it has been necessary, as a study of the imagination as systemic brain function is only at an initial stage in its development.

Attempts to isolate brain function associated with artistic activity are increasing as the technology becomes more portable. However it is still difficult, for example, to unbundle the complex interconnectedness between tactile movement activity and non-conscious imaginative processing. Holographic fMRI will help to fill in some of the gaps. As stated by Jacob and Papo et al: “FH [functional holography] analysis may be regarded as a system-level analysis that produces a complete, holographic, representation of brain activation” (122). Analysis of brain systems is also supported by current work in artificial intelligence modelling of brain activity. This review has acted as an opportunity to question and challenge the observations drawn from my pedagogical experience.

I made my classroom observations about the nature of the imagination prior to undertaking this science-based research, and they came about entirely as a result of my teaching.
In addition, I experienced Lecoq’s pedagogy directly as a student, from 1971 to 1973. I also made periodic visits to his school in Paris, to view public presentations and talk with M. Lecoq personally about his work. I returned to Lecoq’s school in 1987 to undertake an intensive workshop on new work focused on styles of performance entitled Le Jeu a Travers Les Styles (play through style). As a result of this workshop, I returned to the school in Paris in 1989-90 to complete a one-year full-time pedagogical internship on teaching practices, as well as successfully completing the Laboratoire D’Etudes du Mouvement atelier, Lecoq’s design program. Despite the fact that he did not refer to psychological or cognitive contextualization in his pedagogy, his development of the imagination as it relates to creative practice is essential to this study. I was thoroughly immersed in all of his training processes, as well as remaining in touch with his pedagogical trajectory over a twenty year period. My own pedagogy, practiced concurrently over a thirty year period, started in 1978.

Observations of my practice were gathered, employing written notes, while training my students as they undertook exercises and improvisations designed specifically to engage the imagination in creating original material for an image-based version of theatrical presentation. As well I conducted regular feedback discussions with these participants on the specifics of their work. I became more and more engaged at this time in how the imagination functioned, as a means to make my teaching more relevant and productive, and to understand some of the principles involved.

Descriptive research on individuals with specialized brain conditions, or specific behavioral patterns, studied while undertaking set tasks, formed a parallel research avenue in

---

1 I have a series of four edited video presentations on my classroom work with the neutral mask which contains actual discussion and feedback with my students. This is available as a set through Contemporary Arts Media Inc.
cognitive science in concert with an increased dependence on evidence-based analysis employing fMRI and other technologies. Curiously enough, a new study of brain function in which the individual is asked to simply rest and be ‘unfocused’, referred to as being in a default mode, results in a substantial increase in brain activity. Callard and Margulies disclose in *The Subject at Rest: Novel Conceptualizations of Self and Brain from Cognitive Neuroscience’s Study of the ‘Resting State’* that: “…the resting brain is now characterized by ceaseless activity, exertion, industriousness and movement” (15). What specific brain activity, unrelated to the exterior environment (the traditional purview of the imagination), is being undertaken by this newly discovered default state network, remains unresolved. This may advance research on an aspect of imaginative function in the future.

To combine these two avenues of analysis, I relate the imaginative function to a specific task – creating material for a type of theatre I refer to as ‘physical theatre’. It is image based, instead of being based on a written performance text, allowing the focus of the presentation to remain primarily on visual and choreographic performance. In this context, physical theatre may be described as having certain individual characteristics, while also remaining allied to many theatrical styles, including comedic performance, clown, tragedy, satire, and melodrama. This type of training is particularly conducive, in my view, to an analysis of imaginative function. It is useful, as it is not anchored in language, or one cultural tradition, so it retains an imaginative and metaphorical flexibility and immediacy in concert with a multi-cultural and multi-lingual student clientele. In addition, developing visual metaphor and choreographic play is usually quicker, and is suitable to be undertaken in groups.

It is important to distinguish between brain function and cognitive and behavioral outcomes resulting from brain function – between imagining and creating. By taking the insight
derived from my science-based reading on imaginative brain function and relating it to my pedagogical outcomes, I have constructed an argument about the nature of the imagination in creative practice. I accomplished this by reflecting on ways that this training methodology has been developed to stimulate the creating of new material for presentation – from inventive improvised street performance to technically complex productions in a theatrical setting.

The scientific reading material is focused primarily upon a biologically based analysis of brain function as presented by Damasio, Le Doux, Changeux, Llinas and others, together with theories of consciousness, as put forth by Modell, Byrne, Kosslyn, Damasio and others. These selections posit a declared bias emphasizing brain function as an embodied process, and it draws freely on both neuroscience, cognitive science, psychology, biological, and philosophical sources. I do not deal with a theory of consciousness in a global sense, but instead confine my enquiry to a study of the imagination associated with the practice of creating. This was supplemented by additional material in both book and peer-reviewed article form. I took aspects of parallel but unrelated cognitive and neuroscience material, such as research on false memory syndrome and PTSD (post-traumatic stress disorder), and extracted from them observations which may be relevant to imaginative brain function. This involved a level of interpretation.

Science Review

The nature of these texts usually consists of a compilation of associated research material by the author/authors together with relevant annotated research to present a theory of brain

---

2 Damasio, as a neurobiologist has conducted most of his research employing a biological base, but has also theorized consciousness in his latest book, Self Comes to Mind.

3 While conducting this reading review, I simultaneously enrolled in post-graduate philosophy of biology, cognitive science, and neuroscience classes, as well as attending weekly presentations by invited scientists concerning their current research in a variety of neuroscience and cognitive science research areas.
function, or an aspect of brain function based on analysis of the neuronal electro-magnetic system. One of the first texts I encountered, while researching the senses and their relation to imaginative functioning, as part of my enquiry, was a study of sight by Stephen Kosslyn, in his book *Image and Brain: The Resolution of the Imagery Debate*, published in 1994. The text is a compilation of descriptive research findings, together with critique, commentary and historical contextualization. In it he states that: “This book not only develops a theory of what visual mental imagery is and how it is related to visual perception, but it also explains how this theory developed” (Preface). I gained a great deal of understanding about the nature of sight, and especially the connection between visualization and perception from this work, and I began to theorize that perhaps there is a direct relationship between the senses and the imagination.

It also helped me to appreciate some of the neuroscience methodologies being employed at that time. His accounts of his own experiments allude to the influence of computer imaging, as well as scanning and photographic technology, all current technologies in the 1980’s, to assist, by analogy, in building an understanding of visual image processing. This was supplemented by classroom readings, as well as research presentations.⁴

The book also reveals the difficulties in isolating specific brain function, before the advent of fMRI technology (first appearing in 1992). Much of the research was carried out with patients who had specific lesions caused by brain damage. Various tests were developed for the brain-damaged individuals and these were observed and then interpreted. There was an exchange

---

between researchers as well concerning observations and outcomes, and this debate forms a principal theme of this text. This characterized much of the neuroscience research undertaken at that time, and relates in some ways, to my own methods of critical observation.

For example, Kosslyn worked with individuals with agnosia, a condition in which the person can see an object (visualize it) but cannot identify it (perceive it). This permitted a study of the relationship between visualization, which is largely non-conscious and perception, which is conscious. By observing these individuals, conclusions could be drawn about visualization to perception processes in general, as well as theorizing about the visual cortex and specific related brain activity. Kosslyn was useful precisely because he combined theoretical developments with practical research experience, enabling me, as an arts-based researcher to appreciate and make use of this introduction to the scientific method in practice, as preparation for my study, along with my philosophical readings of Husserl and Heidegger on the nature of the scientific method.

Kosslyn’s analysis of visual perception and visual representation reveal another facet of visualization, engaging the imagination – especially in visual transformation situations, an anticipatory process:

The instructions for the shape-shift subsystem often come from motor programming subsystems; this process prepares one to encode the input that results from an action. In some cases one may actually imagine carrying out a movement in order to transform an imagined object… one may program the relevant movement and imagine performing that action… Such motor-initiated processing causes image transformations to occur in small increments. (387)

This research provides some support for my theoretical considerations concerning visualization and perception, initiating further enquiry.
One avenue I pursued was the speed of the visual system. We perceive at a rate of about 270 milliseconds from light striking the retina to visual recognition: “This 250 – 290 millisecond limit is now regarded as a reference when discussing the speed of the visual system and has been useful in attempts to identify the brain mechanisms underlying visual processes at the superordinate level” (Barragan-Jason et al. 1). At medium efficiency the brain’s beta waves of electro-magnetic energy operate on average at between 40 and 150 cycles per second:

In a study emphasizing either semantic, phonological or purely visual analysis of words and letter strings, HFA [high frequency activity] between 40Hz [hertz.
Note: 1 cycle per second = 1 Hz] and 150 Hz in the ventral occipito-temporal cortex in relation to word form analysis, in the superior temporal cortex and posterior part of the inferior frontal cortex during phonological analysis, and in the anterior part of the inferior frontal cortex during semantic analysis. (Lachaux et al 288)

If this is considered an average transmission velocity, then it seems that all of this information traveling to thirty-six areas throughout the brain, together with feedback circuitry, and yet giving sight recognition within 270 milliseconds, raises a number of questions. Is it all ‘simultaneous’? We must remember that perception is continuous, even when we blink. Are patterns already forming in other parts of the brain as the reflected light reaches the retina? Is there some sort of instantaneous ‘mirror-effect’ taking place? If perception anticipates the actual image, perhaps this explains why we often see what we want to see, and miss actual details. What is the role of the imagination if there is anticipated perception? How does this associate with the imagination as our principal pattern processor? These are the sort of questions that emerged as I undertook this research. That led me to undertake additional readings to consider
the relationship between the imagination and all of the senses.

Researching these questions, I also found that consciousness is a ‘slower’ neural process associated with preparation, reflection, and communication, and is in fact slow simply because it is one of the most complex processes the brain engages in. Imagining, like sight, is faster because it engages the primary functionality of patterning as a processing medium. These fast and slow processes combine in consciousness. This became one piece of the puzzle – connecting the imagination to the senses, a departure from traditional understanding about the imagination as an interior function not associated with the senses. Eventually I came to assert that it can be directly derived from the senses, as well as indirectly derived via aspects of memory and emotion. While largely being superseded by more recent studies, Kosslyn’s work anticipates my research readings in neural re-use, and projected connections between perception, memory, emotion, and genetic pre-disposition, which I then pursued.

Antonio Damasio, with *Self Comes to Mind: Constructing the Conscious Brain*, *The Feeling of What Happens: Body and Emotion in the Making of Consciousness*, *Looking for Spinoza: Joy, Sorrow, and the Feeling Brain*, and *Descartes’ Error, Emotion, Reason and the Human Brain*, all together enabled me to construct a large part of my research puzzle, especially as it relates to consciousness, the imagination, and its connection to emotion and memory. As a neuro-biologist, Damasio employs a view of brain function that emphasizes brain/body symbiosis: “… I propose that, just like emotion, consciousness is aimed at the organism’s survival, and that, just like emotion, consciousness is rooted in the representation of the body” (*Feeling* 37). In his writings he provided an analysis of levels of brain function, which is biologically inclusive, and doesn’t seek to overemphasize the role of consciousness as executive function, and therefore supports my critique of the notion of executive control, with regards to
imaginative functioning.

Damasio employs, in *Descartes’ Error*, another example of this method of observation of individuals with certain brain conditions as a means to discover emotional functionality. The lack of emotional connection prevented him from prioritizing, an interesting aspect of emotional functioning, which Damasio researched more thoroughly in his later texts. This reconstruction was informative for Damasio’s study of the connection between emotion and perception. After 1992 with the advent of fMRI technology, this type of neuroscience research became more evidence based, relying more heavily on the data acquired by the technology. Damasio’s work on emotion and the sense of self (consciousness) led to additional research on memory.

More research revealed connections to emotion at the non-conscious level. Recent fMRI results show that face recognition pathways associated with a remembered face simply do not engage when the subject is consciously attempting to ‘suppress’ the memory of that face. Is the conscious effort of the will not to remember, stopping a memory which is already engaging, or has it simply not started? Is the memory being consciously controlled? The same can be said of behavior patterns and points to the relation between non-conscious and conscious volition. Custers et al state that: “… positive shaping of behavioral states causes these states to act as nonconscious goals. We feel that investigating the role that positive affect plays in the nonconscious operation of goals and further exploring this process in particular may advance our understanding of how people are able to act on goals without knowing the actual source of their motivated social behavior”(140). Non-conscious and conscious processes are presumably

---

5 Some of his findings, in this specific instance, were later questioned by other researchers.
6 It is important to acknowledge that fMRI technology only provides a partial picture of brain function, capturing accurately approximately 30-50% of total function.
working in concert, even if opposition is involved, and an internal struggle often forms a positive part of that cognitive process. This research initiated further enquiry into the relationship between emotion, memory and imagination.

I began to refer to my classroom observations as they related to the findings revealed in my reading and neuroscience training. As it relates to the creative imagination, based on my classroom observations, preventing patterns of possibilities is not ‘stopping’ or suppressing their functionality; instead, when the critical faculty engages, the imagined patterns of possibilities move onto a non-conscious level. I began to understand the relationship between non-conscious emotion and conscious feelings, between non-conscious volition and conscious reasoning, and between non-conscious imagining and conscious creating. These neuroscience findings initiated further questions and suggested possible connections with my observational experience.

Current research has shown that the engagement of a fear response, for example, may ‘override’ other conscious functions. Le Doux and Debiec state that:

Fear and anxiety are evolutionarily developed responses to perceived or anticipated threat. They involve behavioral, autonomic [non-conscious], and endocrine alterations aimed at increasing an organism’s chances of survival.” and:

While innate pre-programmed fear reactions are inherited, acquired fear responses result from a capacity of an organism to learn and remember cues associated with danger experienced throughout life. Whereas fear is considered to be a response to an actual danger and is typically triggered by specific stimuli, anxiety is a state of preparation for a predicted threat, which can be real or imaginary. (24)

Perhaps suppression should not be discussed at the level of brain function, but as a description of conscious behavior resulting from brain function. Gaining more understanding of the
interactivity of brain systems and their relations to brain activities, also added considerably to my emerging picture of the brain.

Damasio’s research backs up my analysis of the conscious and non-conscious aspects of the imagination: “Creativity itself – the ability to generate new ideas and artefacts – requires more than consciousness can ever provide” (Feeling 315). In his latest book, Self Comes to Mind, Damasio confirms earlier suppositions with new evidence, and takes his understanding of the biological basis for brain function further, supporting an understanding of the three principal brain dimensions – genetics, brain chemistry, and the neuronal electro-magnetic dimension. His confirmation of the value of non-conscious thought is also supportive of my observations: “… non-conscious processes are capable of some sort of reasoning, far more than they are usually thought to be, and that this reasoning, once it has been properly trained by past experience… may lead to beneficial decisions” (274). Damasio establishes that an important aspect of cognition, both conscious and non-conscious, is image/pattern related: “… the brain is producing not just images of an object, not just images of organism responses to the object, but a third kind of image, that of an organism in the act of perceiving and responding to an object. I believe the subjective perspective arises out of the content of [this] third kind of image” (Descartes’ Error 243). Images are not only visual, but engage all of sensual communication possibilities. He also states “Of necessity, concepts precede words and sentences in both the evolution of the species and the daily experience of each and every one of us … the nonverbal narrative of knowing…” (Feeling 185/186).

This process initiated my research into developing compelling, or stimulating images – non-conscious images that become arousing, disturbing or compelling enough to reach consciousness. It also establishes that there is no barrier between consciousness and non-
consciousness. The notion of a barrier is a social construct with no physical evidence in the brain to support it.

Arnold Modell, with *Imagination and the Meaningful Brain*, became one of my principal sources. My definition of the imagination as patterns of possibilities comes from this work. Modell has identified the imagination as central to systemic brain functions, by providing ‘alternatives’. This is supported by the works of Jean-Pierre Changeux, in *Neuronal Man: The Biology of Mind*, Changeux, and Paul Ricoeur, in *What Makes us Think?*, and Rodolfo Llinas, with *I of the Vortex: From Neurons to Self* on the substrates of the imagination as alternatives in motor function, sense perception, memory, and even at the epigenetic level. This enabled me to understand imaginative functioning at the biological level. Modell states that: “What is singularly human is… our capacity for generative imagination, which relies upon the use of metaphor [compelling image] as a cognitive tool” (13). This notion of metaphor was intriguing, and with further enquiry I began to understand that metaphors were associative patterns, and resulted in my consideration of imaginative pattern processing, not only on the physical level, but also, connected with emotion and memory, to emerge into consciousness, which I came to consider as the existential imagination.

This is reinforced by the theory of neural re-use as undertaken by Michael Anderson, in *Neural Reuse: A Fundamental Organizational Principle of the Brain*. This extensive article explains Anderson’s theory together with reviews of current articles concerning this theory, so it provides both an overview and detailed description – for example:

Understanding requires imagination. In the example most extensively developed by Gallese and Lakoff, understanding a sentence like “He grasped the cup” requires the capacity to imagine its constituent parameters, which include the
agent, the object, the action, its manner, and so on. 2. Imagination is simulation. Here, the neural exploitation hypothesis dovetails with concept empiricism in arguing that calling to mind individuals, objects, actions, and the like involves reactivating the traces left by perceiving, doing, or otherwise experiencing instances of the thing in question. 3. Simulation is therefore neural reuse. Simulation involves reuse of the same functional clusters of cooperating neural circuits used in the original experience(s). (259)

This advances my theory of the imagination as playing a part in many aspects of brain activity on many levels, on a daily basis.

While I have some reservations about neural re-use theory as a unifying concept simply because of its claim to ‘universality’, there is wide acceptance of the notion that the brain functions on many levels simultaneously, and functional systems exhibit many layers of engagement, so sight also becomes insight, and co-ordination and visual patterns develop into abstract mathematical patterns as well. Eventually this leads to the notion of the mental workspace network as I will describe in chapter two.

There are additional texts serving as references for various models of brain function, such as Joseph LeDoux, and William Hirst, with *Mind and Brain: Dialogues in Cognitive Neuroscience*, and LeDoux’s own *Synaptic Self: How Our Brains Become Who We Are*:

Figuring out how the brain works is a daunting task. For that reason, neuroscientists usually work only on pieces of the puzzle – like aspects of cognition, emotion, or motivation – rather than on the whole organ and its systems at once. But if we want to understand how our brains make us who we are, we have to figure out how these individual processes blend together to cause
a person to emerge effortlessly from the electrochemical activities of the protoplasmic mass that is his or her brain. (301)

This overview has influenced my approach to this study, by characterizing it as deriving a set of principles from observation and clinical research. LeDoux provides an overview of the electro-magnetic neuronal system, from its smallest unit to the functional mind. How do we manage to transform the transmission of protein encoded data into complex systemic functions and conscious outcomes? LeDoux’s work on post-traumatic stress disorder (PTSD) became useful by connecting imagination, emotion, and memory in experiencing an altered-state reality on a non-voluntary basis.

This work led to further analysis of imagination and metaphor. George Lakoff and Mark Johnson have done extensive research in this area, as evidenced in *Metaphors We Live By* and Johnson’s *The Body in the Mind*. Johnson states that:

… metaphor is a pervasive, irreducible, imaginative structure of human understanding that influences the nature of meaning and constrains our rational inferences… an adequate account of meaning and rationality must give a central place to embodied and imaginative structures of understanding by which we grasp our world.” (12/13) and, “…metaphor [is] conceived as a pervasive mode of understanding by which we project patterns from one domain of experience in order to structure another domain of a different kind. (15)

While a cultural context of metaphor is usually described in terms of language, Lakoff and Johnson relate metaphor to the functioning of the imagination itself: “… all meaningful experience and all understanding involves the activity of imagination which orders our representations (the reproductive function) and constitutes the temporal unity of our
consciousness (the productive function)” (157).

In Lakoff and Nunez analysis: Where Mathematics Comes From: How the Embodied Mind brings Mathematics into Being, they state that: “… metaphor plays a central role in complex arithmetic” (421). In Ruth M. Byrne’s The Rational Imagination: How People Create Alternatives to Reality, she states that: “… human reasoning is rational, human reasoning depends on the imagination of possibilities, and the set of principles that guide the possibilities people think about when they reason also guide their imaginative thoughts” (215). Both of these works, ranging from the neuroscientific to the philosophical, cemented connections with my observations, and developed my understanding of the nature of the imagination further. From the combination of my reading, post-graduate classroom research, and my experience, I posited that rational and abstract thought are dependent on the imagination, and the imagination employs metaphor as a means of expression. Therefore metaphor forms a basis for our embodied cultural expression, and the creation of compelling (stimulating) imagery lies at the very centre of the creative process. My analysis of the creative process as imaginative cognition has drawn heavily on this research.

I have supplemented this research with shorter articles dealing with specific aspects of my thesis. These range from the work of Marla Sokolowski on the foraging gene, looking at epigenetic adaptation and protein code selectivity, to an exploration of the perception of time and its connection to altered state perception and quantum theory, as documented by Weder with regards to downhill ski racers: “Time slows down. If I had to define it, time simply slows down ... and that the awesome power of the brain starts to come forward in speed sports and it starts to redefine time” (51), and to Semir Zeki and his analysis of the perception of colour and connections to imagination, and of the creative impulse itself:
Nor do we sufficiently acknowledge that the almost infinite creative variability that allows different artists to create radically different styles arises out of common neurobiological processes. By probing into the neural basis of art, neurological studies can help us to understand why our creative abilities and experiences vary so widely. But it can only do so by first charting the common neural organization that makes the creation and appreciation of art possible. (51)

In my view, the imagination connects with the senses, and other mental activities, but it remains the imagination as systemic brain function with all of them. Imagination as an autonomous complex system is pre-disposed to engage with memory, emotion and the senses, in the production of imaginative activities, such as creating new work in the theatre, as well as survival on a day to day basis.

The distinction between brain function and activities employing brain function – sources and outcomes, became an important revelation. This allowed me to advance my three systemic functions of the imagination – possibilities/alternatives, patterns, and composition, and associate them with my three stages of creation – identification, transference and transformation. I then conducted a review of pedagogical research, looking at the theatre and dance from a cognitive perspective.

**Theatre/Dance Review**

The study of training methods for the actor in western traditions of theatrical presentation has a long and exceptional tradition. Actors, like jazz musicians, are both creators and performers. There are a number of texts addressing these training methods, employing a cognitive foundation. In John Lutterbie’s *Toward a General Theory of Acting: Cognitive Science*
and Performance, written in 2011, he provides an analysis of a number of approaches to acting in the theatre. This work follows upon the earlier work of Rhonda Blair and Bruce McConachie, which I shall review presently. It is centered primarily on an American approach to realistic forms of theatre. The training methods of Constantin Stanislavski, Michael Chekhov, Lee Strasberg, Uta Hagen, and Sanford Meisner are presented. A more cursory analysis is offered about the work of Vsevolod Meyerhold, Antonin Artaud, Bertolt Brecht, Jerzy Grotowski, and Jacques Lecoq. His focus is primarily on the work of the actor as an interpretive artist, in an actor-centred theatre. This is distinct from the notion of the creator/practitioner, or the creator/director/performer as an original creative artist in a creator-centred theatre. The actor-

7 Stanislavski (1863-1938) Russian theatre artist and theorist, developed methodologies for the actor, focused on the actor’s truth, in a more realistic theatre tradition emerging in Russia. His work was also influenced by currents in psychology, changing ideologies in Russian theatre, as well as his fellow practitioners. He was an actor, director, and teacher, and operated the Moscow Arts Theatre, with Nemirovich-Danchenko, which produced a number of the plays of Anton Chekov. His work influenced western traditions, in both Europe and America. Michael Chekhov (1891-1955) was the nephew of Anton Chekhov, and trained as an actor with Stanislavski. In the twenties he moved to Germany, and in the thirties to England, opening a school at Dartington Hall. In 1938, he moved to the U.S. and opened a school in Connecticut. A number of other teachers, claiming to be inspired by Stanislavski began working in New York. Lee Strasberg (1901 – 82) became director of the Actors’ Studio in 1951 and operated it until his death. He developed techniques which he called ‘the method’ based on Stanislavski’s work with emotional realism. Uta Hagen, a German-American actress formed a school with her husband Herbert Berghof, which also employed realist techniques. Sanford Meisner (1905-97) began with method acting and Stanislavski, and changed these methods into his own technique, practiced at the Neighborhood Playhouse in New York. All of these methods focused on training the actor, in an actor-centred theatre style, and reflected American culture and the influence of film.

8 Vsevolod Meyerhold (1874 – 1940) worked with Stanislavski at the Moscow Art Theatre, then established his own company and became head of a new cultural Commissariat under the Communist regime. As a director he developed innovative theatre spectacles, and employed a method called biomechanics, employing athletic and movement phrasing for the performer, to establish an at times comedic and circus-like style of performance. Artaud (1896-1948) writer, director, and performer was influenced by Copeau and Charles Dullin, worked on a number of avant-garde surrealist projects, and developed a theatre of cruelty. His work, and that of Charles Dullin influenced Lecoq’s training methods. Brecht (1898 – 1956) was a well-known playwright and founder and director of the Berliner Ensemble, was influenced by Meyerhold, worked with Max Reinhardt, Erwin Piscator, Helen Weigel, and Kurt Weill, among others, and devised ‘epic’ style performance techniques designed to distance the audience from emotional engagement to permit serious consideration of the political implications of the theatrical event. Jerzy Grotowski (1933-99) was a Polish director, whose physically engaged style of performance attracted an American audience interested in an alternative to realism. Jacques Lecoq (1921-99) was a French theatre teacher, influenced by Dullin, Dario Fo, and Artaud, employing physical techniques to develop creator/performers for an image-based theatre. All of these practitioners were interested in the creator/director and the theatrical event, employing the actor as a part of that creation.
centred theatre, employs a model in which the actor develops a role created by an author primarily for a text-based presentation.

The cognitive theory reference point Lutterbie employs for all of these training methods is: ‘DST (Dynamic Systems Theory): “Stimulations from the environment are… seldom isolated to one area of the brain but tend to have more global impacts. Gestalts [cognitive patterns] are the result of coordinated, harmonic oscillations; and emotion and appraisals always coincide in cognitive acts” (101). There are now certain concerns with Dynamic Systems Theory within the neuroscience community as a global framework of perception, and it has now become dated, however it does point to the notion of neural networks and systems of networks. There are explicit differences with neural re-use theory, and it is problematic with regards to current theories of genetic pre-disposition and the concept of a mental workspace. This theory was originally introduced by Poincaré as a mathematical theory of stable systems in the 1890’s, was developed further by Birkoff in the U.S., and then by Kolmogorov, and Andronov in the Soviet Union. It was applied by the British to develop radar and non-linear oscillators, and became a basis for chaos theory. Applications grew to include the physical and biological sciences, and influenced the development of quantum theory in physics.

It was employed as a study of early mental development emerging out of biology by Esther Thelen, employing the discovery that certain neurons in the cerebral cortex were capable of ‘two-way’ synaptic communication. Evan Thompson is cited in relation to conceptual applications of this theory, from a philosophical perspective: “This dialogical dynamic is not a linear or additive combination of two preexisting, skull-bound minds. It emerges from and reciprocally shapes the nonlinear coupling of oneself to another in perception and action, emotion and imagination, gesture and speech” (Thompson General Theory 102). This is
interpreted specifically in reference to the process of the inner dialogue undertaken as an actor develops a theatrical character.

Since that time, it has been discovered that this two-way communication is not limited to the cerebral cortex, and consciousness, but in fact exists throughout the brain, forming a part of most synaptic communication. When this discovery is coupled with the realization that the brain has at least ten times more capacity than was understood at the time DST was theorized; this process is now regarded as increasingly complex, involving all three brain dimensions. Basing analysis largely upon one global theory introduces some concerns which occur across the spectrum of cognitive analysis of the creative process, and is relevant to my own argument.

Lutterbie looks at training methods largely developed prior to associated cognitive neuroscience research. This is similar to my own reference to Lecoq’s methods, and he seeks to attach suitable cognitive analyses to explain them, in a sense to justify them as having a cognitive foundation.

This sort of validation is understandable, and has become an excellent object lesson in preparation for this thesis. My own pedagogy was also developed prior to my introduction to cognitive science. The principle difference between Lutterbie’s approach and my own lies in training the actor to interpret a role developed by a playwright for a realistic style of theatre, as opposed to training a creator/performer to develop original work, solo or collaborative, using image-based techniques. His approach had an extensive and pervading psychologically-based heritage to ‘overcome’. In my view, interpretive actor training by the practitioners mentioned above, fits well with and has been extensively interpreted by using aspects of psychological theory. Training creator/performers with Lecoq’s methods is largely free of this heritage and therefor, in my view, fits well with cognitive science.
In this thesis I have sought to resolve the concern over providing a cognitive justification of training methods by approaching a study of the imagination as brain function outside of the activity of creating. I discuss imaginative function as a process associated with the composition and perception of reality involving the biological and existential imagination. This is evidenced by my description of the imagination’s connection to the senses, emotion, and memory.

Allied to this theory, there is a more basic concern with regards to my own work, residing in Lutterbie’s understanding of creative ability and brain function. All creative processes have a component addressing what in effect becomes the establishment of corresponding procedural and implicit neuro-pathways – in music, there is a mastery of the instrument (including the voice) which is essential. One has to arrive at the point where one no longer needs to think about the act of playing or singing, but can focus on the act of making music, and the mechanics of playing become a non-conscious response. Recent research in jazz improvisation, as referenced earlier by Limb and Braun confirms this:

… deactivation of the lateral prefrontal regions represents the primary physiologic change responsible for altered states of consciousness such as hypnosis, meditation or even daydreaming. This is interesting in that jazz improvisation, as well as many other types of creative activity, have been proposed to take place in an analogously altered state of mind. Moreover, a comparable dissociated pattern of activity in prefrontal regions has been reported to occur during REM sleep, a provocative finding when one considers that dreaming is exemplified by a sense of defocused attention, an abundance of unplanned, irrational associations and apparent loss of volitional control, features that may be associated with creative activity during wakefulness as well. (5)
The same altered state development occurs in painting and sculpture, writing and dance, and in all aspects of theatrical performance. The process of getting past technique corresponds to the initiation of procedural pathway development. So to say: “Not everyone acts well, but everyone’s cognitive machinery works in the same way…. What makes actors unique is the way they are able to use the tools they have in common with everyone else to create performances that have the potential to enthral an audience” (103), is a valid analysis of the actor as interpreter, but is it applicable in an analysis of a pedagogy to develop the original creator/practitioner?

Can we say ‘the [cognitive] tools they have in common with everyone else’ about a composer, a choreographer, or a stand-up comedian? This generalization makes his analysis, while perhaps pertinent to interpretive acting training, not entirely convincing for the physical theatre creator/performer. These abilities require specialized skills and acumen, and even if an individual has manual dexterity, adequate hearing and potential movement ability, a sense of balance, a sense of humour, and adequate cognitive ability, does that mean that with enough training and practice he or she can become an original creative artist, if the training is not designed for that purpose? The fact that the training for actors as interpreters of text and image-based creators developing original work are different points to a certain incompatibility with my own training processes. When Lutterbie says that the only difference is training and practice, he is ignoring that there is a corresponding neural adaptation taking place in the brain – and the way that this adaptation takes place is highly individualized.

---

9 In my view, based on my experience as an actor, acting involves an altered state process as well, as evidenced by the relationship between the actor and the character.
Also certain individuals have circuitry that is already pre-disposed to establish these pathways, and strengthen them into networks. They progress quickly. Perhaps that is what we mean by ‘talent’? This question is at the base of the ‘nature vs. nurture’ debate in biology, as outlined by Luca Tommasi, Mary A. Peterson, and Lynn Nadel, Editors in: Cognitive Biology: Evolutionary and Developmental Perspectives on Mind, Brain, and Behavior. “If the study of evolution and development in the cognitive sciences is to be taken seriously, with attention to the proximate mechanisms and functions that underlie mind and behavior and their environmental and genetic constraints, it is clear that the enterprise is not logically separable from that of the life sciences” (11).

It is also relevant to the debate about apprenticeship vs. training. Seeing pre-disposition and adaptation as positive symbiotic processes is a more productive approach to training. This is what I mean when I refer to the ‘embodied brain’, and posits that training is the facilitation and development of the opportunities that this potential symbiosis may provide.

A further observation about Lutterbie’s analysis is an emphasis on the notion of consciousness as executive control: “Through exercising executive control, the actor attends to certain types of information and recalls experiences that bear a resemblance to the current circumstances” (111). Executive function is an umbrella term attributed to conscious cognitive processes that manage other cognitive processes, such as planning, working memory, attention, problem solving, verbal reasoning, inhibition, mental flexibility, and the initiation and monitoring of actions. It is interesting to note that this theory was first proposed in the 1950’s by Broadbent, and developed further by Posner in the 1970’s, both cognitive psychologists. This idea has been seriously questioned by more current neuroscience research, using fMRI technology. Does executive function also imply executive control? This notion points to what I
refer to as ‘the tyranny of the intellect’. The claim of conscious control and management of multiple brain functions, many of which are both conscious and non-conscious, by an exertion of conscious ‘will’ is, in my view, antithetical to the engagement of the imagination.

Consciously attempting to control one’s movement provides an excellent example. One only has to watch acrobatic trainees attempt to control coordinated acrobatic patterns consciously, by telling their bodies what to do, to witness the utter failure and comic frustration caused by attempting to employ executive control to undertake coordinated movement patterns. Movement, creative practice, innovation, in fact all processes initiated by and requiring the engagement of an active imagination are patterned processes, and as such are not compatible with executive control, a linear function. Linear function refers to a conscious rational process establishing a linear order to thought processes – a cause and effect function. Imaginative thought employs pattern processing providing an entirely different notion of order. Based on my observations, believing that if only one has sufficient conscious will, one can overcome all obstacles, while perhaps true as an act of survival in certain circumstances, is only wishful thinking in the development of works of art. The relationship between what I refer to as linear and pattern brain functions will be discussed further in subsequent chapters.

Rhonda Blair, in: *The Actor, Image, and Action: Acting and Cognitive Neuroscience*, also utilizes acting processes as defined principally by Stanislavski, but also Adler, Strasberg, and Meisner for a realistic American genre of theatre employing a traditional psychological base. She relates a variety of theories of mind to aspects of acting, but goes on to state that:

What all of these cognitive psychology models have in common is that they define some kind of *imagination* – in the sense of consciously and unconsciously imaging certain problems and situations – as a foundation for our functioning in
all regards. The study of where and how these images rise to consciousness out of
the matter of our brain and being is the provenance of neuroscience. (19)

She develops some interesting parallels with cognitive processes. “Key attributes of
consciousness, which derives from the sense of a self, have correlatives in the vocabulary of the
system that allow us to connect the science directly to elements in approaches to acting and
caracter. Among the key terms are self, consciousness, reason, environment, behavior,
attention, emotion, feeling, and imagination” (60).

She defines imagination in this way: “Imagination is the result of the brain’s evolutionary
development and is essential to the fact of our physicality, not just our psyches. Actors
consistently get at imagination by engaging the senses… Imagination, in not just its
psychological, but also its physical dimensions, is a basic component of consciousness” (62). She
develops direct correlations between neuroscience and creative practice for actors, and some of
these are useful in an analysis of the creator/practitioner as well, but there are substantial gaps:
“All of the cases are about traditionally scripted theatre, rather than improvisational or
experimental performance; however since all performance is ultimately about how images in
somebody’s head work on the bodies of the performer and of the audience, I believe there can be
applications for any kind of theatre (but that is another book)” (84). Such generalizations again
betray a bias towards the actor as interpretive artist, in an actor-centred theatre, in a culturally
specific context. Blair’s use of a number of science sources in her analysis provides a more
eclectic interpretation, as opposed to Lutterbie’s reliance on one primary source. My own work
in this thesis also employs this methodology. Since much of neuroscience research has only
approached the notion of imagination as brain function indirectly, we have both sought to draw
from a number of scientific sources.
Blair attempts to equate Stanislavsky’s pedagogy with neuroscience: “Though Stanislavsky’s vocabulary is different, his project to connect cognition, imagination, action, emotion, and the body resonates with Damasio’s connection of homeostasis to extended consciousness” (66). She then seeks to transform these methods into a new process: “A new vocabulary based on neurocognitive research provides a specific, material way of talking about the phenomenon of acting rather as that of a single organism, keeping the psychoanalytic or psychological in its proper and useful place” (82).

She goes on to describe individual training and production examples to engage aspects of her understanding of her scientific reading, to apply her findings to her practice. In my view this engages the notion of ‘brain-based learning’, in an attempt to connect brain function to direct applicability in practice, and to assert that there are exercises which directly affect and develop brain function. For example, a study of frequent users of computer games registered an increase in the speed of hand-eye co-ordination and attention, and this was posited as possible functional brain development. However, six months after these users stopped playing, their hand-eye co-ordination returned to normal (Tahiroglu et a 672). There was no lasting change that could be detected. The brain is highly adaptable, but that is not the same as claiming brain development.

My own study seeks to relate imaginative brain function to creative practice, but not by citing an individual scientific theory, as Lutterbie does, or by identifying a set of brain theories and applying their findings directly into practice, as Blair seeks to do. These brain-based learning concepts have been largely discredited, simply because their claims are unproven. McConachie states, in Falsifiable Theories for Theatre and Performance Studies, that: “Scientists do not arrive at objective truth, but, through experimentation and argumentation, good science narrows
the range of possible explanations and interpretations” (571). This statement is relevant to applications of scientific theory in theatre practice, and has influenced my own observations.

Other works of cognitive-based analysis of theatrical presentation include: Bruce McConachie’s *Engaging Audiences: A Cognitive Approach to Spectating in the Theatre*, and McConachie and Elizabeth Hart, editors: *Performance and Cognition: Theatre Studies and the Cognitive Turn*. McConachie’s work also includes *Theatre and Mind*, a primer for a cognitive interpretation of theatrical engagement, and *Perspectives of Teaching Theatre*, a compilation of cognitive interpretations of aspects of teaching theatre, principally in the academic environment. Together with his colleagues, McConachie is useful on the level of cultural and embodied metaphor from the perspective of the spectator and the teacher/philosopher. The compilation of articles in *Performance and Cognition* provides excellent insights in terms of the actor’s body, the representative theatrical space, and analysis employing aspects of Fauconnier and Turner’s work as well as Antonio Damasio and Lakoff and Johnson.

Most of the studies contained in these works are about interpretation, with some reference to the interpretation of specific theatre canon pieces, offering a re-interpretation of traditional semiotic theory. Most of the earlier theories referenced in all of these works, including an evolutionary perspective on brain development based in anthropological studies, such as Schechner’s work on the rationale of play as a cultural phenomenon, as well as recent mirror neuron theory. These theories are then related to the training of actors based on notions of the mind, principally drawn from psychology, as well as notions of spectating.

It is relevant to my thesis, to note just how much training processes have been influenced by, and make use of theories derived from more traditional psychological theory. This indicates how important an analysis based on imaginative brain function may be to creative practice now
and in the future for the creator/performer. While I certainly do not discount the contribution of such training gurus as Stanislavski and Strasberg, attempting to blend these notions with neuroscience is attempting to reconcile a traditional theory of mind with a contemporary theory of the brain. It is important to appreciate that cognitive science has incorporated aspects of many theories from traditional psychology, but has re-interpreted, and many times has transformed them in keeping with new discoveries in neuroscience. These authors have attempted a similar process with actor training and audience reception. It is not my intention to be critical of this excellent research, but merely to clarify the substantial differences between the approach provided by these authors, and my own.

The differences between acting training, and training the creator/performer are significant. While these texts are both relevant and useful in the cognitive development of acting techniques primarily for a realistic/interpretive style of theatre, as well as audience reception, it is important to place an understanding of creative practice within a wider context. I view these texts as part of a continuum of changes in the approach to training in the theatre. This thesis is a continuation of this transformational change in theatre training.

The work of Rick Kemp in *Embodied Acting* takes actor training analysis further, and combines it with training methods drawn from Lecoq, Grotowski, Laban, and Monica Pagneaux and Philippe Gaulier, to emphasize a mind/body symbiosis and an approach to acting which includes non-verbal communication: “… the information in this book will be part of a significant shift in the understanding, theory, and practice of acting. … I feel that it is justified by the magnitude of the changes in understanding of the human mind that have led to the concept of the embodied mind” (18). Again, this book focuses on acting, but is inclusive of a wider range of acting styles, and is cognizant of the creator/performer.
Kemp’s book is in part a ‘how to’ description of specific exercises, together with a cognitive interpretation of methods. “The material that I have presented offers empirically derived descriptions of cognitive activities involved in key aspects of the actor’s process: non-verbal communication; the relationship between thought, speech, and gesture; self and character; empathy; imagination; and emotion” (197).

His reference to imagination is presented as follows: “Recent research has given us a more sophisticated understanding of imagination than was available to Stanislavski. Cognitive science demonstrates that the imagination is not a discrete or specialized function, as was often thought, but that it is a feature of cognition that is woven through much of our mental processes as metaphoric activity” (109). To justify this he invokes simulation theory and mirror neurons.10

Concerning mirror neurons, referred to by Kemp, McConachie and others, originally discovered by Rizzolatti, Gallese et al, in macaque monkeys in 1997, there has been considerable controversy. They have not been found as such in humans, although several discrete areas of the brain, principally in the limbic system, are thought to exhibit similar qualities. However, many scholars have referred to this ‘mirror system’ as the basis for imitative learning and development generally, from motor function to language development, socialization processes including cultural engagement with stories, performances and works of art, empathy, and even human altruism. This points to a more general concern with the interpretation of scientific research by Humanities and Arts scholars. In my view, although I cannot prove this so far, the fact that we

10 As an addendum to this review, at a recent symposium I attended a presentation by Kemp, in which he outlined a research project he is undertaking now with McConachie, to analyze the relationship between performer and audience as cognitive function with specific reference to the mirror neuron system. They will employ small cameras on stage to record the performance, and several small cameras in the audience to record responses. Then they will employ face recognition software to provide statistical evidence of reactions.
cannot find mirror neurons in humans, points to the notion that perhaps it is an evolved system in humans which has a close association with imaginative brain function, and those areas in the brain identified as areas exhibiting mirror neuron function are perhaps parts of the ‘autonomous’ imagination brain system.

The work of Richard Courtney in *Drama and Intelligence: A Cognitive Theory* is interesting in relation to this study, as he has employed empirical analysis and observation, as well as research in cognitive science to develop his own theories about the creative process in a developmental context, applicable to the school system. His philosophical approach provides parallels with a number of my own empirical observations. While this book was written in 1989/90, and therefore has not been able to take advantage of more recent advances in cognitive science, it is remarkable that many of his observations and his theories remain relevant and incisive: “Our creative imagination and dramatic actions are experienced as a whole, and together they create meaning. They bring about the ‘as if’ world as possibility, which works in parallel with the actual world and is a cognitive tool for understanding it. Imagining and dramatic acts work by transformation…” (9). It also demonstrates the many advances that have been made as a result of more recent research.

I cannot complete a review of theatrical training methods without reference to the work of Jacques Lecoq, based on his text *Le Corps Poetique, or (in translation) The Moving Body*. This work is in part a description of the processes employed at his school, and in part a philosophical reflection on his intentions with regards to his methodology. “… the school pays more attention to creative than to interpretive work, since it prefers to encourage new writers rather than depend on existing plays…” and “Only by going beyond the frontiers, passing from one [dramatic] territory to another and overlapping them, can true creativity be nurtured and new
A review of dance texts provides another view of a cognitive interpretation of training and practice, especially with regards to an embodied understanding of imaginative processes. In *Neurocognition of Dance: Mind, Movement and Motor Skills* edited by Blasing et al., they state that this book discusses: “… the wide range of interrelations between body postures and body movements as conceptualized in dance with perception, mental processing and action planning” (1). The book emerged out of a symposium which brought neuroscientists and cognitive scientists together with dance trainers and practitioners, at Essen Germany in 2010, and resulted in a series of articles.

It is divided into three parts, the first talks about scientific theories related to movement and memory, the second presents the work of dance trainers and choreographers connecting practice with cognitive processes, and the third brings both of these elements together to look at possible outcomes. In the initial section there is an ongoing reference to ‘mental representation’ which in my view forms a connection with both memory and imagination.

… mental representation makes it possible to select and combine effective sources of information…. Dancers have to use their mental representation as a
foundation to identify possible and functionally relevant sensory inputs.

Frequently, this identification has to be made under extreme time pressure.

Hence, mental representation in dance has to be available quickly and provide clear criteria for selecting relevant pieces of information... [it] helps to shape interaction patterns ... in purposeful ways. (12/13)

This relates to the notion of visioning in sport and acrobatics. A downhill skier pictures himself successfully skiing the entire course just prior to actually doing it. Two elements are essential, however. He must picture himself, and not just ‘a skier’, and he must picture the entire sequence successfully. I have used this same process many times in acrobatic training. It points to the intimate relationship between imagination and memory, together with their relationship to sensory processing of movement patterns, all on a largely non-conscious level.

During my analysis of this work, I again came upon the process of interpreting set movement patterns drawn from the classical dance repertoire, with its accompanying emphasis on memory, especially long term memory. This points to a similar process engaged by actors. Dancers are associating specific movements with specific musical and environmental structures, and actors are associating specific reactions in action and emotion with specific textual structures. While rehearsal and performance are part of physical theatre as well, my focus is primarily on creating, and while there are overlapping aspects to both of these processes, creating original material has many unique characteristics and cognitive processes not dealt with in the same manner as the process of performing in an interpretive context.
From the perspective of the detail of constructing movement patterns as a cognitive process, there are parallels with the work I will present in the next chapter on proprioception and kinaesthetics. They talk about goal posturing, movement simulation and anticipation, and autonomous motor planning which relate specifically to a discussion of the relation between stillness and movement, and a skeletal vocabulary of movement possibilities. From a scientific perspective much of this cognitive and motor function research has been drawn from the robotic engineering of movement, as aspects of this research are interpreted from this source. Some of their conclusions included: “…human brains contain neural networks that are simultaneously responsible for motor control, perceptions of movement, imitation, planning movements and imagining them” (70). This coincides with the notion of imaginative pattern processing. However, there are marked differences between memory tasks associated with accomplishing pre-set ballet choreography, and the relationship between memory and imagination in the process of creating original imagery for the stage.

From the perspective of the dance teacher, there is a heartening recognition of the relationship between training and an appreciation of cognitive processes, as well as discovery through experience. This is also reflected in a very personal description of the process of developing new choreography. A reference to kinematics teaching methodology (KTM) and different types of intelligence, emphasizes the neural reuse theories of Anderson et al referred to earlier, relating kinaesthetic and mathematical learning connectivities in children. There follows a discussion of KTM techniques for learning kinaesthetically used with dyslexic children.
An analysis of the observation of dance involves a study of the mirror neuron system in humans, and equates those aspects of the brain engaged with representing movements directly to those parts of the brain engaged with motor functions. In my view this provides evidence of the connection between the imagination as representing movement images and motor responses activated while observing others movement activities, or the engagement of the embodied imagination. “This study supports the idea that we perform an internal simulation when we observe an action and that this simulation is represented in the brain, evidenced here by stronger activity in regions involved in the action observation network” (161).

The connection between the imagination and emotion is emphasized in a study of an aesthetic response to dance movement, which registers similar responses between the representation network, motor function and emotional stimulus. It must be remembered that all of these observations concern the act of observing dance movement only, or reception. It is not possible at present to record active processes using fMRI technology. Reception and creation, neuroscientifically speaking, involve very different mental processes.

An analysis of a relationship between neuroscientific research and dance creation, called experimental choreography, is also informative.

The benefit of radically combining dance and neuroscience is the potential to change the way in which we look at (and validate) the outcome of choreographic research on one hand, and how we implement aesthetic considerations into experimental methodology on the other hand… Science investigates the invisible. Art makes us experience it. (211)
Affective Performance and Cognitive Science: Body, Brain, and Being, edited by Nicola Shaughnessy, is a theatre and dance text with updated contributions from McConachie, Blair, Lutterbie, and others, in which there is an investigation of the scholarly and performative connections between art and science. “The chapters collected in this book similarly demonstrate the value of performance and science engaging in theoretical exchange and interactive practice” (24). There are discussions of individual plays and performance pieces which deal with cognitive themes, from Shakespeare to contemporary performance pieces inspired by quantum theory in physics. Many of these articles are responses to, and analysis of productions, and engage primarily with reception, as well as discussing the role of the actor using cognitive analysis employing affect theory and dynamic systems theory (discussed earlier), and others.

Rhonda Blair’s discussion of the role of the actor from the perspective of science is principally an update of her book, reviewed above. “Both cognitive science and affect theory are umbrella terms with considerable overlap. Both encompass various aspects of psychology, neuroscience, psychiatry, anthropology, and linguistics, among other disciplines, and are informed by various philosophical approaches” (133). She defines, and then applies these terms and findings to introduce a notion of ‘the science of acting’ as defined by Roach.

McConachie continues his analysis of reception by associating it with dynamic systems theory as described by Thompson. “I will rely on the paradigm of Enaction, also termed dynamic systems theory, to describe and explain the major activities that spectators practice” (184). This analysis, while coherent and specific, has little direct relevance, in my view, to an analysis of creating and the imagination as brain function. He makes reference to Panksepp and Damasio’s analysis of the emotion system, which supports my introduction of an emotional system in the brain, in connection with the imagination and memory systems. For the spectator, McConachie
emphasizes that empathy is essential. “… empathising is crucial for spectators attempting to negotiate and understand both the theatrical and the dramatic levels of all performances” (191). This analysis, with an emphasis on dynamic systems theory (DST) relates to Lutterbie’s article on the complexities of gesture, and the interpretation of gesture.

Lutterbie states that: “…this model of multi-modal expression [DST] is relevant to all aspects of human activity, onstage or on the street, and can be seen as a foundation for understanding creativity” (104). His reference point remains the actor in performance, although there is an indirect reference to the moment of not knowing as a means to engage the creative process. “The triangulation of thought, word and movement coalesce in the moments when ambiguity or the need for nuance create, however briefly, a caesura in the communication; and the communication that emerges from this conjunction has the potential to reveal the speaker’s state of mind, her psychological and physiological commitment to what is being said, as well as the manifest content” (112). This theory relates to the notion of the invisible becoming visible, which is equally relevant for the actor and the creator.

Amy Cook discusses the concept of conceptual integration theory, or blending. She states that: “…we use compression in all of our thinking and speaking as a way of connecting networks of associations, from the concrete and physical to the abstract or theoretical” (88). This concept introduces the notion of associative pattern processing, which I describe as one of the functions of the imagination. Her analysis attempts to connect dynamic systems theory, affect theory, and conceptual blending as a means to appreciate the nature of theatrical performance. “These chapters use the insights found at the intersection of theatre, performance, cognitive science, and affect theory to put pressure on our conceptual categories” (90).
There follows a series of articles describing individual performances employing a cognitive perspective. While this book offers excellent examples of the relationship between cognitive theory and theatre practice, it does not address, in my view, the imagination and its relationship to creating original material.

*Kinesthetic Empathy in Creative and Cultural Practices*, edited by D. Reynolds and Mathew Reason, 2012, provides excellent insight into aspects of kinaesthetic analysis in a variety of contexts, from autism, to dance, and performance imagery. Over a series of thematically organized articles by a diverse set of scholar/practitioners, it connects the notion of embodied empathy with mirror neuron theory. Kinesthesia is defined as a means: “...to refer to sensations of movement and position” (18), and is closely related to proprioception, which is: “sensing of one’s own position and movement stimuli, from within the body…” (18). It is posited, with reference to Gallese, that the so-called mirror neuron system provides embodied simulation or “… a body state shared by observer and observed” (19). With an acceptance of ‘embodied cognition’ as one basis for this enquiry, the mirror neuron system theory was then expanded to include sensorial, emotional, and imaginative responses.

Kinesthetic mirroring refers to the notion of mimicry, implicit in learning, physical development, as well as an embodied experience of empathy, or emotional mimicry. Empathetic understanding is then linked with simulation by the observer. This opens up a study of empathy and its relation to aesthetic experience and a sense of identification. It is noted, however, that this problematizes an understanding of empathy, when one considers the critique of this aspect of empathy as presented by Brecht and others, which rejects the
notion of an uncritical or ‘unknowing’ sympathy, or what I describe as sentimentality, for a notion of engaged witnessing, especially in a critical context.

This is then explored in performance with autistic children and the use of puppets, which allowed the participant observers to ‘remain conscious of themselves pretending’. This has close connections to my notion of the existential imagination, to be analyzed later. It is interesting to be introduced to descriptive research with autistic children by artistic practitioners, supported by psychologists, as it has parallels with my own enquiry. An aspect of empathy that is emphasized comes from the work of Evan Thompson, and is referred to as ‘imaginative transposition’. A recognition of autism as a spectrum condition involving a ‘neuro-divergent imagination’ provides an opportunity to acknowledge some aspects of imaginative function in practice, even though there is no direct reference to the imagination as a system in the brain, as this is replaced by aspects of mirror neuron function, which is then expanded into a mirror neuron system in the brain, even though it is acknowledged at the same time that a mirror neuron system is still considered theoretical.

Kinesthetic empathy is also analyzed with reference to the participant observer in an everyday context, as well as in a therapeutic circumstance. This is related to a response to dance movement, to answer the question; why do people watch dance. This is then related to intersubjectivity and kinesthetic empathy with regards to watching film. In an analysis of observing dance, empathy is replaced by ‘affect’: “Affect denotes a stage where emotions are still in the process of forming and have not yet taken on a definable identity: indeed they resist such definition” (124). This understanding of affect forms a part of my notion of identification, where affect is present but in suspension. This is described as having an emotional ‘intensity’. Most of these articles deal with a behavioral outcome of cognitive
processes, due to an emphasis on an embodied process, while acknowledging an intimate connection with affect and memory in an appreciation of movement, especially ‘metaphorical’ movement, where metaphor refers to the interpretive qualities inherent in movement. Observations such as: “… we feel the interweaving of kinesthesia and proprioception, and the object of our perception is at one and the same time the dancers’ performance and our own intermodal processing” (131).

The final section of this book is comprised of a series of articles relating kinesthetic empathy with a detailed analysis of the process of watching film, theatre, and observing photography, including photographs of movement, and sculpture, including performance inspired by sculpture. From my own perspective this involves a kind of reversal in my understanding, as the principal analysis in this book is from the perspective of reception, and my own analysis concerns creation. Reception is referenced so often, I believe, simply because a great deal of the science-based research practitioners depend on, involving the use of fMRI technology, must be a passive process.

I recognize, at the same time that there are intersecting points in both of these studies. The idea of observing stillness is interesting as a constructive tension and defines my perception of a dynamic relationship between stillness and movement as I will describe in detail in subsequent chapters. One of the most important aspects of these articles is the relationship between kinetic research as scholarship and its influence on practice. The science and the art, as related to this type of dance are, in this context, becoming one.

After a review of current literature concerning a cognitive analysis of theatre training, I am confident that my study takes this analysis in a new direction, and provides insight which has not, until now, been undertaken. The review of relevant literature in neuroscience and cognitive
science has permitted me to relate my experiential observations to a larger picture of the brain, and my review of the theatrical cognitive-based literature has permitted me to bring that picture into clear focus in the development of this thesis.

A notion of non-conscious and conscious imagining have deep roots in western thought. A history of philosophical interpretations of the imagination provides a rich panoply of ideas. It is interesting to note the changed perspective employed in a philosophical approach. I will attempt to provide a review, as a means of situating my observations within a wider consideration of imagination. At the same time, it is important to note that my approach to a study of the imagination in creative practice is focused primarily on, and is limited to, the development of a practice through training paradigm. Therefore, concentrating this wider discussion on an analysis of the imagination as it relates to the sources of the creative impulse, instead of the outcomes, is generic to my devising of a set of principles about the imagination. I am also concerned that I do not over-emphasize a purely philosophical consideration, as this thesis has a practical focus, and I will therefore also include artists’ views on the imagination, to ground my discussion in creative practice.

**Philosophical Review**

A sampling of western philosophy about the imagination, reveals a non-conscious and conscious dualism concerning imaginative brain function. All of these philosophers are, in my view, attempting to establish enculturated philosophical principles concerning the functioning of the imagination, and a ‘scientific’ approach to an understanding of the imagination has only emerged in the twentieth century.
The imagination in consciousness is often related to reason and judgement, which, I interpret as being an outcome of imaginative function. Imagination supports and enables reason and judgement. It is therefore appropriate to consider my definition of imaginative brain function in this context. Johnson, in *The Body in the Mind* (141 – 144) posits that Plato regarded the imagination with suspicion, and did not consider it a genuine mode of knowledge. In book 6 of the Republic he stated, according to Johnson, that the imagination was the power of forming images\(^{11}\), which he considered the lowest form of cognition. This can be interpreted as a non-conscious notion of imagination.

According to Plato, it provided fleeting impressions as opposed to grasping the essence, and since rational knowledge transcends the senses, the poetic imagination, grounded in the senses, was not considered rational. He referred to imagination as ‘phantasia’, or appearance, suggesting that the imagination dealt in images, which were brought into consciousness for rational consideration.\(^{12}\)

To me, this asserts a dominance of reason over imagination in consciousness, and provides one tradition, in which the imagination is subservient to, and dependent upon reason. Aristotle, on the other hand, posited that the imagination was the faculty of mediating between sensation and thought. It was dependent on sensation and made thought possible. Imagination was the faculty of forming images from sense perception, and provided the contents of our knowledge of the physical world. To me, this confirms a non-conscious ‘biological’ context for

\(^{11}\) In my view, images are not only visual, and metaphorically can be sensual - auditory, tactile etc., and emotional, or stimulated by memory.

\(^{12}\) Reason is only one form of logic. Patterns are also logical, mathematics being an interesting example. (See Fauconnier and Lakoff.)
the imagination, and also confirms a subsequent notion of imagination as an ‘interior’ process. However, Aristotle still considered it a secondary or inferior activity to consciousness.

According to Johnson, a Platonic interpretation becomes associated with treatments of art and beauty and the development of the aesthetic sense, and was also associated with a notion of ‘fancy’ and the unreal, resurfacing centuries later with Freud. The Aristotelian imagination was regarded as indispensable for connecting sensory experience and memory, including the notion of observation, which Husserl and Heidegger develop in part into the concept of empiricism. If these two notions of imagination are contrasted, a dualistic concept of imagination begins to emerge, in which non-conscious imagining is revealed as sense-related non-rational images, and on the other hand, the conscious imagination supports and is subservient to reason. These concepts of imagination have been subsequently expanded and transformed.

Hobbs modernized and wove these two themes together – all knowledge and cognition stem from experience, which creates memory, and creates judgement and fancy. Judgement creates strength and structure, and fancy creates art. This notion of imagination on one side and reason on the other as equals, heralded in the Romantic period. Romanticism celebrated the capacity for creativity and novelty in art, literature, and science. Kant emerges from the Romantic period and is influenced by the Enlightenment.

He wrote three Critiques – Pure Reason, Practical Reason, and Judgement. According to Johnson\(^\text{13}\) (162 – 164) he posited in Pure Reason that all judgements were functions of a unity among various representations. This posited the ability to synthesize an argument. In his consideration of the reproductive imagination he posited that all knowledge involved judgements

\[^{13}\text{I employ Johnson for two reasons: he is an established philosopher, and his work on imagination has many parallels with my own.}\]
in which mental representations via the senses, images, and concepts, were unified and ordered under more general representations. Imagination achieved this synthesis by three means: an apprehension in intuition, or grasping separate images as a unity; a reproduction in imagination, or the power of representing what is no longer present; and a recognition in a concept, or recognizing what we experience, engendering empiricism, and the rules of association. It is interesting how closely this coincides with my notion of pattern or schematic processing via the imagination. Modell interprets Kant’s view thus: “… Kant… taught that our knowledge of the external world is constrained by the structures of the human mind. The external world ‘as it is’ is essentially unknowable…” (22). Modell describes the imagination as functioning to provide alternatives and possibilities as conscious processing to support the faculty of making choices, and therefore functions in support of reason.

In Practical Reason, Kant viewed the productive imagination as giving us individual subjective experience, and he posited that there can be no meaningful, objective experience without imagination. He stated that the schematic imagination mediated between sensing and understanding. The imagination was a schematic activity for ordering representations in time, and could be transcendental or empirical. Imagination establishes order in our experience. To me this means that reason and imagination are symbiotic, as well as establishing that the imagination is intimately connected with the senses, and perhaps also to Hawking’s notion of space/time, as related in A Brief History of Time.

In the Critique of Judgement, a judgement was a reflection and created new or novel representations, by generating new meaning. Reflection became an imaginative activity. The imagination was both formal and embodied, and the creative imagination remolded existing
patterns to generate new meaning. This notion that the imagination was both formal (by engaging memory and emotion) and embodied is central to my thesis.

Following Kant, and the emergence of the age of reason and eventually the modern era and empiricism, notions of imagination have gone through a number of iterations. Darwin, in *The Descent of Man* states that: “The imagination is one of the highest prerogatives of man. By this faculty he unites former images and ideas, independently of the will, and thus creates brilliant and novel results” (51). Darwin’s commentary suggests that imagination is free of executive control, or will.

In a loose parallel with the Platonic and Aristotelian debate, Freud sublimated imagination into a more scientific reference to his theory of the sub-conscious. Imagination was relegated to a notion of ‘fantasy’ and the unreal. Modell states that: “Freud did not recognize an autonomous imagination. Instead of imagination, Freud spoke of fantasy. Fantasy, Freud believed, is a representation of an instinct or drive”(108). In *Psychopathology of Everyday Life*, Freud states that:

… a large part of the mythological view of the world, which extends a long way into the most modern religions, is nothing but psychology projected into the external world. The obscure recognition of psychical factors and relations in the unconscious is mirrored… in the construction of a supernatural reality, which is destined to be changed back once more by science into the psychology of the unconscious. One could venture to explain in this way the myths of paradise and the fall of man, of God, of good and evil, of immortality, and so on, and to transform metaphysics into metapsychology. (258-259)

Jung, with a less skeptical point of view, posited the notion of the collective unconscious:
… so far as we can say anything about it at all, it appears to consist of
mythological motifs or primordial images, for which reason the myths of all
nations are its real exponents. In fact, the whole of mythology could be taken as a
sort of projection of the collective unconscious... We can therefore study the
collective unconscious in two ways, either in mythology or in the analysis of the
individual. (325)

This psychological notion of the unconscious posits a rich inner (non-conscious) well-spring of
imagery available to the conscious self through the imagination. Generally, in both Freud and
Jung, there is an attempt to equate the communal legacy of imaginative creation with the
individual psyche.

The notion of imagery which also emerges as metaphor becomes a significant advance
towards the consideration of the imagination as brain function. William James, according to
Modell, describes imagination this way: “James wondered about the brain’s activity in forming
such [compelling] images and suggested that sensation and imagination utilize the same areas in
the cerebral cortex. Approximately one hundred years later this speculation appears to be
confirmed by Stephen Kosslyn and his colleagues” (109). Modell is referring to Kosslyn’s
discovery of imaginative function between visualization and perception.

Aristotle employed the term metaphor to mean a ‘decorative’ figure of speech, a literary
device. However, over the centuries it has transformed, and with Lakoff and Johnson it has come
to mean a form of thought, a form of cognition. Modell defines it this way: “Metaphor not only
transfers meaning between different domains, but by means of novel recombinations metaphor
can transform meaning and generate new perceptions. Imagination could not exist without this
recombinatory metaphoric process” (27).
In eastern philosophy there has been an attempt to develop a singularity out of this imaginative dualism. In *The Method of Zen*, Eugen Herrigel, a German artist/philosopher, states that:

No other creature is constituted by nature, as man is, not only to live spontaneously from the centre of being, but, in spontaneous understanding of the whole of life, to reveal the secret of all existence. He has been granted the ultimate possibility of bursting the bonds of his individuality, of entering into ultimate contact with everything that is, of encountering everywhere in the external world something akin to him, of perceiving in this kinship himself, and in this self, becoming aware of the centre of being, so that he lives as much as he is lived. (100)

This balance of the external and internal provides a ground upon which the imagination can be manifested. From the same author, in *Zen and the Art of Archery*: “The artist sees himself on the brink of new possibilities, but discovers at the same time that their realization does not depend in the slightest degree on his good will…. everything that he does is done before he knows it” (43). The creative process is not initiated consciously, and is not dependent on conscious acceptance. There are specific relationships between these philosophical notions and Lecoq’s methods of training.

From the perspective of the artist, Antonin Artaud, theatre philosopher and practitioner, states that: “What is important is that, by positive means, this sensitivity (awareness) is put in a state of deepened and keener perception, and this is the very object of the magic and the rites of which the theatre is only a reflection” (91). “One does not separate the mind from the body nor the senses from intelligence… From the point of view of the mind, cruelty signifies rigor,
implacable intention and decision, irreversible and absolute determination” (101). Employing the term cruelty, in my view, (and some commentators would disagree), Artaud refers to the imagination in the act of creating. Artaud aimed for a ‘theatre of cruelty’ which was unsentimental, as echoed in Herrigel’s view of the artist and in Brecht’s interpretation of the theatrical experience. Both Herrigel and Artaud had a strong influence on the work of Jacques Lecoq, and were referenced in his training. Based on a duality of imagination, which I believe, characterizes western thought, and therefore my own understanding, I will continue my definition of the imagination as brain function in the next chapter.
Chapter 2
Imagination and Creation

This chapter investigates a set of theoretical principles concerning the imagination as cognitive function, based on scientific readings in neuroscience, cognitive science, and neurobiology, as reviewed earlier, as well as providing experiential observations of creative practice pedagogy drawn from theatre training. Key to my investigation is acknowledging that the imagination is a function of the brain. Imaginative brain function is defined as an autonomous systemic, interconnected brain system capable of activating to produce specific outcomes enabling the human organism’s fitness for purpose.

I contend that there are two interconnecting facets of imaginative functioning referred to as the biological imagination and the existential imagination, both active on a conscious and non-conscious level. From the first facet I focus on one aspect of biological imagining, which I refer to as the tactile imagination. The tactile imagination is that aspect of imaginative brain function associated with the sense of touch, at all levels of experience, here employed to stimulate the generation of original material for a style of performance known as physical theatre.

This embodied analysis posits three imaginative processes – the provision of possibilities, the development of associative patterns, and image composition. Specific connections are posited with memory, emotion, and the senses, in support of embodied theatrical composition, involving a three-stage experiential process of identification, transference, and transformation. This embodied creative process, also engages the existential imagination, associated with consciousness and a sense of self. The engagement of the existential imagination in creative practice is initiated by an altered perceptual state, a cognitive reversal in which conscious cognition supports the imaginative process, initiating discovery and invention. I propose, via this
study, to enhance an understanding of the nature of imaginative brain function as it relates to training for the creation of original material for the physical theatre.

I contend that everyone possesses an imagination, and the biological purpose of the imagination, as a complex and autonomous function of the human brain, is to optimize our survival and our fitness for purpose as a species, individually and collectively. In that context, I contend that we employ our imagination in the perception of our physical, cognitive, and social reality on an ongoing basis. As a human species we live in a world mostly composed of our own collective inventions and our adaptations of the planetary ecosystem we live on. An ongoing and pervasive utility of inventiveness and discovery at every level is a product of our individual and collective imagination over time. Our imagination enables us to create pictures of possibilities which do not yet exist, and to invent the means to transform those possibilities into a material reality. It is in this context that I assert that we have historically and continue now and will, into the future, imagine our reality.

First, I will introduce a biological functioning of the imagination. As I have stated, there are three dimensions in the brain – the epigenetic, the chemical, and the neuronal electromagnetic. In this thesis my primary focus is on the neuronal dimension. However to briefly digress, the epigenetic dimension, provides genetic functions, as DNA (deoxyribonucleic acids) are transferred into RNA (ribonucleic acids) permitting small sequences of RNA coding to pass into the neuronal system. Initially researchers such as Dawkins, thought that the human genome might pre-determine the biological life of the human organism. Indeed, our make-up as a human species is largely pre-determined. At the same time it is important to acknowledge that at all stages of human life each individual is unique. No two genetic codes are exactly the same – even with identical twins. With on-going research, an understanding of epigenetic function is
changing, and the epigenetic function is now considered to provide biological pre-disposition. This means that adaptation also forms a part of epigenetic function. Adaptation involves selection, and for selection to take place there must be alternatives, even at the protein code level.

It has now been established that there are at least fifteen hundred distinct proteins employed for synaptic coding. (Neuron, S. Grant 2014) It is my view, confirmed separately by Changeux and Llinas that biological substrates of the imagination provide these alternatives. This also happens with other aspects of biological brain function. By biological brain function I refer to the embodied brain, and the physical functions of the human organism. In a sense the imagination has a chemical and epigenetic dimension, a difficult concept when one is familiar with the imagination as cognition only. This may help in establishing that the imagination is not entirely a cognitive process associated with consciousness. Tooby and Cosmides state that:

Natural selection retained neural structures on the basis of their ability to create adaptively organized relationships between information and behaviour, or between information and physiology. Thus, it is the information-processing structure of the human psychological architecture that has been functionally organized by natural selection, and the neural structures and processes have been organized insofar as they physically realize this cognitive organization. Brains exist and have the structure that they do because of the computational requirements imposed by selection on our ancestors. (184)

To optimize biological survival, the imagination of necessity engages with reality. We survive (or not) in the real world.
Movement provides an example of the functionality of the biological imagination. Movement occurs within the body and the body’s internal spatial relationship, and it occurs in movement of the body in relation to external space. They both deal constantly with selectivity, as well as with patterns and composition, and therefore engage constantly with imaginative brain function. This aspect of biological imagining I describe as the tactile imagination – that aspect of the biological imagination closely associated with the sense of touch, and it is largely non-conscious. Touch imaginatively engages physical contact with the material world, the sensations of touch, hot and cold, pleasure and pain, movement, animation, and proprioceptive and kinaesthetic space – both practical and imagined. With reference to the dance research described earlier, there seems to be a connection between what I describe as the tactile imagination, and what dance practitioners refer to as the mirror neuron system. I provide in-depth analysis of this foundational aspect of imaginative function in subsequent chapters, as I deal with proprioception and kinaesthetics in practice.

When I refer to the ‘biological’ or ‘tactile’ imagination I am referring to different aspects of systemic imaginative function only. This same theoretical model is used with memory, when memory is referred to as short-term memory, procedural, long-term, working memory, attention, and more. They are all functional aspects of the memory system. A similar reference to aspects of imaginative function also exists. The tactile imagination engages with the senses, emotion, and memory, associated with the sense of touch, from the literal to the abstract.

In recognition of the dual nature of the imagination, the other dimension of imaginative brain function is involved with consciousness, and I refer to this aspect of imaginative functioning as the existential imagination. By existential I mean the imagination in relation to our awareness of our existence – our sense of self. The biological and the existential are not
separated functions, and they both operate on a non-conscious and conscious level. I have described this aspect of imagining, as it relates to creative practice, as holographic, or multi-dimensional, related to the notion of space/time and altered perceptual states.

What is an altered perceptual state? Time, as perceived in nature, usually has a cyclical dimension, as in night and day, the seasons, annual and life cycles. The moment to moment passage of time was measured initially by the movement of the earth in relation to the sun. Later this was replicated mechanically, based on arithmetic principles of equal divisions of time. Our perception of time is based on this human construct. In *Perceiving Two Levels of the Flow of Time*, Gruber et al state that: “There is an upper level [cyclical] flow of time, the phenomenon of past/present/future; and there is a lower level [measured] flow of time which is really a flow of (discrete) events… The illusory percepts of object persistence and perceptual completion can account for the entire flow of time” (17). To illustrate the notion of an altered perceptual state, and at the same time to indicate the engagement of the imagination to shape our reality, I will describe an example of an altered perception of time.

A downhill ski racer experiences present time very differently during a race. The ski racer can travel at speeds of 125 kilometers an hour. How is it possible to make all of the adjustments necessary to maintain control, respond to changing conditions, maximize speed, and stay focused? This is accomplished because the skier experiences the race in slow motion. “Time slows down. If I had to define it, time simply slows down ... and that the awesome power of the brain starts to come forward in speed sports and it starts to redefine time” (51). This is taken from an interview conducted by Dr. Gustav Weder with an Olympic champion downhill ski racer (unnamed) appearing in *Moments of Excellence in a Speed Sport – Interview with a Speed Skier,*
Journal of Excellence, issue 13, 2009. This state is referred to by Weder, himself an Olympic champion in bobsleigh, as being in the zone or flow. The Olympic skier describes it this way:

So much chaos is happening that you can get sucked into the chaos and get consumed by it. And at the same time, you are in such a quiet state mentally that, if you are in the zone, you are simply in that magic moment. You think it lasts forever. You know chaos surrounds the zone. It is a definition of peak performance. (47)

His imagination alters his perception of time. Physically, he is travelling at enormous speed, and physically all of his adjustments are made at that speed, and this is a conscious reality, but perceptually all of this is happening in slow motion. Maintaining both altered state time and ‘objective’ time simultaneously in consciousness can only happen, I assert, because of imaginative brain function. Jim Taylor, psychologist, states in his book entitled Prime Ski Racing: Triumph of the Racer’s Mind, that: “Also, time seems to slow down, enabling you to react more quickly. I’ve heard World Cup racers say that when they are skiing well, everything seems to be moving in slow motion” (5). Time becomes elastic. Similar experiences of time slowing down have also been described by those experiencing traumatic events. (LeDoux et a

Fear 2873)

The ability to anticipate, experience a heightened sensual reality, and alter perception may also take place in a variety of circumstances, outside of traumatic or extraordinary physical events. It can be argued that this is an outcome of internal chemical stimulation, related to increased levels of adrenalin. However, from my readings, there is no clinical evidence of this altered time phenomenon being simply a result of chemical stimulation. I have acknowledged that the imagination is an interactive system in the brain, and chemical changes commonly
interact with perception, emotion, and kinesthetics. As the study of the brain, supported by increasingly sensitive technology, develops in sophistication, there is a growing acknowledgement that brain function exists systemically and interactively, and adapts itself to demands at different levels of activity. So, for instance we know that there is a relation between physical co-ordination patterns, the perception of graphic patterns in our environment, and the ability to grasp abstract mathematical patterns (Fauconnier et al. 122).

These anticipatory, heightened sensual responses are altered state functions of the imagination and they have definite implications in a study of the creative process. For the actor, being fully conscious of engaging in the role being enacted, while simultaneously and interactively being aware and responsive to audience reception is an altered state imaginative process analogous in many ways to the experience of the skier.

As I will present in this thesis, in my view, an important aspect of imagining in creative practice is altering perception. Altered perceptual states employing a cognitive reversal in which reason supports the imagination, enabling a discovery experience to be sustained forms an essential part of creative practice. I refer to this altered state as identification. A definition of the notion of the existential imagination associated with identification will be constructed by providing descriptions of specific modalities, such as altered states, a spatial notion of time, and multiple perspectives.

From my practice and from my science-based readings I have developed observations about the imagination as brain function specifically with reference to a notion of inventiveness in creative practice. This is one aspect of the compositional functionality of the imagination. In this context I contend that the imagination as brain function is not only connected to the senses, but is also connected to emotion, the memory system, and the senses. These systemic functions are
engaged with, and support the imaginative process in the composition of associative imagery. Associative imagery is metaphor as a cognitive, and not a literary process. These brain systems also combine with imagination in a development of creative outcomes. These three systems—imagination, emotions, and memory, while autonomous, are also integrated in a ‘mental workspace’ to engage in the creative process.

As a brain system, the imagination functions fluidly on both a non-conscious and conscious level. To clarify the notion of aspects of brain function; as an example, emotion, memory, and imagination may be engaged in the composition of a choreographic sequence, a speech act, a dream, possible future scenarios, active responses to direct stimuli from the senses, conscious choices, and other cognitive activities. In this example I am delineating different levels of brain activity—imagination, emotion, and memory are complex multi-functional autonomous systems in the brain, and a dream, choreographic sequence, a speech act, or a conscious choice are specific cognitive and behavioral outcomes resulting from the engagement of those functions. Systems like memory, emotion, and imagination are highly adaptable and associate with, and produce many types of behavioral outcomes on different levels of cognitive activity. In an article by Alexander Schlegel et al, they state that:

The conscious manipulation of mental representations is central to many creative and uniquely human abilities… Here, multivariate pattern analysis of functional MRI data reveals a widespread neural network that performs specific mental manipulations on the contents of visual imagery. Evolving patterns of neural activity within this mental workspace track the sequence of informational transformations carried out by these manipulations. The network switches
between distinct connectivity profiles as representations are maintained or manipulated. (16277)

This highly flexible mental workspace network, which I denote as imagination, is described thus:

Scholars theorize that these abilities [e.g. artistic, scientific, and mathematical thought] require conscious experience as realized in a widespread neural network, or “mental workspace,” that represents and manipulates images, symbols, and other mental constructs across a variety of domains. Evidence for such a complex, interconnected network has been difficult to produce with current techniques that mainly study brain activity in isolation and are insensitive to distributed informational processes. The present work takes advantage of emerging techniques in network and information analysis to provide empirical support for such a widespread and interconnected information processing network in the brain that supports the manipulation of visual imagery. (16277)

My reading of this article’s findings confirms my proposal that the imagination is connected to the senses, emotion, and memory networks, both directly in perception, and representationally in the development of visual imagery. It also establishes a systemic interconnection with memory and, I suggest, with emotion. They conclude that:

Human cognition is distinguished by the flexibility with which mental representations can be constructed and manipulated to generate novel ideas and actions. Dehaene\textsuperscript{14} and others have proposed that this ability is a key role of a global neuronal workspace that in part realizes our conscious experience. Here we

have shown that patterns of activity in just such a distributed neuronal network mediate the flexible recombination of mental images. Although the present study was limited to visual imagery, we anticipate that this network is part of a more general workspace in the human brain in which core conscious processes in frontal and parietal areas recruit specialized subdomains for specific mental operations. Understanding the neural basis of this workspace could reveal common processes central to the flexible cognitive abilities that characterize our species. (16281)

Kosslyn’s analysis of visual perception and visual representation, as referenced earlier, reveal another facet of the visualization to perception network, engaging the imagination directly with the senses – especially in visual transformation situations, an anticipatory process.

What might the role of the imagination be in anticipated perception? How does this associate with the imagination as our principal pattern processor? This enquiry about the imagination engaged in our perception of reality, by connecting the imagination to the senses is a departure from traditional understanding about the imagination as an interior function not associated with sensual input. This aspect of imaginative function, referred to as fantasy, is considered to be disassociated from the senses, since its principal manifestation occurs while dreaming, which primarily takes place during a non-conscious state. In my view this disassociation is not entirely evident. My assertion is that it can be directly derived from the senses, as well as derived from aspects of memory and emotion via sensual experience. The imagination, as ‘mental workspace’ then represents, and transforms all of this input as patterns of associative imagery, or metaphor. More recently, in a chapter entitled Mental Imagery, in the Handbook of Neuroscience and Behavioral Science 2009, as a result of ongoing research,
Kosslyn et al have concluded that: “... researchers agree that most of the neural processes underlying like-modality perception are also used in imagery, and imagery in many ways can “stand in” for (re-present, if you will) a perceptual stimulus or situation. Imagery can not only engage the motor [and visual and auditory] system, but also can engage the autonomic and limbic systems” (392). Kosslyn’s work anticipated my research readings in neural re-use theory, and in the connections between perception, memory, and emotion.

Damasio, as stated earlier, enabled me to develop my imagination research puzzle, especially as it relates to consciousness and its connection to emotion and memory, through an interpretation of his findings. In my view, Damasio’s research backs up my analysis of the conscious and non-conscious aspects of the imagination. The connection between imagination and the senses is also re-enforced: “In other words the brain can simulate, within somatosensing regions, certain body states, as if they were occurring; and because our perception of any body state is rooted in the body maps of the somatosensing regions, we perceive the body state as actually occurring even if it is not” (Self 109). Damasio establishes that an important aspect of cognition, both conscious and non-conscious, is image/pattern related. Images are not only visual, but engage all of our sensual communication possibilities. This process initiated my recognition of compelling, or stimulating images – non-conscious images that become arousing, disturbing or compelling enough to reach consciousness. It also establishes that there is no barrier between consciousness and non-consciousness.

My definition of the imagination as patterns of possibilities, from the work of Modell, identified the imagination as central to systemic brain functions, by providing ‘alternatives’. This is supported by Changeux, Changeux, and Ricoeur, and Rodolfo Llinas. Changeux states, in *Neuronal Man* that: “… this recombining activity represents a *generator of hypotheses*, a
mechanism of diversification essential to the genesis of pre-representations and subsequent selection of new concepts. In a word, it forms the substrate of the imagination” (233). Llinas goes on to describe how: “…spatial mapping creates a finite universe of possible representations [via the imagination], in which a categorization is achieved by the superposition of spatial and temporal mapping via thalamocortical resonant iteration. It is the temporospatial dialogue between the thalamus and the cortex that generates subjectivity” (66).

With regards to an existential notion of imagination, Modell introduced the notion of metaphor, which I refer to as compelling images. With further enquiry I began to understand that metaphors are associative patterns, initiating my consideration of imaginative pattern processing, not only on the physical level, but also, connected with emotion and memory, to emerge into consciousness, which I came to consider as being the existential imagination. This multi-level notion of the imagination was reinforced by the theory of neural re-use as undertaken by Anderson.

This advanced my theory of the imagination as associative pattern processor, as well as furthering the association between imagination, the senses, memory, and emotion. LeDoux provided an overview of the neuronal system. One of the most important aspects of his research into the imagination is a clear understanding that the imagination is absolutely central to our perception of reality, furthering my understanding that subjective reality is an imaginative construct. Additional texts served as references for details about various models of brain function. This view influenced my approach by characterizing it as also being able to derive a set of principles from my observation and my reading, as well as through hard scientific evidence.

An altered perceptual state involves a cognitive reversal, at the conscious level, in which conscious cognition, or reason, supports the imagination, in the act of creation. Most of the time
the imagination supports conscious cognition in the ongoing composition of reality, by enabling choice through the provision of possibilities and alternatives. To reverse this process, a state of not-knowing and a suspension of judgement must be initiated and sustained to enable creation. This permits a fluidity between non-conscious and conscious processing to enable compelling images to become visible. These images do not need to be visual, they can also be tactile, auditory, and olfactory/gustatory, or any combination thereof. Lakoff and Johnson relate metaphor to the functioning of the imagination itself. Byrne introduces the imagination of possibilities. All of these works cemented connections with my observations of training practice, and developed my understanding of the nature of the imagination further. From the combination of my reading, post-graduate research, and my experience, I posited that rational and abstract thought are dependent on the imagination, and the imagination employs metaphor as a means of expression. Therefore metaphor forms a basis for our embodied cultural expression, and the creation of compelling (stimulating) imagery is central to the creative process.

The imagination connects with the senses, and other mental activities, but it remains the imagination as systemic brain function with all of them. Aspects of the imagination system are being identified, such as the tactile and existential imagination, and a mental workspace network. This is similar to the identification of aspects of the memory system in neuroscience and cognitive science, which is now well established. Imagination as a complex system is pre-disposed to engage with both memory and emotion, in the production of mental activities, such as creating new work for the theatre. The distinction between sources and outcomes supports my three systemic functions of the imagination – the development of possibilities/alternatives, engaging in associative pattern processing, and the composition of imagery through metaphor, and provides a means to associate them with a three-stage development central to my creative
training practice – identification, transference and transformation.

My view of imaginative brain function, drawn empirically from my work training professional artists to produce original work for the physical theatre is approaching the imagination from the outside – or from empirical study. These observations are drawn as impressions I developed, supported by the notes I took while a student at the Ecole Internationale de Theatre Jacques Lecoq in Paris\(^ {15}\), France between 1971 – 73, and then from 1989 – 90 when I was a teaching associate at his School, as well as from my own teaching notes collected and retained on a weekly basis during the training process undertaken at my own School of Physical Theatre in Toronto Canada between 1978 and 1998 and in London U.K. between 1998 and 2008.

In addition, I have drawn from a series of documentary video presentations made while I was teaching the neutral mask in 2006, entitled *Neutral Mask: a Foundation for the Theatrical Experience*, edited and marketed by Contemporary Arts Media, London U.K. and Melbourne Australia, together with my training booklet *Moving Images: Experiential Learning and the Physical Theatre*, also published by the same company in March 2000\(^ {16}\). The observations I present to support my principles of imaginative brain function are drawn from all of these sources as an aide memoire to support the observations I present as a summary of my pedagogical experiences training professional creator/performers. I draw upon a training pedagogy grounded in the work of Jacques Lecoq, in which I trained over eight hundred

\(^{15}\) The Ecole Internationale de Theatre Jacques Lecoq is located in Paris, France. It has operated as an independent school since 1956, and trains theatre professionals in developing creations as creator/performers for a genre of theatre known as physical theatre. Following Jacques Lecoq’s death in 1999, the school changed substantially, so my references concern the school pedagogy during that period in which Lecoq ran the school himself.

professional theatre artists over the age of eighteen, drawn from twenty-eight different countries, over a thirty year period, to create original work in their own creative practice for a career in the theatre, as well as expanding into other media.

The foundation for the development of original work at the Lecoq School as well as in my own academy, involved a three-stage process, referred to as: identification, transference, and transformation. These three concepts can be defined as follows:

**Identification**

Identification relates identity, a sense of self, with recognition, a modeling of the outside world, through embodiment as a response combining the sense of self and the modeling of the world together. Lecoq states, in his book on his pedagogy *Le Corps Poetique* (The Moving Body), that: “Through teaching I have discovered that the body knows things about which the mind is ignorant” (9) and: “The interior world is revealed through a process of reaction to the provocations of the world outside” (30). Identification requires a state of mind which I describe as suspense, a sense of not knowing or a suspension of judgment, an engagement and readiness. This state of ‘not-knowing’ is an altered state of mind in which cognition supports the imagination – a cognitive reversal. Modell states that: “Identifying with the other rests on a paradox – that one is similar to the other yet one remains oneself. One must be able to accept the paradox of something that both is and is not” (176).

The imagination in creative practice provides compelling images which can be disturbing, violent, and frightening. The creative imagination is not ‘comfortable’. Compelling images are often unanticipated, shocking and deeply unsettling, or stimulating, as they stimulate the individual to respond. Since, in my view imagining is patterned, many levels of non-
conscious and conscious processing are engaged at the same time, and since perceiving is image-based it happens very quickly in this manner. This image-making and associative mapping process is the act of placing one’s self in some relationship to something. This act not only makes the object/subject visible, but the viewer also becomes visible in relation to it. One recognizes one’s self when one recognizes the other, via a ‘mirroring’ process of the imagination. By reflecting a sense of self in relation to the compelling image in this manner, each artist develops a unique style, or signature.

**Transference**

The transference of compelling images into a narrative or sequential associative structure requires a discharge of emotional and creative energy to commit to one’s creative process. This transference of creative energy happens by means of a conscious interface with non-conscious stimulation, together with engaging the skills and experience of the creator, in developing compelling imagery into an open-ended, embodied narrative structure.

This process exists on three levels, the physical – relating the imagery to a space, the presentational – the compelling image compels a response, and the metaphorical in which the imagery extends ripples of meaning beyond its principal stimulus. Transference also involves the ability to transfer experiences from one domain into another, so principles discovered while exploring a mask for example, are transferred into the creation of original pieces disconnected from the mask work itself. Images and ideas are transferred into physical choreography in a theatrical space. Modell states that: “… the definition of metaphor [is] the transfer of meaning between dissimilar domains…” (41).
The movement between identification and transference is active and willful. This process is not volitional, but compelling enough to demand some transferrable process. The form is dictated by the nature and context of the discovery itself. This is necessitated by an altered perceptual state, in which cognitive processes support the imagination, and it is embodied.

**Transformation**

When developmental neuro-plasticity connects systemically over time, a transformative experience occurs. Neuro-plastic pathways become embodied procedural and working memory. This is described as engaging craft, skills, and experience to support the creative imagination at all levels of activity. Grounding learning development as an embodied experiential process, through improvisation, provides a foundation flexible and adaptable enough to engage productively with the imagination in transference, as creative practice. When transformation takes place the creation matures, to stand on its own. Imagined possibilities are transformed into physical, and virtual realities. Modell states that: “… the difference between a metaphoric process that merely transfers meaning and a metaphoric process that transforms meaning can be attributed to the contextual complexity that has been added to perception” (147-48). Development, once a piece is conceived, becomes interpretive. Transcending its own formation, the creation becomes more than the sum of its parts. When discoveries and creations resonate, they acquire additional significance.

---

17 Modell’s work, as referenced here in *The Imagination and the Meaningful Brain* employs research connected to cognitive psychology, since he is a Freudian psychologist, but I have re-interpreted this reference somewhat to engage in the creative process more specifically, without distorting his intent.
These three stages in the creative process form a foundation for my exploration of the tactile and existential imagination in my creative practice. I propose that the three stages in creative development have a correspondence in the three aspects of imaginative brain function, alternatives and possibilities associate with identifications, pattern development associates with transferences, and composition associates with transformations. This embodied process originally developed by Lecoq, has a built in adaptability.

Since, as I have shown, imaginative functions are integrative with other aspects of brain function – emotion, memory, and the senses, they develop systemically in the brain. This enables an integrative training process with specific structures developed to respond to these embodied brain functions. It also posits that this is not simply an inherent ‘natural’ ability, but these altered states are instead a resource that can be developed, and indeed require training and situational opportunities to flourish.

In this thesis I present a theatrical pedagogy specifically focused on the creator/practitioner developing original work for the theatre. To replace cultural content, the program focuses on essentials of the process itself. The emphasis is on the engagement and development of an embodied imagination in the discovery of a theatrical voice for the artist, exploring originality, and establishing a personal theatrical style. I learned and discovered these principles of imaginative functioning while I taught. Based on this foundation, I provide a summary of my analysis of specific aspects of my training process, related to the imagination as brain function.

The focus of one aspect of my training centres on a physical grounding through movement, skill development, and acrobatics. This is the development of a tactile aspect of the imagination, and involves a study of movement within the body, or proprioception, and
movement in relation to the outside world, or kinesthetics. Wong states, in *On the Multimodality of Body Perception in Action* that:

> Proprioception provides us with the relative position and movement of body parts. However, the receptors it draws on provide information only about muscle stretch, tendon tension, and joint angles. Without metric [kinaesthetic] information about one’s body part, proprioception would be unable to map input from these receptors to body part position. Thus, there needs to be an implicit body model carrying metric information about the body, which serves as a reference for proprioception and touch. (130)

An implicit body model, in my view, includes imaginative functionality, as well as kinaesthetic input. Therefore, proprioceptive and kinaesthetic brain/body functionality, while each providing specific movement and positional parameters, work together to provide an embodied movement perception.

In training, physical skill development cannot be separated from the development of the tactile imagination, and in this genre of theatre, physical performance cannot be separated from creation. Principles and skills derived from movement studies are transferred into original creations via the imagination as mental workspace. The tactile and existential imagination work together through the medium of improvisation.

The other aspect of this training process involved the discovery of principles of creation and performance acquired through improvisation and weekly presentations of the trainees’ own work based on given themes, in a creative dialogue. What follows is a series of observations developed while responding to these performances and improvisations. The pedagogical structure employed the concepts of identification, transference and transformation as described
earlier. The observations themselves are related in general terms, as they emerged gradually during my teaching career as discoveries and insights whose immediate purpose was to improve my teaching methods in response to trainees’ experiences.

**Observations**

The moment a participant becomes critical - says no internally to an image, perhaps because it may be embarrassing, in effect censoring herself; imaginative engagement stops, and the improvisation stops, usually quite abruptly. This became practical evidence of the need for a sustained perceptual reversal, where the critical faculty supported the active imagination, without interference. If the participant shifts into linear thinking – by making a choice, the imagination as a patterning function, based on my observations, doesn't seem to consciously connect with a linear mental configuration. This connects with the notion of the imagination as pattern processor. It became extremely difficult to invent possibilities and alternatives when ‘no’ was a part of the process. Even saying yes by consciously consenting seemed problematic, as I gathered from listening to trainee responses to their own experiences, as it placed the critical function as the ‘gate-keeper’ of the imagination. Only when the individual relinquishes this control does the imagination seem to readily respond, and a genuine spontaneity emerges. It also provided some experiential evidence for considering the imagination as non-conscious brain function.

Another observation I acquired is that the images are entirely embodied as they are created by corporeal engagement. In a sense, the body, in contact with the image, reveals each image to the participant only after it has already manifested itself. Any pre-arranged script is forgotten once the improvisation is engaged, or the images become routine and lifeless as there
seem to be no surprises, since everything has been pre-planned. This became a compelling observation of the need to maintain a sense of discovery and ‘first-time’, even if the ‘script’ is rehearsed. Hence, I discovered over time that the participant needs to remain on an energy level of suspension/calm so that each image takes its own time, or the imagined images begin to speed up, and the individual appears to be continually trying to catch up to their own imagination. When this happens images and physical engagement are frequently dropped to latch on to the next image. The imagination seems to be searching for an image the participant can hold onto – a compelling image, but only if the participant remains entirely in the present moment. I also became aware that the imagination is extremely fast as an image processor.

Another aspect of this analysis of practice I discovered when trainees permitted the image to be physically present and remained engaged by interacting with it, to maintain a direct physical and emotional relationship with the imagination. If this was lost the improvisation or presentation became private, invisible, and the participant became a passive spectator to their own imagination. In this way I discovered that the imagination engages all of the senses - it is sensual and it is active. An attempt to ‘appreciate’ one’s own imagination eliminates any suspense, by distancing the participant from himself.

I also discovered that maintaining ownership of one’s imagination is crucial to the creative process. The imagery provided by the imagination may be surprising, even shocking. At times it appears as if the imagination is attempting to surprise the individual out of their complacency or resistance. To me this was the imagination functioning to stimulate the individual into complete engagement in the present moment non-consciously in a supportive manner. Often the more the individual resists, the more the images become ‘extreme’, and a kind of struggle emerges. From these experiences I concluded that, functionally, the imagination is
entirely supportive of the whole organism – not simply the conscious part, and seeks to provide an individual with what they need to go further creatively instead of what they want to remain ‘comfortable’ with their creation.

Many of these observations re-occurred in many different improvisations, while exploring masks, animals, material imagery, as well as characters, puppetry, and poetic or musical material. The relationship to the imagination seemed to become embedded in non-conscious and conscious memory.

Improvisation also engages much deeper feelings than may be initially apparent. Emotional memory is re-awakened, and awakened emotional images go on, connected with the imagination. Gradually a dynamic relationship between emotion, memory, and imagination was revealed. It became evident in improvisations when one participant attempted to control the responses of the others, as the suspense in play was lost. They gradually learned to be completely honest with their imagination and each other.

Imagination and resistance as a creative combination became important in creating new material. It formed a part of the process of identification. The creative imagination was being more and more engaged and participants developed an imaginative malleability, as well as permitting spontaneous engagement of the body in response to theatrical imagery. The transference of studies, explorations, and discoveries cumulatively encountered during improvisations was re-emerging in creations by being transformed into original material. They were not interpreting, nor was it an opportunity to become unfocused, but instead it became an important development in trusting physical perception and non-linear schematic intelligence through the imagination. They trusted their imagination, and were unafraid to follow it without knowing where it will lead first. The invisible was becoming visible.
As described earlier, I made my classroom observations prior to undertaking this study, and they came about entirely as a result of my teaching. I became more engaged by my initial reading in neuroscience only towards the end of that aspect of my professional teaching career. In addition, I have been relating the imagination to a specific task – creating material for theatrical presentation. The nature of the type of theatre I refer to is popularly called ‘physical theatre’. It is image based, instead of being based on a written performance text, allowing the focus of the presentation to remain primarily on visual and choreographic performance. In this context, physical theatre may be described as having certain individual characteristics, while also remaining allied to many theatrical styles, including comedic performance, clown, tragedy, satire, and melodrama. Physical theatre is a useful base for this type of embodied training, as it is not anchored in one language, or one cultural tradition, so it retains a flexibility in concert with a multi-cultural and multi-lingual student clientele.

By taking the insight derived from my reading and relating it to my pedagogical observations, I have constructed this article on the nature of the imagination as brain function, by reflecting on ways that this training methodology has been developed to stimulate the creating of new material for presentation. Subsequent to my teaching practice, I have endeavored to relate these ideas to creative practice on a wider basis. I will now provide some conclusions drawn from my observations about the imagination as brain function with reference to a notion of inventiveness and creativity.

Conclusions

What I present here is not a comprehensive understanding of imaginative function, as such an understanding does not yet exist, but instead I have presented a science-based analysis of
imaginative function, with an accompanying analysis of applications in creative practice. The observations of practice are drawn from a retrospective accumulation of evidence from a large number of artists in training, and the science-based principles are assembled from a broad segment of related readings in cognitive science and neuroscience.

These understandings and observations have formed the basis for a set of principles about the imagination and creative practice. These principles include: The imagination as brain function is employed in the creative process to embed creation as a skill in procedural, implicit, spatial, and working memory. It is then re-used in transference as it engages in the development of the participants’ own work. The reversal of cognition, allowing perception to support the imagination is essential to permit the creative process to occur, as my observations have demonstrated. It is embodied through a connection to the theatrical/metaphorical space. The pedagogical trajectory of the creative process is identification, transference and transformation. Imaginative brain function consists of possibilities, patterns and composition.

The imagination is grounded in the body. Each trainee develops physically, and certainly they develop skills, but the focus of my training program is each individual’s imagination in creative practice. I propose that one of the requirements of the imagination, in the act of creating, is stimulation. Images or ideas become compelling, in that, they stimulate a response – an active engagement. In my experience creating is not a comfortable endeavor. Calmness is not the same as comfort. We create imagery out of experience, the experience of the senses in contact with the physical world, and we create art out of imagery. This is the process, in experiential terms of transferral and transformation. Discovery through identification is the ground of our imaginative being and a basis of our adaptability and development.
In this study I also address the question: can the imagination be developed, and can the
creative imagination be educated? I believe that I have answered that question. In the twenty-first
century, the creative process has become the principle asset of our existence. The promise of the
imagination is that it permits one to perceive that which is not evident, to know the unknown,
and to reveal the invisible. I have posited in my enquiry that training can be a careful and deeply
considered development of the tactile and existential imagination for the purpose of creation. The
intent of my presentation of this material has been to take improvisational training processes
focused specifically on the development of creators of original material for the theatre and open
them up to creators and innovators in other fields, by establishing a set of adaptable principles
about the nature of the creative imagination in practice. My ongoing engagement with the
academic and training communities will serve to test these principles. Improvisation as a medium
has, in my view, a close connection to imaginative brain function in the development of creative
practice. My intention is to stimulate further research and development into the process of
training the imagination to engage in creative practice.
In this chapter and in chapter four I will investigate specific physical and improvisational training methods employed to develop the practice of creating original work for the theatre. My purpose is to elicit elements related to the engagement of the tactile imagination and the existential imagination as brain function in the practice of creating. They may have wider applications. I consider imagining, an autonomous function of the brain, as a mental source for creating, and creating as a behavioural outcome derived in part from that function. Each creation engages in its own specific processes, I contend that there are practices common to creating in general. In this chapter I demonstrate that, at its source in the imagination as brain function, there may be certain processes common to most creative endeavors. In addition, I argue that creating, as an outcome, is trainable.

In my view there is a difference between creating and inventing. Creating, in the context of this investigation, focuses on the development of new works of art and craft, and I consider it as such in this thesis. Inventing involves the development of new technological, and scientific artifacts and methods, which will not be addressed here. Both of these terms commonly have been interchangeably, as well as being used with reference to innovation, and are often employed descriptively in a social and professional context. These terms may also be implied with reference to discoveries, and ingenuity. Therefore, the use of the term creation may result in a level of confusion. The Oxford English Dictionary definition of creation is: “The action or process of bringing something into existence” and “A thing which has been made or invented, especially something showing artistic talent.” If it is the act of bringing something into existence, then this can be claimed with regards to many activities, involving discovery, invention,
innovation, and creation. Consequently I am limiting my enquiry to training methods associated with creating in an artistic context.

In my practice as director of a professional theatre training academy, called the School of Physical Theatre, over a thirty year period from 1978 to 2008, I developed and implemented a set of principles about the functioning of the imagination as a foundation for training in creative practice. During this time I trained over 800 original creator/practitioners from around the world. I acknowledge that my observations come primarily from this source. I also draw upon my training and collaboration, between 1971 and 1990, with Jacques Lecoq, in Paris, and I draw upon observations taken from my own experiences as an actor, creator/performer, and director in the professional theatre, where I created and presented 16 original works between 1976 and 1996.

**Training History: Lecoq and the School of Physical Theatre**

I have taught every aspect of the pedagogy I am about to present, from movement training to acrobatics, improvisation and presentation. I have continuously revised my pedagogy so that it responds specifically to the challenges of each group. These incremental revisions involved questioning the efficacy of each element of the program, and judging its merits based on student outcomes. The program was outcome driven, in that the success of each aspect of the curriculum depended upon how well it was utilized as evidenced in the students’ presentations, in discussion, as well as in their careers after completing the training.

I have adapted this training process to many different settings, from short-term courses, professional acting schools, college and university training programs, to my own training facility
on two continents. This points to both the flexibility and adaptability of the training as well as its applicability and relevance in a variety of circumstances.

I have trained creator/practitioners from many different cultural backgrounds, and classes have included a substantial number of participants whose first language is not English. This resulted in the repetition of a lexicon of phrases such as the voyage, a movement study, separations, identification etc., which my students came to understand experientially. Some of these phrases are employed in this chapter. I experienced these same circumstances when I took the training myself in Paris, taught entirely in French, and a number of these phrases originated in French with Lecoq.

This training has always had an aim of being culturally inclusive. As a result, to replace specific cultural content, the program focused on the essentials of the themes themselves. I will provide an example, drawn from parallel curriculum changes in both the Lecoq School and in my own program, to clarify this development.

The Commedia dell’ Arte, or Italian Comedy, employed a set of comic masks, and favoured the experienced actors in the class, as it involved spontaneous improvised comedy with set characters. The commedia was a central theme of the second year at Lecoq’s school in 1972-73.\(^\text{18}^\) The women in the class insisted on playing the masks as well (all of the masked characters had traditionally been introduced as male). Once the characters were no longer gender specific, the comedic play broke away from traditional comic scenarios, or comic play, and began to engage more contemporary themes, and consequently was renamed by Lecoq as the ‘human comedy’. This reference to Balzac remained too culturally specific however, so the content

\(^{18}\) I believe that this had been the case since his school started in 1956.
transformed again, with the help of Philippe Gaulier and his introduction of the derisoire (absurd) clown, into a study of the mask of satire, and the buffoons emerged.

My program underwent a similar transformation, aided by reports about the curricula changes which Lecoq had made which were described to me by returning graduates, as well as my memory of the performances of Dario Fo, and the Theatro Piccolo’s performances in Paris. The comedic masks, performed by both men and women, became an introduction to the mask of satire, and many of the comedic elements were subsumed into the content of this theme.

All of these thematic iterations employ a tactile foundation grounded in the notion of the mask as living metaphor of the relationship between the creator and the theatre, as opposed to employing an historicized cultural context as the basis for their development. In this case the women became the catalyst for change because of their desire for physical empowerment in the process, through playing the ‘male’ masks. The term mask was then replaced by territoire, referring to a theatrical genre. This is an indication of the way the programs evolved – in response to students’ initiatives. This change stimulated research into other traditions, including an example of the Italian comedy in which female characters predominated, into traditions of the bouffonesque and satirical in several cultures, as well as employing references to parallel traditions in south-east Asia with the Balinese comic masks based on the family, the Chinese opera with the acrobatic tradition of the monkey-king operas, and Japanese cultural traditions with the entr’acte satirical stand-up performances in the Kabuki theatre.

19 This tradition was about Ruzante, in which the female character Betia, a Mother Courage character, dominated. One of the manuscripts surviving from this tradition is a play called La Moscheta (The Mosquito).
20 I managed to see a number of these productions presented by practitioners from these various cultures, while resident in London and Paris.
Stimulation was also drawn from silent film, cabaret, and the stage clown. Lecoq edited another lesser known text in 1987 which outlines many of the theatrical sources of his pedagogy, available only in French, entitled *Le Theatre du Geste: Mimes et Acteurs*, in which he described in both text and photographs, sources that inspired his work. Students arriving from diverse cultures also contributed their knowledge and experiences to this development, especially in the realm of politicization.

The improvisational themes, based on the mask of satire – the *boufon*, were then continually refined and augmented in practice. Improvisation was both a pedagogical and experiential tool for theatrical research. There was never an attempt to re-produce any traditional styles in their historical context, but instead images and ideas were employed to re-invent the genre in a contemporary form, maintaining a ‘spirit’ of the original.21

Each theatrical exploration was not grounded in historical anthropology or the literature of the genre. Instead, in my own program, and I believe in Lecoq’s as well, it was grounded in the imagination. The purpose was to encourage new work from a contemporary context, not to re-produce a classic from the past. The work developed in both of our training programs was not text based, and the purpose was not acting training. This transformational process of the commedia had initially been resisted by Lecoq, who was an authority on the traditional commedia dell’arte, having worked as a researcher, and then a coach for the Teatro Piccolo, after WWII, between 1948 and 1956.22

______________________________

21 By spirit, I mean something essential about the genre in a theatrical context. In the commedia it was the improvised nature of the satirical comedy.

22 Lecoq loved the commedia, but had few qualms in giving it up pedagogically, and we all witnessed this.
Instead, he was persuaded by the women’s engagement with the masks, and probably through his prior experience at the Theatre Piccolo, whose stated aim was to re-invent the commedia in a contemporary context. This impetus had led to his work with Dario Fo and Franco Parenti on a set of satirical pieces, and twenty years later to the mask of satire (Lecoq, Moving Body 8). All of the traditions he had encountered were transformed into his major ‘territoires’ used as a basis for the training process at his school. “Only by going beyond the frontiers, passing from one territory to another and overlapping them, can true creativity be nurtured and new territories come to light” (162). I learned this transformative process from him directly, as well as working with and observing a number of his contemporaries as guest practitioners at the school, who had embodied this process in their own work, from Dario Fo, to Ariane Mnouchkine, to Peter Brook.

This creative trajectory led to my focus on the imagination in creative practice. I continued to remain in contact with Lecoq through working with his Canadian graduates, including Harro Maskow, Martha Ross, Robin Patterson, Wendy Gorling, and Dean Gilmore. There were also periodic visits to Paris and workshops, and I worked again directly with Lecoq as a pedagogical associate in 1989-90, as well as training at the Laboratoire d’Etudes du Mouvement, design and animation program at his school with Krikor Belekian, and Pascale Lecoq.

The Lecoq program had three first year classes of approximately thirty students each, of which two sections were taught in the morning, and one in the afternoon. The second year group, of approximately thirty students was also taught in the afternoon. Second year students were selected by all of the instructors from the group of approximately ninety first year students, and
were then informed about acceptance into the second year in interviews conducted in the final term of their first year.

Classes consisted of one hour of movement training, a second hour of technique three days, and acrobatics two days per week. While I attended the school, movement was taught by Monica Pagneault, technique was split between Lecoq and Pagneault, acrobatics was with Pierre Byland, and one and one half hours of improvisation were undertaken by Lecoq, or Byland, as well as Philippe Gaulier. Every Friday students presented their own pieces in class, with all of the instructors present, developed in groups during the week, outside class. There were three public showcases, one at the end of each term. The audience was mainly theatre professionals and alumni from Paris. These were presented by the second year students. Classes ran from mid-October to mid-December (term 1), mid-January to the end of March (term 2) and mid-April to the end of June (term 3) for a total of twenty-eight weeks.

In London, U.K. my school was modified as a one-year intensive full-time course, presented in three terms over a ten month period (total 36 weeks). Classes were held Monday through Friday. Groups averaged between twenty and twenty-five students, usually evenly split between men and women. The School was certified to accept foreign students by the British Government, and approximately two-thirds of the students came from outside the U.K. When I operated the program in Toronto, Canada over a twenty year period, it was a two-year program, operating over seven months in two spaces, with a similar schedule of classes and student composition, with twenty to twenty-five students spread over two years, and an average age of twenty-three.

23 A complete description of the school in London is available at [www.physicaltheatre.com](http://www.physicaltheatre.com).
Classes in London consisted of one hour of movement training daily, a second hour of technique and skill development three days per week, and acrobatics two days per week. There was a two hour class on improvisation Monday through Thursday, and every Friday there was a two hour presentation class. The improvisational themes were structured, and this aspect of the work consisted of undertaking scenarios provided by the instructor. These scenarios ranged between specific narratives which were then interpreted, to thematic undertakings which were more exploratory in nature. With the exploration of the neutral mask the scenarios were very specific, whereas the exploration of a set of satirical masks from Basel in Switzerland, called ‘larval’ masks was not structured. Improvisation was employed to ensure a ‘first-time’ unedited and unrehearsed experience. In this way each student found their own identification with the material being explored, whether this was with a comedic character mask, or a theatrical persona based on the elements.

Each day, Monday through Thursday there were three hours of self-directed rehearsal for students to prepare their own weekly presentations. These were usually developed using improvisational methods. Each week students were given a theme, which they would interpret and develop into a performance, usually in groups, to be presented each Friday. Three times per year the students presented a showcase of their own work for a public audience. They also undertook the development of an original choreographic piece based on a set of twenty movement studies, as well as creating a presentation piece of their own, based on an individual theme provided by the instructors. Each student was entirely responsible for this piece, however they could employ others in their presentation as performers. The first half of the program

---

24 These masks were transformed into the masks of the potato people, presented by Theatre Beyond Words.
25 The theme I was given by Lecoq was ‘a door opens’.
provided a foundation for the entire year, and the second half was an exploration of a series of themes, for the purpose of establishing each individual’s own style preferences.

Although my school employed a similar structure to the Lecoq program, the content and delivery were different. The first year of the Lecoq program, with 90 students, was very pressured and felt like a constant audition to be accepted into the second year. Since I worked with a smaller number of students, my program employed more individual interaction, and was focused specifically on imaginative development for creative practice. I taught the majority of the classes, with the assistance of part-time instructors, and post-graduate teaching apprentices. The success rate of my program was approximately 80% of graduates working in the profession following successful completion of the training. This was high in relation to other schools in part because some students returned to their country of origin where they had an existing support network, and some individuals remained in Toronto or later in London, both having a vibrant theatre scene, to pursue new career opportunities. They often presented their own work, so many students were not dependent on auditioning and being hired by other companies. Some graduates also taught, or formed ensemble companies to work collaboratively on projects. Some became specialists – such as combat stunt choreographers, directors, stage choreographers, writers, puppeteers, mask-makers etc. as well. The school provided a wide spectrum of career opportunities.

Physical Preparation

The focus of this chapter centres on a physical grounding through movement, technique, and acrobatics. This provides a foundation for the tactile aspect of the imagination, and involves a study of movement within the body, or proprioception, and movement in relation to the outside
world, or kinesthetics. It can be argued that this is really the development of skills and expertise; in mimesis, in physical development, and increased movement vocabulary, and therefore is primarily about the performer. Indeed, this is the case, since physical skill development cannot be separated from the development of the tactile imagination, and in this genre, physical performance cannot be separated from creation. This points to a central facet of this thesis as well as a foundational principle of this pedagogy, as practiced in my program. The physical and improvisational work are entirely interconnected and take place concurrently, usually resulting in individuals who are both creators and performers.

The imagination is grounded in the body. Each trainee develops physically, and certainly they develop skills, but the focus of this program is not the actor, it is the imagination in creative practice. The constant and ongoing mapping of both proprioceptive and kinesthetic activities includes possibilities and alternatives before and during physical activity, enabling a close connective and adaptive dialogue between the tactile sense and imaginative brain activity.

The imagination is the generator of patterns, animating possibilities and alternatives to develop multi-dimensional living maps related to all physical activity. One of those dimensions is space/time. It is pattern development because the body is schematic, and its processes are entirely pattern driven. This notion of a patterned imaginative process is engaged directly in improvisation as I shall introduce in chapter four, and may be characterized by an altered perceptual state.

There are logical sequences in patterns, but patterns are activated schematically, and schematic logic cannot be ‘managed’ by conscious executive function. This principle, discovered through experience has been corroborated cognitively by my reading, referenced in chapter four. The body cannot be directed or managed by conscious thought alone. It therefore has a natural
affinity to non-conscious emotional, working and procedural memory, and volitional processing, and a natural connection forms between the body and the imagination. Imagined patterns are readily animated physically.

An excellent example is coordinated movement, in which schematic logic, pattern development and both proprioceptive and kinesthetic properties are all engaged spontaneously, and non-consciously, in a seemingly effortless manner. How much effort would it take to consciously initiate and control every bodily movement? It would take all of one’s attention, and would require an extraordinary mental effort. The movement studies I present in this chapter concentrate on combining physical schematic intelligence with imaginative patterning and composition in the creation of new material. This is assisted by representation and simulation through the activation of memory networks associated with learning.

I will present this analysis, based on my own practice by describing each aspect together with providing observations derived from my research and experience. As I developed curriculum I sought for a deeper understanding of the principles that inform and support the process. This understanding has led me to an analysis of the creative imagination and thence to the imagination as brain function. In this chapter I am now documenting my process as I encountered it, presenting a reflective analysis of my training methods as a means to make relevant observations about the imagination as brain function, focusing on understanding the nature of the imagination in creative practice, as viewed from the ‘outside’. I have found that this pedagogy is, based on my experience, useful in its practical understanding of the nature of the imagining process itself.
Training Practice

My training employs a model which engages both linear and schematic perception in the creation, development, and presentation of theatrical imagery. It is an approach to theatre training which acknowledges the equal importance of narrative, action, and persona in the theatrical space. As Jacques Lecoq states, with regards to his training: “… it is… educating theatre artists of all kinds: authors, directors, scenographers as well as actors” (18). He also states that: “Through teaching I have discovered that the body knows things about which the mind is ignorant” (9). I interpret this comment to relate to imagery that is revealed physically by the non-conscious imagination. Creative impulses emerge from the non-conscious imagination into consciousness. Such images are engaging or disturbing enough that they register consciously. These images are frequently engaged with physically before being acknowledged by a conscious response. They develop into an entirely unanticipated schematic/logical narrative, as surprising to the creator as to those witnessing it. These images are compelling. The emphasis in my training process is on the engagement and development of an embodied imagination in the discovery of a theatrical voice for the artist, exploring originality, and establishing a personal theatrical style.

What I present now in a linear literary way, is itself a schematic process. All of the exercises detailed herein are not being done separately one after the other as laid out here, but concurrently. Participants are engaging in proprioceptive movement development and kinaesthetic embodied analysis, acrobatics, and improvisation on a daily basis, and presenting their own work, in a kind of feedback loop, on a weekly basis. Equally important is the dialogue running throughout this process. Students provide observations on their own experiences, and provide feedback on the others’ experiences as well. They receive observations about the
experience by the instructor, as well as impressions from those witnessing it. It is both a demanding and intensive process, challenging each individual to provide constant active engagement.

Instruction also has an improvisational component, in which the interaction between the instructor and individual participants provides unique pedagogical opportunities, which contributes to imaginative development. Where I have provided specific descriptions, the purpose is to act as a model for an analysis of the engagement of the imagination, and thereafter to illustrate how a possible brain function based analysis might inform this practice. While I am now engaging in an analysis of practice, it is important to remember the three stages of my creative process, as described earlier – identification, transference, and transformation, as they form a foundation for this pedagogy.

**Part 1: Embodiment**

We live in our bodies. Our sense of self, or consciousness, is an embodied sense. Our experience of the world around us via our senses and an awareness of the self is grounded in the body. (Damasio *Self Comes*, 20). Johnson, in *The Body in the Mind*, states that metaphors, or associative imagined patterns: “… are recurring structures of embodied human understanding. They are part of the structure of our network of interrelated meanings, and they give rise to inferential structures in abstract reasoning” (196). Somerville and Decety state that: “… all cognition, including high level conceptual processes, relies heavily on such grounding in either the modalities [senses] or the body” (182).

---

26 Since this book was published Lakoff, a frequent co-author with Johnson, and a cognitive scientist, has developed this notion of image schemata into the idea of ‘framing’ as a basic cognitive process.
The body may be considered as a physical manifestation of personality. Rick Kemp states in his analysis of embodied acting training: “Movement and other physical experiences in the material world are the sources of metaphors that shape our conceptual thought” (12). This statement suggests that imaginative activity is derived through the senses, especially in the context of creating for the actor. Much of the neural circuitry connecting the two hemispheres of the brain are provided via embodiment. McGilchrist, in his work on the interactive relationship of the two hemispheres of the brain *The Master and His Emissary*, recognizes that much of the connective circuitry in the brain is manifested through the body. (16-21). Since the body draws on all of the resources the brain provides, together with its own sensual input, the body is highly intelligent.

As a conscious organic medium the body offers infinite possibilities for play. The enormous variety of body types and conditions enhance the subtlety and contrast with which expressive play may take place. The body is an intelligent individual physical/psychical personality. She or he perceives primarily in two modes - schematically/intuitively, and linearly/deductively, and most importantly, there is also a third way combining both schematic and linear processing in altered state perception. This mode of non-conscious and conscious interface perception is required for embodied learning. A number of the exercises I describe, both corporeal and theatrical, address this process of embodied perception directly.

I will now proceed to a description of the mechanics and dynamic of the cognitive/physical persona as it relates to the theatrical space. Linking the two together is

---

27 Schematic processing is patterning, such as in coordinated movement patterns. Linear processing is cause and effect related, as in placing words in a linear structure to create a sentence. It is not exclusive processing, just an indication of processing dominance.
essential. I begin with a description of movement principles. Once this description is complete, I will relate how it is connected to imaginative brain function and the creative process.

**The Mechanics of Physical Perception**

There are, for our purposes, two aspects to a study of human movement. One deals with the dynamic of movement within the body, the other deals with the movement of the body in space. A study of the body's movement develops perceptual awareness. Which part of the body is moving? Where is the impetus for this movement coming from? How does a movement travel logically through the body? How is an awareness of the body in space embodied? This is proprioception made conscious. Of course logic can be emotional, physical, psychological, as well as intellectual. With this awareness comes control of the physical logic, pace, and muscle expressiveness of the move, and a vocabulary to study the mechanics of the body itself.

The second aspect deals with the relation of the body to the world, to the created space, architecturally, dynamically, out in the world of action and gesture - the body's expressive capabilities as they relate to the material world. This is kinesthesis made conscious. These two studies are inextricably linked, and the key to making use of them is balance – balance within the body, of the body and the surrounding space, a dynamic balance of muscle energy, and balance in play.

I begin with an exploration and analysis of the movement possibilities of the skeletal structure. Imagine a skeleton moving. These movements focus on the hinge action of the joints. Most skeletal hinges are multi-directional, like the joints in the hips, the spine, and shoulders. Each of these joints can be isolated to exploit movement possibilities individually. Some aspects of the description of specific movement sequences which follow, have been derived from my
previous work on training, entitled *Moving Images: Experiential Learning and the Physical Theatre*.

Consider the human head. A single directional movement can be initiated in a variety of ways. It can move forwards and backwards, and side to side. It can tip over forward and backward or side to side on an angle, and it can even shift straight forward or backward as well as from one side to the other. There are many possibilities and combinations. While exploring these possibilities, two sensations present themselves. One is some build-up of muscle frustration or tension, because the demand for precision is perhaps greater than what may be considered normal, and the participant is using conscious perception to accomplish the task. The second is a fascination with how the head moves, what it is capable of, and the logic created by initiating movement in one spot (the atlas vertebra at the top of the neck) and sensing the variety of responses. Both of these feelings - the frustration and the fascination are present.

If the head is placed in an upright position one can imagine a vertical line through it extending upwards from the spine. The head is capable of tilting or `inclining' off of that line. Inclination is one of the movements the skeleton is capable of. Keeping the head straight on the line and moving the head back and forth horizontally - at right-angles to the vertical line creates a small movement of displacement off of the vertical line. This movement can be done from side to side as well. Displacement is also part of the skeletal movement vocabulary. The head can be twisted, moving from one side to the other. This movement is called rotation. An entire skeletal movement vocabulary can be based on these three movement capabilities - inclination, rotation, and displacement. This approach to an analysis of movement emerged coincidentally with the invention of moving pictures, enabling the body to be studied in action, frame by frame and was
developed further for theatrical purposes by Etienne Decroux. From this base a vocabulary to study the movement of all of the various parts of the body can be established.

There is an important relationship between the point one moves from and the part of the body that moves - between stillness and movement. Stillness informs the expressive capabilities of movement within the body. There is a geometry to the body - lines by which the body-in-space is oriented in play: vertical, horizontal, and oblique; referring to individual parts of the body and to the body as a whole. This sense of line, stillness, and movement forms a basis for an understanding of the principles of geometry, and the geometry of the body.

One of the parts of the body of particular interest to explore is the spine. This exploration should be undertaken patiently. Problems with alignment in adult participants restrict the spine's movement capability and its flexibility. Some individuals discover and correct their own alignment problems, with patience and time, and others learn effective ways of working with problems which cannot be corrected. The key I use in approaching this study is to respect people's individuality and the way that they move. There is no 'proper' way of moving. Skeletal alignment is not simply the result of mechanical adjustments, but is also the result of emotional and life experience adjustments as well. Compression in the spine, or stiffness in the upper back are physical phenomena, but the cause may have an emotional or experiential dimension, and releasing the spine may release corresponding emotions and memories as well.

The spine, composed of vertebra, is all joints, so I have selected five points from which movement may originate - five hinge-points relating to the body's overall skeletal structure as well as the spine itself. Starting at the top, they are - 1) the very top of the spine - the atlas vertebra, isolating the movement of the head, 2) at the base of the neck, isolating the cervical vertebrae and the movement of the neck, 3) mid-back, isolating the thoracic vertebrae and the
ribcage. The next one (4) is in the lower back, isolating the lumbar vertebrae and the waist as well as acting as the hinge-point to isolate the last one (5) the coccyx or tail-bone and the movement of the hips. All of these hinge-points offer the capability of all three types of movement - rotation, inclination and displacement. Getting the spine to respond and developing an awareness of its movement capabilities is already a difficult job. Resistance and tension are not simply physical, but emotional and psychological as well.

Combinations of these moves create more complex movement patterns. One way of combining movement vocabularies is to move the spine in a logical sequence – starting at one end, a little like using individual words to put a sentence together. By choosing one of the three possibilities - inclining forward, the bending movement of the spine can be studied. By inclining forward with the head, adding the neck, rib-cage, waist, and hips, the body has bent over forward in a logical manner. By starting back up through the spine in reverse - hips, waist, rib-cage, neck and head the body is now standing erect. The same movements can be done by tilting to each side as well.

I have just combined isolating movements in a simple combination and analysed the mechanics of bending over. The movement starts from the head on the way down and the hips on the way up, is a simple, natural and logical movement study. This forms the basis for a study of the mechanics of the body. By beginning at any of the five points along the spine, other patterns can be created. Two people can explore this vocabulary together initially employing a mirror image, and then gradually dispensing with the mirror to respond freely to create an embodied expressive ‘conversation’ employing sequences of isolated movement. Separate parts can also be moved in opposing directions to explore the dynamic of opposition, such as torsion.
Beginning with a study of the body's mechanics enables an exploration of those movements in a sequentially logical and economical way. Maintaining a relationship between stillness and movement provides control and physical awareness. Studying the physical logic in bending over, looking around, looking up, backing up, going forward, turning etc., explores the many applications of the possibilities of proprioceptive movement within the body. All of these attitudes begin to evoke images - emotional, physical, and situational. They are not necessarily 'economical', the simplest way, based on a technical study, but they are potentially theatrical.

There is a difference between the simplicity of a study, and the luxury of theatrical play. Looking around: rotating or twisting the head to one side, then the neck, the rib-cage, waist, and finally the hips, causes the spine to travel 180 degrees. A series of single direction lines creates a spiral. By returning, starting from the hips one arrives at the front again, in a single direction study. Beginning from the top, with the body already looking behind, the head can be rotated around in the opposite direction, followed by the neck, rib-cage, waist and hips, arriving at a stillness, looking behind on the opposite side. This is called a reversal or torsion movement in the spine, travelling through 360 degrees, referred to as double design. A triple design involves all three possibilities of movement in any combined sequence. Participants discover that compression in the spine does not develop control, it builds up tension and creates stress in the body. Torsion is an excellent movement opportunity to feel a freedom in the isolation points as well as sensing the muscle resistance needed to permit stillness. What is taking place physically is also taking place mentally – all of these discoveries are embodied.

The dynamic of adjoining parts of the spine working in opposite directions creates an awareness of the point of stillness between them, gradually employing the deeper muscle groups along and around the spine, instead of relying on the larger surface muscles. This deep
muscle/skeletal work reverberates in the brain, creating pathways, and an enhanced tactile sense.

Damasio states:

That the body, in most of its aspects, is continuously mapped in the brain and that a variable but considerable amount of the related information does enter the conscious mind is a proven fact. In order for the brain to coordinate physiological states in the body proper, which it can do without our being consciously aware of what is going on, the brain must be informed about the various physiological parameters at different regions of the body. (Self 108)

Another study can also be created by employing a reversal to the side – an infinity symbol (∞) movement which Lecoq referred to as the snake, and displacements can also be invented in sequence and in opposition.

Employing two adjoining isolation points in opposition to each other, such as the head and neck – twisting them both to the left, then looking back to the right with just the head, works muscle tone and body sense awareness. These movements also nurture a sense that parts of the body have a dynamic relation to each other. Tilting the rib-cage back causes the tail-bone to angle back slightly. Tilting the rib-cage forward causes the hips to tuck under slightly. Both ends of the spine relate to each other. Many yoga-based movements employ this relationship.

Utilizing a different position, on all fours with the spine horizontal breaks the vertical routine, and so I have developed many floor routines as well. Employing this head/hip relationship when standing results in describing a vertical circle in front of the body. As the circle moves around, a wave is created through the spine, or an undulation. As the head tilts under at the bottom of the circle the hips have tucked under and are engaged to continue the circle. This undulation from a standing position in a clockwise direction creates an awareness of
the energy being directed into the body and out into the space. The body travels from a curved inward focus to an elongated outward focus in a movement with no beginning and no end - a circle. It also establishes a study of how energy travels within and around the body.

Once the individual becomes adept at this vocabulary in the spine, it can be extended into the limbs as well. The skeletal based movement of the hips, knees, and ankles can also be isolated, as well as the shoulder-blades, elbows and wrists. The hips and shoulders are especially interesting as each can move independently, and they can move in relation to each other. One hip can remain still - a fixed point, the centre point (tail-bone) can be fixed, or the other hip can be still, and the same with the shoulders. This is important in a study of the human walk.

The idea of stillness, creating a fixed point inside the body and in space, is the isolation point that remains still so that there is definition to that part of the body that is moving. There is always a dynamic relationship between stillness and movement in the body - even in acrobatics. A physical, or experiential awareness of this is the beginning of real physical embodiment. During this exploration the students become aware of all of the connections within the body, as well as developing a sense of the entire body in space.

This skeletal exploration is not something that the body masters quickly, and this exploration continues in various forms throughout the program. Different skeletal explorations can be developed, and they transform from being routines, to becoming an informed exploration of the dynamic of movement itself. Improvisational techniques are used often, to transfer technique into play. These skills are then employed in the development of studies of movement in space. Patterns are created with them, and they become choreography.
The Muscles

Of course, the skeleton doesn’t move by itself. Muscles are capable of two actions - contracting and releasing. They work harmoniously in combination to permit the range of movement we each possess. The pneumatic aspects of mechanics employs the same principle.

Certain muscles are involuntary - the heart and diaphragm for example. They are called involuntary, but we can and do affect them. The heart responds, beating faster and slower as needed, and there is a great and subtle effect on the operation of the diaphragm in the engagement with the lungs in the act of breathing. The enormous range and possibilities of the human voice attest to an ability to work with this involuntary muscle. The lung and heart muscles also affect the whole personality a great deal, consciously and non-consciously.

Muscles have memory. They respond to our total being in a balanced and considered way, if they are permitted. We can override our muscle sense in a life-threatening situation for instance. However, physical training programs which systematically demand that one ignores one’s physical being in pursuit of a goal are, to me, the antithesis of embodied learning. Individuals immersed in this type of training, from sport as well as the arts know instinctively that they have lost something – perceptual, emotional and embodied spontaneity and interconnectivity. Usually the imagination and emotions have been divorced from the body. The body is taught to respond in automatic, set patterns, as a tool or instrument. This should not be confused with a development of physical skill. An example I have experienced directly of this type of learning occurs at times with those trained extensively in classical dance technique, as I learned while teaching with the National Ballet of Canada, and with former dancers in my own school. No matter what they do to break these set physical patterns, while undertaking modern dance choreography for instance, they always move like classical ballet dancers.
Along with layers of muscle the skeleton also has tendons and ligaments. They all combine to counter the force of gravity, by creating a dynamic living stillness. It is from this dynamic of stillness and movement that a physical sense of the theatre is born.

**Energy**

Muscle energy can be explored on two levels, the energy demand exhibited by the muscles themselves, and the energy employed when playing (representing) this type of muscle demand. Energy is both proprioceptive and kinaesthetic. This is especially evident when working with images of violence. In the theatre these different muscle energies are always played. Muscle energy (tension) can also be masked or hidden from others. One acts calmly, even when one is tense. To permit all of the possibilities of played energy, it is paramount to clearly establish an appropriate energy for the creator/performer herself, a neutrality, which maintains a distance between the performer and what they are performing. Otherwise a confusion develops between real actions and played actions, and between real emotion and played emotion.

When an aspect of the world is 'experienced' for the first time, perception is directed outwards, physically, mentally, and emotionally to engage with it. This level of muscle energy I call suspension, or calm. The downhill skier mentioned earlier called it ‘being in the zone’. This involves a cognitive reversal. In my creative training this reversal is associated with identification. Without the experience of suspense, performance is unfocused and artistic creation often becomes stereotypical. All of the events taking place on stage are intended to be happening ‘for the first time’, even though the actors have already rehearsed them many times.

The musician, the painter, the architect, writer, and sculptor all sense this zone of calm, as well as the athlete and the innovator.
Suspension is an altered state of being. We are all capable of it. It is simple, but not easy. The only way to access this state of being is by experiencing it, imprinting this sense as neuro-pathways and as muscle memory. It is not a matter of accomplishing certain exercises, or an idea. This energy level is central to the creative process and must be addressed directly, as I will discuss in more depth in the next chapter.

There are other energy levels encountered in play. A person walks down a street on the way to work every day. This level of muscle energy is economical and is efficient. The individual exists in the bubble of her private world, and she thinks about the things that concern her. Her intellect usually has the upper hand. The rhythm of the walk in this muscle state is associated with the heart-rate. Routine tasks are easily tolerated. She is comfortable, and becomes comfortable with set patterns.

Economical energy can also be masked. One can be dealing with a crisis, and attempting to conceal his anxiety by keeping everything on a routine, economical level of energy. He can create the impression that everything is just fine, even when it is not. The spy in a thriller must remain cool and in control. A woman alone in dangerous circumstances, tries to act ‘natural’.

We have other muscle states - being tensed up for instance. In the theatre this is called ‘dramatic tension’ in which the conflict is played. If the actor herself is unduly tense or nervous, it usually results in a poor performance. In reality a physical state of muscle tension causes muscle stress.

Challenge is positive, stimulation of the senses is positive, and engagement is positive, muscle work is positive, but in my experience muscle stress is not. Stress occurs when muscles work by pushing or pulling against each other within the body. Keeping up this muscle and emotional stress for extended periods causes the muscles to get tired and strained. If it continues
they fatigue. Muscle fatigue begins to break down the system, emotionally and physically. A person reaches a crisis point. Compare muscle stress with mental stress - creating conflicting pressures continuously. This often leads to burn out. In the training process these energy states are being studied on two levels, as actual muscle states and as played muscle states.

The state of muscle relaxation is social. It is fun, it's generous, and it's casual. It can be passive or active. This state can be played, for example, as nonchalant or celebratory, and often presents itself in a counter-culture context. A casual language, both physical and verbal, can be developed – a ‘lingo’. At times the generous energy of a theatre musical creates this ‘social’ energy response in the audience, or it can be employed for dramatic purposes as casual or disassociated violence in an action adventure.

In an emotional or active muscle state the body responds directly to the emotions. If one is startled, he runs and if he is angry, he lashes out. There is a dynamic relationship between affect and narrative. This is associated anatomically with the autonomic nervous system. Responding directly, without reflecting first may be essential to survival in some situations. The diaphragm and breath are affected, as is the heart-rate. This level of muscle energy may be explosive or stimulating. Theatrically speaking it may become comedic – a farce, a physical comedy, or passionate – a soap opera, or high drama. Although it may be considered exceptional, it is a part of our culture.

This leaves two extremes of muscle energy - a state of collapse, or imbalance, and a state of maximum sustained effort. The state of collapse is labelled as chaotic or absurd, where events stop making sense, and survival is the only reality. The state of extreme sustained exertion is tragic or ritualized. It is the endurance of an unresolvable conflict. These two extremes are both connected. In a state of collapse the person is losing the struggle with gravity, cognition
becomes disjointed, the world ceases to make rational sense and he/she has difficulty imagining a stable future. Sustained, this state creates a profound instability. In a muscle state of constant focused exertion the person is face to face with the act of survival. In a theatrical context fate and destiny, blindness and sight are engaged in the body and imagination, in a life and death struggle.

Based on this description of different levels of played energy, there are seven played muscle states: 1) a state of collapse, 2) a state of relaxation, 3) an economical state, 4) a state of calm, or suspense, 5) a state of tension, 6) an active/emotional state, and 7) a state of maximum sustained effort. Each state may be encountered physically and emotionally, they are not mechanical or a disembodied idea. They can be explored as movement studies and in situations, or as 'styles' of play. An atmosphere can be developed in the stage space using these energy states. How is a stage space activated to create an atmosphere of fear and suspense, tension, or chaos? How might a stage designer approach these states spatially? They can be played in counterpoint, and there is lots of room for subtlety, and change. In a sense it is a part of muscle ‘education’ and a direct link to creating and the tactile imagination.

It is no accident that the state of calm/suspense is in the middle. A thorough experiential understanding of this muscle state is essential to experience all of this work. For example, it is necessary to muscularly understand a state of calm to experience skeletal isolations – stillness and movement. This is the performer's real muscle energy in performance, and the creator’s during the creative act. It is identification and it is connected directly with the ability to permit perception to support the imagination (reversal), and permit the imagination to be engaged on a
conscious level in the creative process. It is the wellspring of the creative process itself and it is a foundation for this pedagogical exploration. In this state the body and mind are one.\(^\text{28}\)

**The Breath**

The breath cycle and heart circulation systems are one of the most efficient engines in existence. To obtain oxygen, our fuel, gravity does the work for us, or most of it. It is a wondrous process, and infinitely subtle. Breathing is life itself. Muscles require oxygen to function. We breathe the ever-changing rhythms of our lives. Breathing is involuntary. It can be interrupted for a while, but it resumes.

In the act of breathing the diaphragm contracts causing the attached lung sacks to elongate to create a reduced air pressure in the lungs. The air rushes in to fill the partial vacuum and re-establish a balance between the outside air pressure and the pressure inside the chest cavity, and the in-breath occurs. The diaphragm then releases, or relaxes, back to its original position, exhausting the spent air, and we breathe out. Breathing out is a release. This is how people breathe when they are asleep - diaphragmatically. When one is conscious of breathing other factors affect the mechanics.\(^\text{29}\)

When people tense up, usually in the stomach muscles, because they are self-conscious for instance, they inhibit the free movement of the diaphragm. They compensate by lifting the rib-cage and breathing shallowly. They create the illusion of breathing by moving the rib-cage, but they don't get much oxygen. They inhibit their breathing when they are nervous. When they

\(^{28}\) This state should not be interpreted as meditative or health related. It can be experienced by anyone in any physical condition, in any situation.

\(^{29}\) It is interesting to note that this process still functions in zero gravity (outer space).
are upset they may hold their breath, dropping the emotional energy by reducing the oxygen supply, causing the muscles to relax. These forced changes to the breath cycle connect to the cardio-vascular system and create adjustments in the entire body, including the brain.

Hyperventilation saturates the system with oxygen providing an overly-rich fuel supply causing the muscles to release, then relax to slow down the flow – even to the point of losing consciousness. Not enough oxygen causes the system to work at less than optimum efficiency. If one feels short of breath, he may begin to panic. Some people chronically restrict the oxygen supply through shallow breathing over time. They start to feel trapped. The body compensates for lazy breathing by creating an involuntary diaphragmatic breath and we yawn, restabilising the oxygen level. The breath is involuntary for a reason - so that it can work automatically and in harmony with the total organism. It is not controlled by conscious cognition, unless one overrides the natural process by conscious intervention, and brain chemistry becomes the recipient of these changes. When it works well, in balance with play, it connects with the imagination in a muscle state of suspense.

Why is the breath and the body important in a discussion of the imagination and creative practice? There are two reasons. One is that there is an optimal physical state to enable the creative process, which is facilitated by a state of calm. This can be achieved no matter what physical state the body is in. The other is that the tactile imagination is in continual contact with all of the body’s systems, and what is happening with these systems from moment to moment affects the imagination and the act of creating. The state of calm, or suspense is an embodied state, and imagery developed imaginatively is embodied imagery.

There are a number of approaches to arrive at this sense awareness of the breath. The connection of the breath and active relaxation permit a conscious experience of the natural breath
cycle. Work can be done specifically with responsiveness and support using the diaphragm - it is a muscle. I work with imagery such as laughing (focusing on breathing in) and crying (breathing out) using a natural breath response. It is interesting to note that the physical act of laughing or crying quickly engages the emotions as well, and the laughter and grief become genuine.

To support the proprioceptive movement studies described above, such as isolations, the breath cycle can be separated into four parts: breathing in, suspension at the top of the breath (not to be confused with holding the breath), breathing out, and suspension at the bottom. This connection creates an emotional engagement. What kinds of movement might associate with each part of the cycle? The head turns in surprise accompanied by breathing in, not knowing what happens next, and the breath is suspended. By connecting specific patterns of breathing to the pattern of attitudes developed in movement studies, one breathes emotional, imaginative, and perceptual life into the movements and transfers breathing into punctuation, rhythm, and play, physically and vocally. Breath provides a bridge between proprioception and kinaesthetics, a proprioceptive relationship between the body in stillness and the body in movement.

**Observations**

The discoveries being made physically in this proprioceptive/kinesthetic study, are also being made in the mind as associative patterns, and in the brain as pathway development. The brain and the body are one, so this is proprioception for the brain. The sense of touch – the tactile sense is becoming sensitized, intelligent, and inventive. The body is touched and touches the environment – on many levels. This training is brain/body training, and the imagination is at the centre of it, in the possibilities, the patterns, and the compositions it offers. Neural networks have already been established, so this work forms an extension of the networking process.
This approach has not been focused on training the body to master a certain type of movement, or movement style. The intention has been to develop a sense awareness of movement itself. It is inclusive. In this work proprioceptive analysis has developed considerably, but there is only a minimal perceptible change in the way each individual moves. In my experience, from a physical standpoint, no physical ‘imprint’ has been embedded in the participants’ movement patterns.

The study is grounded in human movement itself. Principles of stillness and movement, where a movement begins and how it engages other parts of the body and in what order; rotation, inclination and displacement, balance, energy, and the body and space, are all being explored, but they have not sought to shape the body to adopt a specific style of movement. Instead the purpose has been to enhance an experience of movement itself. These experiential principles have been embedded in procedural episodic memory in such a way that they become highly adaptable. These principles are common to all of us, and are useful for the writer, director, choreographer and performer, as stated by Lecoq earlier. They do not demand that participants have a certain body type, or move only in certain ways. Individuals who have completed this work are generally more adventurous, more confident, more aware, and in better physical condition, but they have not been disciplined to move in one fashion. Instead what has been developed is subtler and long lasting, because the training regime has engaged the imagination. They have changed, and a great deal of this change has taken place in the embodied brain. In a sense the body and the brain are mirrors of each other.

Participants have been provided with a new approach to a study of movement, which is designed to open doors to develop choreography instinctively. This work over time becomes embedded as imaginative methodology, so that participants no longer need to analyse a
movement pattern, but engage with movement logic, directionality, attitude, definition, energy, breath, and patterning immediately and without prompting in the development and performance of imagery in the theatrical space. These capabilities become a part of their embodied lexicon, similar to a pianist learning her instrument until it begins to change and she makes music with it. In addition, it has engaged associatively with imaginative brain function to enable the composition of compelling imagery. It ultimately supports the creative process itself.

I will now move on to an extension of this embodied exploration. I have discussed movement within the body, its geometry, logic, dynamic and stillness, and have introduced the relationship between the body and the animated space. Now I will turn to a study of the body in space, in the act of doing. This is the world of activities and gesture.

Part 2: The Kinaesthetic Study

The Body in Space

The body’s centre of gravity is not the head. This may sound obvious, but it is a reminder that the head is part of the body. This centre of gravity is the physical, experiential centre of the body - associated with the last isolation point at the bottom of the spine, the hips. Discovering and experiencing this point is called centring. This happens during an exploration of movement separations described earlier, and in the sensation of stillness. It is also a process to experience balance similar to that used in martial arts and yoga, called anchoring. It is anchoring the tailbone in a position associated with a point between the feet, placing the hips in a slightly tucked position of readiness. In this position the lower spine is aligned to support the spinal column and the lower back is ‘plugged in’, connecting the upper and lower halves of the body. This physical connection to the floor, or grounding, is associated with a sense of presence. It is important to
have a sense of this as preparation for a study of acrobatics – especially balance moves and contact improvisation. Acrobatics and movement analysis are symbiotic.

**The Theatrical Space**

The empty space - the stage, is capable of limitless representative realities. It is by analogy, a quantum space – a space of multiple dimensions and parallel worlds. It is both proprioceptive and kinaesthetic. It is also an invitation to play. Simply by moving onto the empty stage space, there is already a life - a play happening. It is the relationship between one’s presence and the space itself.

To get a sense of the animation of the space, imagine that it is balanced at one point - the centre, and it is capable of tilting and moving on this point. If someone enters the space, it begins to tilt off balance. The space is animated. For one person alone on stage to put the space in balance it is necessary to be positioned over the balance point - in the centre. To make this a stage space there must be an audience. If the balance point is in the mathematical centre of the space, it would indicate that there is an audience all around, as in the arena stage.

This balance point is the natural focal point for the audience, the point that their eyes are drawn to, so the player in the space creates a special relationship with the audience. On a proscenium stage, with the audience all at one end, this focal point is upstage of the mathematical centre, and on the Shakespearean stage it is downstage of centre, creating a warm feeling for the audience and the performers. On a non-conscious level, the imagination of the creator/performer and the audience are already engaged.

If the solo performer moves away from the centre the space is out of balance and this acts as a catalyst, an offer, for a second person to enter into the space to return it to balance. As these
two performers move in the space, the audience becomes aware of their relationship to the space itself constantly. In fact, it can create a narrative in which the space is animated to present a story to an audience. The performers have a constantly changing relationship to each other, the audience, and the space at the same time. A third person is called into the space. An image of conflict is created. Participants play with this image in relation to the space. Others are added.

There are many dimensions to balance. Balancing vertically. Opposites balance, and the space can be out of balance. There is emotional balance, a balance of power, as well as a balance of imagery. There are no rules, or it is simply a game. There are leaders who offer and the others respond. The offer and response can reverse spontaneously as the situation and play demand.

Participants build a situational/interactive narrative. They play with the relationship between performers and objects in the animated space. This forms an opportunity to explore choreography and scenic design. The space becomes the platform for the imagination in creative practice, and the space itself is both an internal and an external reality.

Thematic, situational, choreographic, architectural, atmospheric, emotional, and psychological play all have a spatial dimension. Everyone involved in the production of a play is attempting to create, shape, and animate a theatrical space. All that is required is for the audience to willingly engage. McConachie states that: “Spectators use their material and social surroundings as well as their bodies and brains to take action and make meaning during a performance” (*Affective Performance* 186).

By balancing the internal exploration of the creator/performer - suspended muscle energy, centred, grounded, focused and supporting the play in the theatrical space, an opportunity for animation is established. This is what I mean by presence. The creator physically, emotionally, intellectually, inhabiting the created space, imaginary and real.
Kinetics

The study of kinetics is a way of focusing specifically on the logical pattern and dynamic of our embodied relationship to the world around us. Remove specific circumstances, remove intent, remove the objects themselves, and it permits us to uncover our relationship to the physical world and to educate the embodied mind. Our purpose is to re-create that world on the stage.

The study here focuses on an analysis of the body in contact with the physical world - doing things - the world of gesture and action. For most of us gesture connotes simple moves of parts of the body - a hand gesture for instance. My reference to gesture here is theatrical, the body in action, and an action with meaning, in the act of discovering. Walking, pulling, taking something, letting go, in a theatrical context, have associative meaning. This connects directly with associative patterns in imaginative brain function. To have access to this theatrical vocabulary, as creators we must understand the nature of a movement, its dynamic as well as its mechanics.

Movement phrases have been devised to support a development of active embodiment. They are not related to a specific image, but instead act as a link between the proprioceptive movement vocabulary established earlier in this chapter, and the study of activities. The balance centre of the body is the hips – it is our centre of gravity. Moving the centre of gravity initiates movement in space. The displacement of the hips can be evidenced in a study of the human walk. In preparation, I employ a number of studies to focus on the movement of the hips, including travelling the hips in all directions to the edge of balance and beyond, employing the
undulation of the spine, and devising sequences employing attitudes of verticity, inclination and horizontal play in space.

**The Human Walk**

The act of walking is a study in action. An attempt to capture the dynamic of the walk must not change the mechanical action to adjust to the need to break it down into a series of attitudes. The first obstacle is finding a logical starting point. The study sequence ends when it begins to repeat itself. The mechanics and the dynamic are not easily captured together. The dynamic - displacement, co-ordination, counter-torsion, rhythm, and balance affect the entire system all at once. We all walk slightly differently, but this is a study of the human walk via the movements which are necessary for everyone in the act of walking. The study is only the raw material for play.

The mechanical study focuses on transporting the body in space, so I have devised a series of ten attitudes to delineate the walk. I begin the first attitude at the moment that the hips displace forward in space, when the weight begins to shift from the back leg to the front. The walk is in full stride, the limbs at maximum amplitude from the centre of the body. In the second attitude, the weight begins to shift, coming off of the toes of the back foot, while the front foot is beginning its descent towards the floor. Both legs are straight. The arms are just beginning the reverse swing towards the body. In the third attitude the body leans slightly forward, the arms swing a little closer to the body, and the weight has come off of the back leg. In the fourth both knees are bent. In the fifth the body leans as the weight shifts completely onto the front foot. In the sixth, the front leg is straight while the back leg is swinging forward. In the seventh attitude
the arms have swung past the body and are beginning their move away. The foot is just about to pass the other one.

The eighth attitude is the beginning of the next step. The arms continue away from the body. The knee is being lifted in preparation to extend the front leg. In the ninth attitude the back heel is beginning to lift, the body is forward and both legs are straight. In the tenth and final attitude, the arms approach full amplitude, back elbow bent. The weight is coming off of the ball of the back foot, the front one is flexed, ready to receive the weight. Returning to the first position - the back straightens, the front heel touches, the trunk is vertical and the sequence begins to repeat itself on the opposite side. The walk is being studied from the vantage point of a side view. The study employs both proprioceptive and kinaesthetic principles.

What does this have to do with the imagination? It has a great deal to do with the act of imagining, and the imagination in the creative process. It is immediately apparent how inadequate words are as a means of describing movements of the whole body in action. It overemphasises detail, and at the same time seems descriptively clumsy. This is because many things are happening simultaneously, and words are, of necessity, linear. The dynamic of the walk can best be viewed from the front and above. Pictorially, both the imagination and the body pick up the patterns of the ten attitudes almost instantaneously. Because this study has removed individuality, to focus on the logic and dynamic of the human walk itself, it provides the opportunity to imaginatively engage in all of the possible variations, in theatre, dance, puppetry, and animation as well as medical, photographic, and many other applications. The common purpose is to provide the means to enable many possible directions to be taken, based on an analysis of this foundational study.
Three Mimetic Principles

There are three studies which establish movement principles employed in most action phrases. I have created phrases to focus on these actions specifically. The first is the fixed point, picked up from the study of movement and stillness. The physical space around us has a relationship to the body. To define this special relationship a reference point is required, a point fixed in space. If one is moving through a forest, stepping over tree trunks, moving past trees, and around branches, these objects have a stillness relative to the body’s movement, permitting a definition of both space and movement. There is a relationship between the fixed point inside the body and the external fixed object in the environment.

The body, and the imagination have a spatial sense. In fact this sense can become highly developed, extremely sensitive, in a word, intelligent. Siedlecki and Salthouse state, in Using Contextual Analysis to Investigate the Nature of Spatial Memory that: “The results of the present study suggest that different spatial memory tasks have strong unique relations with measures of fluid intelligence and, surprisingly, are not significantly uniquely related to memory, despite requiring the recall of information” (726). The body becomes schematically intelligent - the mapping aspect of imaginative brain function is at work, the part that is not conscious. If consciousness takes control, the individual consciously tells himself what to do, and checks to ensure he has really accomplished it. The conscious linear symbolic mind exerts its tyranny over the schematic non-conscious mind.

Reconciling this internal struggle in the brain can be difficult. Finding a sense of suspense is reconciling that internal struggle for dominance taking place between the two aspects of brain function. Why is it occurring? A self-conscious focus is usually accompanied by an internal dialogue picking away at our physical movement – a critic commenting negatively on
the body it moves. By permitting the internal struggle to cease, all of a person’s perception focuses outwards. This sense of self is the basis for consciousness. The body and the mind work together. On a number of levels the fixed point provides a reference, a point of stillness creating a logic and order to movement, and permitting both the stillness and the movement to have meaning. Students are not memorizing movement sequences, they are embedding kinetic principles in their imaginations.

The second principle is the use of effort. People exist in an atmosphere with gravity and the physical world has weight. When someone moves something it requires effort - and they encounter the act of pushing, pulling, and lifting. Resistance and movement have already been encountered internally, while working with a fixed point as proprioception.

To analyse the move of pushing I draw on the knowledge of the isolations in the body. The body leans into the move - you push. There is a dynamic relationship between the use of force and the re-alignment of the body, between an external and an internal reality, and between proprioception and kinaesthetics. The image of force comes from the centre of the body - the physical centre, the hips.

Pulling is the reverse. The energy of the body is being directed away from the object to overcome the resistance of its weight - action, re-action. The image of lifting combines both pulling and pushing. One pulls for the first half up to the waist, and pushes for the second half, to above the head. Analysing it gets easier with experience. Eventually the process of analysing movement becomes automatic, including the sense of pattern logic. The amount of effort applied relates to the weight and resistance of the object, resulting in a balance between the external and internal worlds.
The third principle has already been used. It is making contact with the physical world - grabbing something. Approach, grab, release, and relax. There are countless examples of this movement sequence. A number of noteworthy observations may occur when people attempt this exercise of making contact with the material world. Doing everything with one arm indicates conscious control – a linear process. Focusing outward and trusting oneself is simpler and more economical, and requires fewer moves. Another observation is a tendency to move on to the next action before the current action has been completed. Anticipating what to do next causes the imagination to move ahead while the body is still involved physically with the present action. By permitting one’s imagination and movement to be focused on the same image together, remaining in the moment and letting the future take care of itself, the creator/performer establishes a presence in what they are doing.

**Gesture Phrases: Work**

The first aspect of developing a study is to choose the phrase of movement, as was witnessed in the study of the walk. Where does it begin and end, or start to repeat itself? What constitutes a complete phrase? What is the phrase of movement which accurately represents the activity? These choices need to be made, and they are not always the most obvious ones. One has to be careful not to change the movement itself because it is being studied.\(^3^0\) Many images related to aspects of physical work are now only of historical interest.

Considering individual ways of moving shifts the study into an exploration of a person enacting the activity instead of analysing the study itself. The purpose is to study the human

\(^3^0\) I have spent many hours researching specific work sequences employing documentary footage capable of being viewed frame by frame, courtesy of Canada’s National Film Board archives.
movements which are mechanically necessary for everyone in the act of doing the activity in the most economical fashion. Participants analyse each action as a sequence of attitudes. Where does each attitude begin and end? If you run these physical attitudes together would they accurately and logically create the movement phrase? Are there any gaps in continuity, or are there too many moves? Has it been broken down too much? What constitutes a movement? The study must be made carefully and actions must have a natural physical continuity and logic. This may sound laborious, but students soon accomplish this very quickly, after encountering a few studies. Kinetic pathways have been established. To create choreography, like film editing, continuity is crucial.

Take the example of opening the door. If you look at the door you may be less familiar with it and what is on the other side of the door is unknown. If you step first you may be familiar with it and it is routine. If you do both you are hesitating. The variations in play are legion, and as imagery, provided by the imagination, these details may take on considerable significance. The simplest way both physically and logically is suspending judgement. This is what I mean by neutrality, a physical neutrality associated with first time, not an emotional disengagement.

The first part of creating a study is analysing and breaking the movements down into attitudes. All of the basic laws of physics apply. Once the study has been established and repeated, participants get the feel of the phrase, by developing their spatial and procedural memory. As muscle intelligence is engaged, this process of analysing becomes quicker and the body begins to know where movement phrases begin and end, developing trust, and craft. These studies are specific to creating material for physical performance. Other studies may be used ‘for music, or painting, or writing stories or poetry. What is important is the principal.
Our physical identification with the study of images from the past gives us an experiential understanding of our roots, a perspective on rhythm, and a basis for our physical understanding of the present and the future. Our experiential understanding of physical logic forms the basis for our appreciation of abstract logic. Our physical understanding of the dynamics of the body extends into our comprehension of physical laws governing our universe. There is a rewarding relationship between physical and intellectual education. This identification can be transferred. Transference is the ability to take embodied processes from one domain into another. The process of transferring experience - applying experiential knowledge to discovery, is the basis of our ability to reason.

Before I move to an experiential exploration of the theatre there is one more aspect of the body in space that I must introduce to make my exploration complete. This is the transporting of the body, the body in action. Acrobatics.

Part 3: The Study of Movement in Action - Acrobatics

Making Demands on the Body

In a sense, acrobatics is experiential learning in its purest form. It is always a joy to watch individuals not always naturally suited to this work, with physical impediments, with a great deal of fear; overcome all of these in a simple celebration of movement and their own bodies. During acrobatic movement, the inner self-critical voice is silent, and all of one’s perception is focused outwards into the space. The participants are inside their bodies and their bodies are awake. Even when my students are struggling with new and difficult aspects of the theatrical process, they have energy and joie de vivre during acrobatics. One of the prime lessons to learn from acrobatics, is how to maintain this focus and energy in all of the work. Acrobatics is the process
of overcoming passive resistance, and the only way to do it is experientially. Overcoming passive resistance, opens pathways to the imagination in the act of creation.

Passive resistance is not a concept, it is physical. While young people are busy learning conceptually, many of them are also very busy learning how to passively resist physically. For some people this goes so far that they find it extremely difficult to learn on any level. It is the legacy of an educational system developed to provide intellectual skills in an environment already full of physical demands outside of the educational system.

In my training I balance intellectual intelligence with experiential intelligence, and the two processes are complementary and not mutually exclusive. They intersect in the imagination. Physical skill and imaginative development go hand in hand. The demands made on the body are also made on the psyche. The physical understanding discovered in an exploration of the dynamic of moving through space reverberates throughout our being. Participants gain an experiential understanding of energy. They discover that the body wants to move, and learn the difference between work and stress muscually. They learn to sustain muscle energy, and how to direct it supportively. They learn how to tone their muscles to the task. They learn efficiency, how to use only enough energy to accomplish the movement. The amount of energy required to overcome passive resistance can be enormous, and the struggle individuals have with their fear is considerable. The attempt sometimes made to employ a linear, intellectual process to solve a schematic problem often inspires comical results. Soon participants learn that problem solving is not a patterned process, and acrobatics is all about patterns.

Then a breakthrough occurs; one begins to trust the non-conscious brain, to think physically, and experience the thrill of finding the pattern - the appropriate energy, co-ordination, timing, focus, and muscular support - the ability to think and to learn experientially. Participants
gain a physical understanding of muscle relaxation - the moment when the move feels effortless. This prepares the imagination for the act of creating.

Acrobatics is the art of using the minimum amount of energy to accomplish the task. Students learn to support with their breath, and not to sabotage their body. They focus, imaging the body through a simulation of the move, and not just picturing the move but also picturing their own body accomplishing the move. They learn trust - permitting the body to improvise while all of one’s perception is focused out on the play, and the imagination and emotional memory are completely engaged in the present, finding an altered perceptual state. When viewed in this manner acrobatics is indeed an exciting study, and an essential part of the training of the theatre artist creating new material. It is not competitive or outcome driven, but is entirely about process.

The Process

The process I use is evolutionary, but there are others. The structure is dependent on the individual instructor, the demands of the program, and the level of ability of the participants. I have had groups containing both an individual with a spinal injury, as well as an individual with previous competitive experience at the Olympic level in the same class. The injured individual learned to work with her body’s possibilities, and the Olympic acrobat let go of her gymnastic regimentation to engage her imagination. Each individual is challenging him or herself, and this is shared supportively by the group. This work must also be continually cross-referenced with the other aspects of the process. Adequate physical preparation, proper equipment, and a sensible attitude to safety are crucial to build an atmosphere of trust and mutual respect.
With individual participants I watch for two phenomena. The first is poor muscle tone, when an individual tends to make a muscle demand and then suddenly releases during the move. Individual work must be done on developing physical trust and a sense of sustained muscle energy. I have found that when everyone goes at their own pace, they develop faster. Pushing oneself only makes the learning slower by building resistance. Patience is essential. The imagination works with possibilities instead of through executive control.

The second phenomenon occurs when individuals make the breakthrough to thinking physically, and then have a surge of psychic energy. They feel euphoric and invincible. They then attempt challenging and unfamiliar moves too quickly and at too advanced a level. At this point it is crucial to emphasize focus and economy of energy while maintaining the challenge. Physical and procedural pathway training is already under way. This discovery process is carefully structured.

I begin with moving from a vertical to a horizontal position - falling. I introduce the sense of release, and directing energy instead of controlling it. I also introduce the floor as support instead of being the enemy – introducing a sense of trust. I emphasize connecting breath and muscle energy and permitting the body to move instead of ordering it around. Then the falls are played in narrative situations as theatrical imagery.

I then introduce rolling, to work with sustaining muscle energy, and finding a circle to develop pattern imaging. Combinations are worked with, both set and improvised, to develop focus and trust. Co-ordination and timing are developed by combining movements with other participants. I introduce other supports to work with, rolling over a table, down stairs, and
working with other participants. This collaborative improvisational engagement becomes contact improvisation.\textsuperscript{31}

Centring and balance are worked on by introducing stands - the yoga headstand up to handstands. Balancing on the skeleton and alignment are emphasized. Balancing architecturally on the skeleton, instead of struggling to maintain balance muscularly is discovered. Combining rolls and stands permit the participants to discover and develop sustained energy, economy, spatial sense, focus and pattern thinking. They are coincidentally developing muscle tone and strength.

I then introduce springing moves - cartwheels, round-offs, kip-ups, neck springs, hand springs, and flips. Imaging, physical memory, muscle energy, co-ordination and trust develop further. There is an interesting connection developing between representation, simulation and association in episodic memory and the cognitive reversal employed in imaginative patterning.

With this development participants are taught how to spot each other, work together, and support each other’s progress. I then introduce aerial moves, working with equipment - vaulting, rolling, springing and working with each other as a base at a more advanced level. This work begins to connect with circus technique and stunt work. Each individual works to their own optimum level, and there is no pressure to accomplish more demanding moves.

\textbf{Applications}

Through the entire process it is essential to relate the discoveries made to other aspects of the work. Specific applications are introduced to direct the physical vocabulary towards

\textsuperscript{31} Contact improvisation is an improvised dance form developed originally in California, which took advances in kinetics into a popular medium.
theatrical imagery. Acrobatic movement is also combined with breath, and vocal exploration. At a point when participants are adequately prepared I introduce imagery and theatrical play. At an appropriate time stage fighting, juggling, and circus technique, sculptural play and dance choreography are also introduced. Participants are encouraged to develop theatrical presentations transferring these techniques into their own work.

Acrobatics as a study has been deliberately chosen because it provides a purely practical self-discipline, as opposed to a stylistic vocabulary. It focuses the attention out on the experiential development process and it has considerable theatrical application, while leaving the stylistic choice completely up to the individual participant. It also provides maximal benefit on an introductory as well as advanced level, and individuals are free to seek their own level of challenge. Each individual discovers how best to work with her own physical attributes – to inhabit her own body, and to take this embodiment into her creative process.

Since the training is embedded in procedural, episodic and working memory, the students also take their own experience with them, they own it and apply it as they see fit. Whether they ever do a cartwheel again makes little difference. Cartwheels can be imagined on many levels, from the concrete to the abstract. This is the notion of neural reuse and dynamic systems theory, in which pathways in the brain are re-used on many levels – sight becomes insight, pattern coordination becomes mathematics. This learning experience is transference from one domain to another, and transformation into countless variations in the process of artistic creation. Just as we now know that there is a relationship between the experience of various stages of crawling and the development of abstract logic (Gallagher 145), so too there is a creative connection between the experience of the relationship between the body and space and the development of the
architecture of space (Lecoq 156), line and colour, sounds and music, words and poetry, materials and imagery, in and outside of the theatre.

When I developed the curriculum for this work, I emphasized three things: an appropriate level of energy associated with the level of discovery, focus and imaging to develop spatial memory and perception, and support to develop a positive mind-body connection and real confidence. Therefore, I use the minimum of equipment. Even gym mats are used only as required. The process is a developmental voyage - a physical/psychical voyage, and the engagement with that process is far more important than end results. Training adult theatre artists, not young gymnasts, means a good portion of this vocabulary may be lost within a few years unless it is kept up with practice after the formal training ends. So the purpose is not end results but process, and that process also engages the imagination in creating.

This completes the first half of this voyage. An exploration of movement inside and outside of the body, and transporting the body in space, form one part of the process. This is complimented by a theatrical exploration, emphasizing discovery through improvisation, and the creation and presentation of original material. It is crucial to keep in mind that both of these explorations are taking place concurrently, and they are carefully synchronized. The tactile and existential imagination work together.

**Observations**

The active and engaged study of the nature of human movement is the development of proprioceptive and kinaesthetic intelligence. This supports an active imaginative process in the embodied mind. By developing a process which is not limiting the way movement takes place, but instead supports an enhanced appreciation of physical pattern logic, the dynamic
relationship between stillness and movement, the sensual connection between the body and the material world, learning the directional use of energy, and connecting the breath in a supportive manner; a new relationship between the self and the world emerges. As Damasio states, the development of a sense of self is the basis for consciousness. “… the material me… is as follows: a dynamic collection of integrated neural processes, centred on the representation of the living body, that finds expression in a dynamic collection of integrated mental processes… the self as subject [I] is… about an organization of mind contents centred on the organism that produces and motivates those contents” (Self 10). The conscious sense of self as object (me) is a basis for the development of self as subject (I) and both emerge out of representations of the living body.

Developmentally we have already experienced these connections, so the crucial aspect to this development is its connection to the creative process and the imagination. It is the utilization of a medium, a means to optimize a playful and imaginative engagement in the creative process. Focusing on discovery in a non-competitive environment maximizes the opportunities for imaginative pattern development, in an open-ended manner, by not specifying a goal. Movement then becomes a material medium for image expression, in support of the work in improvisation and presentation, which I will address in the next chapter.

As brain function, the future is imagined, even the near future; the past is re-imagined through the re-composition of memories, and conscious and non-conscious perception in the present depends on the imagination. It functions fluidly at all levels of cognition, both conscious and non-conscious. However, reversing conscious perception, reason, and critical thinking faculties to permit imaginative brain function to play a dominant role in the conscious present, may not be a simple process, after all.
Everyone possesses the potential, but the risk of losing hold of present ‘objective’ reality, and through fear, forcing the process into a problem-solving mode, may prevent or inhibit a creative engagement with the conscious and non-conscious embodied imagination. I am referring specifically to the creative process, as the imagination is certainly available to provide possibilities and alternatives on a moment to moment basis in support of everyday problem solving. In the creative process imaginative brain function needs to assume a dominant position in cognition over a sustained period. I refer to this as an altered perceptual state.

I have, over the course of this research, come to the notion that this is not as evident as one might assume. Even experienced creators, artists, inventors, and theorists seem to have ‘dry’ periods, when sustaining this creative process seems impossible to re-establish. For others, there is only a brief period in life when this happens. Inspiration is not a given. These are empirical observations based on limited experience, but it may be the case. Mastering skills may be difficult and arduous, but with enough determination they can be accomplished, and for many skills, mastery is an on-going process. Even with exceptional levels of ability, significant creative inspiration is not a given. It is a kind of cognitive metamorphosis. The creative process is not problem solving, and it provides no solutions, although solutions may result from it. It cannot be ordered by executive function. Composing associative patterns of possibilities is permitting the creative process to take place. The emphasis is on permission.

In the next chapter I will undertake an analysis of improvisation and presentation. This work focuses on the engagement of creation directly, but without this exploration of

---

32 I will pursue this line of enquiry in more detail in my concluding chapter.
embodiment, based on my experience, there is little foundation upon which to build the
encounter with the creative imagination.

The imagination is embodied, no matter what type of body, what physical condition, or
for what purpose. Embodiment is essential no matter what medium is explored, be it in the realm
of the arts with words, sculpted materials, animation, narratives, the camera, or music, and in
science with mathematics, experimentation, and theories, or in the humanities with innovation.
The creative process as brain function remains the same.
Chapter 4
The Existential Imagination

In this chapter I assert that every solution, choice, or decision made requires alternatives and possibilities to select from, and these are provided by the imagination. However, to create, discover, or invent something new requires this perceptual process to be reversed. Cognitive processes, both conscious and non-conscious, need to serve the imaginative function in the act of creation. In this chapter I seek to demonstrate this hypothesis empirically. Observations drawn from my practice suggest that risking this reversal makes individuals uncomfortable, because they are dealing with an ‘unknown’, and that is disturbing, as it risks a change in perception and possibly even a change in circumstantial reality.

In creative practice the imagination seeks to bridge a gap between what is known and what has not yet been revealed or realized. The unrealized aspect of associative imagery is often precisely what the individual needs to uncover in their creative practice. Training provides an opportunity, but it is always up to the individual to respond, and they need to be encouraged to ‘own’ those responses. Providing those possibilities and alternatives is a function of the imagination. To enable a cognitive reversal, the imagination draws upon both conscious and non-conscious processing.

I propose that one of the requirements of the imagination, in the act of creating, is emotional stimulation. When images or ideas become stimulating, they engage both the imagination and deeper feelings and memories. In this way images or ideas become active, in that they stimulate a response – an active engagement. Calmness as an aspect of discovery, as I have referenced earlier, is not to be confused with comfort. Here I refer to an energy state of suspense as opposed to an economical state, as described in the previous chapter.
According to Antonio Damasio in *Self Comes to Mind* the imagination works schematically - in patterns. They can be patterns of possibilities and alternatives (Modell 142-6), as in possible scenarios; they can be projected narratives drawn from memory recall, maps or landscapes of sensory and movement patterns, and sequences of imagery. When these patterns become significant enough, they are expressed consciously as compelling associative images. By compelling, I refer to the notion that they are significant enough to emerge from non-conscious processing to register consciously. By associative images, I refer to those patterns having an associative significance, such as having a metaphorical context (Johnson 12/13). I employ the term images because at this stage they are sensual patterns, and are non-verbal (Damasio 105). When we dream of a door, it might have associations with an opportunity, escape, or a barrier. This is sensed non-consciously. Such images create narrative patterns, or layers of meaningful associations. In memory recall these patterns are referred to as simulations or representations. In this context, creating something is not a rational ‘linear’ process, and it has no need, in its initial stages to be expressed in language. These associative images have their own ‘schematic logic’, and exploring compelling associative imagery, provides a means to engage in the creative process.

The exercises I am about to describe have engendered these hypotheses, and they have emerged from experiential observation. My purpose is two-fold, to establish principles through practice about the imagination as brain function, and to uncover the ways imaginative brain function is used in this training to create new work.

My own theatrical experience indicates that, for the imagination to work in creative practice, the individual needs to be in a state of heightened attention – an altered state, but he has to go further than that. He needs this state to be sustained. Suspension, or the sense of ‘not
knowing’ occurs before making choices, and permits compelling images to reach consciousness without interference. Interference occurs when an attempt is made to control the flow of schematic images, controlling the content consciously – by applying ‘yes’ or ‘no’ to one’s imaginings. Imagining is a schematic process and making choices is a linear patterning process and, based on experience, the linear process dominates intellectually in consciousness. When one ‘allows’ an image to emerge by making a conscious choice, the imaginative pattern is interrupted by this decision, and imaginative function returns to a non-conscious state, leaving the participant, as I shall demonstrate, with a sense that they have been imaginatively ‘abandoned’. They are also comforted by the knowledge that nothing related to their perception or circumstances has been disturbed.

The only way to discover is from a position of not knowing. How does one engage students to find this altered state? By perceiving and experiencing as if for the first time. Everything has been discovered for the first time once, and in fact most people continue to encounter people, places, ideas, questions, environments, conditions and artifacts that they hadn’t encountered before. In theatrical performance, frequently the scenario, choreography, or story, although rehearsed by the performers, is actually intended to take place theatrically as if for the first time.

There is another reason for employing a physical, emotional and intellectual state of not knowing, or suspense. Compelling images developed by the imagination are expressed in a condensed or ‘essentialized’ pattern, which is how they become compelling. They are expressed non-verbally, as sensory images, or patterned narratives, as Damasio puts it “…. the non-verbal narrative of knowing.” (Feeling 186). Because these images are condensed, they emerge into consciousness quickly, hence the notion of the moment of discovery, and the brainstorm. Being
in this heightened state of suspense/calm allows these images to be ‘recognized’ consciously, and engaged with immediately, permitting them to remain in consciousness long enough to be developed. Jacques Lecoq describes this state as being ‘disponible’, or ‘available’. In sports and in performance it is described as ‘being in the zone’ where this engagement feels effortless. Sustaining this state over extended periods is an acquired skill.

I will now continue an analysis of my practice, together with observations drawn from this study. This aspect of the training process is constructed as a carefully developed sequential series of improvisations, explored individually and in groups. Embedded in each of these improvisational themes is an experiential lesson. The lesson, or pedagogy, is not explained. It is up to the individual participant to discover this, by undertaking the exercise. Whether they appreciate the pedagogical significance of the exercise, is immaterial. Their purpose is not to appreciate the pedagogy, but to experience it as profoundly as possible, and focus on their own development. They learn experientially. Occasionally a context is offered as a reflection after the experience has taken place. This is done intentionally, to allow the participants periodically to appreciate the significance of what they have accomplished. They are asked to provide their own internal response to their experience, and are then given feedback, both by the group and the instructor, on their experience as viewed from the outside. This way they are taught to experience first, and reflect after. 33

33 When I initially encountered these exercises at the Lecoq School in Paris, I had the benefit of gaining more insight into the pedagogy, as one of my closest colleagues was in the second year, when I was in the first year, and then became an instructor of acrobatics when I was attending the second year. His careful explanations of why each exercise was being presented, and what the pedagogical expectations were, was invaluable. His name is Richard Hayes-Marshall, an Australian with a background as a principal dancer with the Australian National Ballet, who now operates his own training program in Sydney. His analysis permitted me to gain a greater understanding of the process from both sides – instruction and participation, and anticipated my own career as an instructor.
Improvisation

My purpose, as stated above, is to analyse how imaginative function influences practice, and at the same time, to analyse how practice as research may inform and develop principles about the imagination, through experiential observation. Certain of the following exercises deal with an exploration of the imagination directly, and others deal with imaginative function through creative practice. This is an active process, so the embodied imagination remains central to the exploration. The improvisational methodology remains a three stage process, involving identification, transference, and transformation, and these exercises are being timed simultaneously with physical, technical and acrobatic development, as described in chapter three.

Improvisation in this instance, is being employed as a methodology for training, and the trainees are usually encountering this work, or at least encountering it in this context, for the first time. Simultaneously, they are developing tactical skills while they improvise, and these are being established in procedural, episodic, and working memory. This is a very particular set of circumstances. The improvisations offer experiential learning as tactics, together with a discovery of elements of the theatrical process as they relate these tactics to creating new material.

Improvisation does not emerge out of an experiential vacuum. An unstructured approach is the opposite of my approach to improvisation in this context. My idea is to provide a creative structure within which the artist encounters essential aspects of the theatrical medium. The lesson is embedded in the improvisational experience.

At the same time, I employ the immediacy and expectations improvisation provides, to develop motivation, and to put the two of these together in the theatrical space. If the participant is spending most of his or her time searching for a structure, there is very little opportunity to
engage in the improvisational discovery. At times this is motivated by trying to give the
instructor what the trainee assumes he or she wants. The improvisational experience is a voyage
with an experienced guide. If the theatrical discoveries are true and the guide is honest, gradually
through the learning experience the trainee begins to trust and make his or her own way. The
participant acquires the tools to guide herself, and is then prepared to encounter a second stage of
this training process, the discovery of a personal style. Within the group the discoveries happen
simultaneously and act as reference points for each trainee. They are a collective of participant
observers comparing and analysing each other’s creations, as well as testing selected creations
publically. Public presentations act as a reminder that they are creating for a public, not each
other.

Competition with the other participants is considered as a distraction. In describing an
improvisational structure, an outline of the scenario is provided. Each participant bears witness
to the discoveries of the others, in ways that are often unanticipated. This is an important aspect
of the process. Eventually the developmental landmarks take on more and more significance
until a creative trajectory itself becomes physically and artistically clear and a direction has been
chosen by each individual.

The exercises I outline here are foundational. I am not providing a complete, step by step,
description of the entire training program. Instead I have highlighted particular exercises to focus
attention on the development of connections to the imagining process in creative practice. In fact
this is going on throughout the training process, is the overriding purpose of the entire program,
and observations I make about particular exercises apply, in whole or in part, to the entire course.
Improvisation as a medium has, in my view, a close connection to imaginative brain function and
the development of creative practice.
Once these foundational improvisations have been completed, the creator/performer continues with an exploration of style, by encountering the nature of popular theatrical traditions, not academically, and not for the purpose of reproducing them, but instead to embody them in a theatre of their own devising. This coincides with the notion that creating new material is supported by a global theatre history. The creator/performer does not, in my view, create out of a theatrical vacuum. Narrative traditions and storytelling, the family and melodrama, the tragic image, fate and power, the human comedy, the buffonesque and satirical imagery, and finally the individual, as the fool/comic figure confronting an audience directly, are all encountered, without declaring a specific cultural context, to permit each participant to re-model these traditions using their own imagery.

Eventually, once the training process is complete, these theatrical transformations are taken by each individual to an audience of their choice in a public space. Each performance with a live audience is also an improvisation. The artist has empowered herself to imagine and create her own representational reality. The training process is designed as a means to enter the theatrical profession, as creator and/or performer of original material. Alumni have applied this training successfully in a wide variety of ways, both inside and outside of the theatre.

The themes presented here must be combined with the other aspects of my process, proprioception and kinaesthetics – movement analysis, acrobatic vocabulary, physical development, and applications in practice. The co-ordination of all of these aspects is essential to the overall curriculum. It is all in the orchestration, and focus and support are always maintained.
for the group and for each individual. In this way enough trust is established to permit the risks inherent in these discoveries to be taken on a daily basis.

This relationship between instructor and trainee is both dynamic and challenging. Encouraging a dialogue also means that participants will express their views on the training itself. Does it fulfil their needs, as they see them, and are they being pushed hard enough? Students in Lecoq’s program have successfully demanded the removal of instructors who, they felt, were not meeting those expectations.

Improvisation as a medium has been chosen to focus all of the attention on the artist's growth, and not to overemphasize interpretation as the basis for artistic development. My emphasis is not interpretive training for the actor preparing to play a role in a play. I am deliberately encouraging the original creation of a living, embodied theatre and at the same time respecting the artist's own choices. As this training engages with a more ‘global’ notion of culture, language as a medium is not a priority.

The mask, in the context of this training, is a sculptural super-script. Lecoq states that: “… such fundamental things occur with this mask that it has become the central point of my teaching method… [and] This mask is a reference point, a basic mask, a fulcrum mask for all the other masks” (36). The script, or improvisational scenarios can be replaced by others, choreographic, poetic, visual, and documentary, but the imaginative functioning of the mask, in my view, is more difficult to replace. Here I refer to the representational aspect of the mask, not the masks themselves. In fact, the creative process described herein is merely an architecture for

34 It is interesting to note that while students encountered difficulties (accommodation, finances etc.), to the best of my knowledge they rarely reported being ill, and attendance was never a problem.
35 A superscript, in this context refers to a sculptural medium – the mask, which is capable of inhabiting a number of individual scripts, so it takes on a significance beyond an individual context.
creative practice itself, and it can be applied to training in the creative process on many levels, and in other contexts. To provide some examples, Philippe Gaulier, mentioned earlier, went on to establish his own training program employing much of the Lecoq pedagogy, but shifted it, in keeping with his own creator/performer background as fool/clown. Instead of the mask, he employed the fool as his mask of suspension. My own interpretation employs the creator as my mask. The super-script is the function of the mask as a principle. This is directly connected to the imagination, and I will describe this in more detail in this chapter.

There is a time when I introduce text to challenge the artist to engage in a theatrical response, but in the context of the theatrical space as a sculptural medium, not simply as an interpretation of the written word. The texts I employ are poetic, introduced by the participants themselves, drawn from their own cultural backgrounds, in several languages, often not understood by the others. I am not developing an exclusively visual theatre training process, it is simply a placement of emphasis. This textual exploration is also accompanied by parallel explorations with music, and fine art as script.

First I introduce the relationship between the artist and the theatrical space. This provides a tactical base to enable the artist to begin. The exploration is layered. The process of identification is the first stage in experiential learning. Identification must be experienced to establish meaning.

The next is transference, when a response is needed to take this identification into play, transferring experience into imagery that exists in a created space. Transference is taking experience from one domain and applying it in another. It is also taking embodiment into play, a transference from the body to the created space. The embodied imagination is the context of this training, and it works fluidly between non-conscious function and consciousness.
The final stage - transformation, is the composition of a theatrical language or style. It is the marriage of a point of view and a medium – the space and the individual. This stage is focused on responding to choices in which both critical and imaginative processing work symbiotically.

**Tactics**

I have developed tactical exercises to provide the participant with the tools to engage in improvisation and to derive the maximum benefit from the improvisation experience. The curriculum has been developed with a clear understanding of the demands of a theatrical space. Although certain themes specifically focus on tactics in an embodied learning context, in fact all of the themes contain this learning experience. Tactics are simply preparing participants to take advantage imaginatively of the encounters and the play that results in the subsequent improvisational and presentational exploration.

In this sense the artist needs to be prepared to assume a readiness to engage directly in the creative process and to derive the maximum benefit from it. This refers to my definition of improvisation as an embodied learning experience. Once basic principles of space, rhythm, energy and imaginative and emotional engagement are established, the subsequent improvisations as well as presentations can be developed and explored in more depth. It is not enough for the experience to take place, for the trainee to have ‘accomplished’ it. Simply doing the exercise without discovery taking place is wasted effort. The work must be compelling to engage the creative imagination fully. While students are not competing, they are challenging each other to go further in their explorations. Students who simply attempt to repeat what others have done successfully, usually do not complete the program. These exercises are explored in
transference at different levels of interpretation and with variations a number of times, over the duration of the program.

The empty stage space is balanced on one point in perfect equilibrium, as described in chapter three. A performer enters the space and puts the space out of balance. Another participant enters into the space, returning it to balance. This game employing the rule of maintaining balance continues with as many participants as one wishes. Then the rules are dispensed with, and theatrical play begins.\textsuperscript{36}

At one point individual movements take place with a few while the rest remain still, or groups begin to move in balance with each other spontaneously. A single performer can balance the entire group as chorus. Balance is also played vertically. It becomes evident that not only is balance being maintained spatially, but also with energy, intent, emotion, and thematically - on many levels. Opposites balance. At a later stage, the play of a chorus intensifies around compelling images. A hero and a theme is chosen from and by the chorus.

Adding dialogue changes spatial balance. Developing a relationship between what is said and what happens in the space is essential. Improvisational text is embodied. Gradually balancing the space becomes an event, exploring the play until the players begin to sense the relationship between play, space, and balance imaginatively. Objects are placed in the space. How do they relate to the space? Do they invite play or inhibit it? Is energy concentrated or dispersed? Choral movement and sound become choreography. Musical rhythms may be added, vocally and instrumentally. Each of these tactics are explored on several levels of play throughout the program, and these tactical improvisations support all of the other course work.

\textsuperscript{36} This exercise was originally developed by Lecoq to work with the chorus when he was director of the Greek festival at Syracuse in Sicily. The Greek chorus contains anywhere from 12 to 50 performers.
This exercise is employed as a foundation for training directors, designers, and choreographers as well as creator/performers. The individual discovers the plasticity of the space, and its possibilities as a medium.

Another spatial play is the play employing one's own personal space. One is aware of it even without visual contact. Initially it is interesting to find it, to get a conscious physical sense of that space which one considers personal. It is the space one can touch, like a bubble all around us. It varies from person to person. It is flexible; in a crowded subway car people can be jammed together, but they still defend their personal space. The voice that inhabits that space is a private voice. Sharing that space with someone to initiate a conversation, becomes a private conversation. It is a projected private voice that I develop for the stage.

Another improvisation about space employs two participants, one on each side of the space ‘off-stage’, facing each other. They walk past each other, each in their personal space. They both glance at each other as they pass, and they each suspect that they recognize the other person from somewhere, but are not sure. They stop, emerging out of their personal space, and turn to address each other. When they do, they realize that the other person is a complete stranger. They are both embarrassed. What happens next in this encounter is completely open, and then they leave.

A number of things happen spontaneously. They balance the stage space intuitively. They stop just beyond the edge of each other's personal space. This happens instinctively. Too close and it feels contrived, too far away and it doesn't connect. These observations come as a result of the improvisational experience, and not in anticipation of what might happen. After viewing these exercises with many different groups, repeated patterns of responses emerge, and provide a basis upon which to develop observations, and there are always surprises. There is a difference
between the everyday energy of walking and the suspense of not knowing if one should make contact. Suspense is performance energy. The shift between economical or relaxed energy and suspense is immediate and fluid.

Five participants enter individually, and sit on a bench. They are strangers, waiting. They just play themselves. They begin to find the re-play of physical adjustments, balances, imbalances empathetically and in opposition. Nothing needs to happen - no events, no catastrophes, no story, just the act of waiting. A very simple replay of everyday life. Even without characters or story line, theatrical play is possible, as the anticipation of play establishes a suspense in the theatrical space. There is no need for dramatic events, to motivate imaginative and theatrical play.

Additional improvisations are developed, focusing on the relationship between the participant and the space. Defining a public place in the city and actually observing the routine events that take place there over a twenty-four hour period, initiates a thematic presentation. Replaying the rhythms of everyday life which take place in a ten minute presentation, moves this improvisational play into the context of a performance. The space itself becomes the theme. Simply inhabiting the space provides opportunities for theatrical play. The space as narrative engages the pattern processing function of the imagination directly. This is improvisational play for the tactile and existential imagination.

**Energy**

I have already introduced the seven levels of dramatic energy: 1 - a state of collapse/chaos, when the body is simply trying to keep going and stillness is defeat; 2 – social, when the body is relaxed, in a socially generous state; 3 - economical, when the body is enclosed
in personal space and nothing is given away; 4 - suspension, in which the body is in a state of not knowing, alert and ready; 5 - tension, in which the body is dealing with the dilemma, making choices, the struggle; 6 - action, when the body is in a very engaged state, responding instinctively to emotions and circumstances; and 7 - maximum resistance, in which the muscles and emotions sustain, over an extended period, a state of maximum effort. Each simulated energy state is explored as a level of muscle energy, then as a specific level of played energy. Simple situations are employed, and the voice is engaged, as well as the play of changes from one energy state to another in an incident, such as the improvisation of passing each other on the street. These levels of played energy are explored again in the final part of the training process as embodied theatrical styles, such as melodrama and clown.

Another aspect of a tactical exploration of energy focuses on the fourth level – suspension. This energy can be explored in another context – as the creator/practitioner’s own energy. Experiencing this state is given special attention. All of this work focuses directly on the engagement of the imagination, by transferring imaginative brain function into creative skill development.

To explore the engagement of the imagination directly in play on a tactical level I employ a simple image, the daydream. A great deal of empirical evidence about the nature of the imagination as brain function can be discovered, especially as it relates to the creative process, through this exercise. It begins in the everyday world engaged in a routine physical task. Some distraction initiates the engagement of the imagination. What follows is a physical voyage into the fantastical, following the imagination wherever it goes. It is a voyage because the participant travels from one imaginative image to another, initiated physically. It is mimetic in that the voyage is without props or sound effects, but there is no need to place any emphasis on mimetic
technique. The more embodied the fantasy is to the participant, the clearer the images are to those watching it. What is being encouraged is a physical, emotional and playful engagement with the imagination, a sense of spontaneity - it is not a pre-planned trip.

There are a number of discoveries made from watching trainees experiencing the voyage into imagined realities. The moment that the participant becomes critical - says no internally to an image, perhaps because it may be embarrassing, in effect censoring themselves; their imagination stops, and the improvisation stops, usually quite abruptly. This is empirical evidence of a need for a sustained perceptual reversal, in which the critical faculty supports the active imagination, without interference. If the participant shifts into linear thinking – by making a conscious choice, the imagination as a patterning function ceases to connect with a linear mental configuration. It seems to be difficult to invent possibilities and alternatives when ‘no’ is a part of the process. Even saying yes by consciously consenting is problematic, as it places executive function as the ‘gate-keeper’ of the imagination. Only when the individual relinquishes this control does the imagination readily respond, and a genuine spontaneity emerges. This principle is taken further in subsequent improvisations with the mask. It also provides some empirical evidence for the imagination as conscious and non-conscious brain function.

The participant is in the present moment, as this is improvised, and the next image is only revealed to the participant by their imagination, when it is encountered. In fact, many times the image emerges physically in play, before the situation becomes consciously evident to the participant as imagery. A sequence of unanticipated images results in continuous spontaneity. To engage with each image physically and emotionally takes all of one’s focus. Trying to plan ahead is a distraction. If one insists on anticipating the images in this way it results in a voyage devoid
of life, as the person is distracted from the current image, and has not arrived at the next one, leaving them in an imaginative and emotional limbo.

The images are entirely embodied as they are created by corporeal engagement. In a sense, the body, in contact with the image, together with the non-conscious imagination, reveals each image to the participant only after it has already manifested itself. The participant must remain ‘available’, and must sustain this state of not knowing. These observations resulted from the responses of the students themselves, when they described afterwards what happened when they undertook the exercise. Response patterns began to emerge as these observations were repeated by different individuals over a period of years.

Occasionally trainees attempt to pre-plan or script this improvisation prior to attempting it. This quickly becomes visible, as the transitions are arbitrary. The script is forgotten once the imagination is engaged moment to moment, or there are no surprises and the imagery seems lifeless, since everything has been pre-planned. The participant needs to remain on an energy level of suspension/calm so that each image takes its own time, or the imagined images begin to speed up, and the individual appears to be continually trying to catch up to their own imagination.

When this happens images and physical engagement are frequently dropped to latch on to the next image. The imagination is searching for an image the participant can hold onto – a compelling image, but only if the participant remains entirely in the present moment. Frequently anticipation results in repetitive images like falling, spinning, or walking without end, placing the

---

37 Based on my experience, a poor performer repeats what they have done in rehearsal, whereas a good performer creates a new performance at every show.
individual in a physical holding pattern of transition, while they attempt to return to their imagined present.

Another aspect of this exercise is discovered while permitting the image to be physically present and remaining engaged by interacting with it. The participant maintains a direct physical and emotional relationship with the imagination, in play. If this is lost the voyage becomes private, invisible, and the participant becomes a passive spectator to their own imagination. The imagination seems to engage all of the senses, and empirically it appears to be sensual and active. An attempt to ‘appreciate’ one’s own imagination eliminates any suspense, by distancing the participant from himself.

If the voyage seems to have a certain detached quality, the participant has permitted physical engagement with the voyage, but emotional engagement has remained behind. They are protecting themselves from emotional engagement. The participant is doing an exercise instead of experiencing an improvisation. This imaginative voyage needs to be interactive, an imagined reality actually taking place. It is exciting, attractive and frightening and always surprising. It is even possible to transform during the voyage, to sprout wings, become a creature, or assume another role; but the participant always remains conscious that this is happening. A participant may transform, but she never loses herself. She is always present on the voyage, there is no metamorphosis of consciousness. Maintaining ownership of one’s imagination is crucial to the creative process at this stage. In the context of this exercise, a metamorphosis is an escape – this is no longer my imagination. Since participants have usually not developed the skills yet to inhabit someone else’s imagination, they usually fall back into stereotypes.

The imagery provided by the imagination is surprising, even shocking. At times it appears as if the imagination is attempting to surprise the individual out of their complacency or
resistance. This is the imagination functioning to stimulate the individual into complete engagement in the present moment non-consciously in a supportive manner. Often the more the individual resists, the more the images become ‘extreme’, and a kind of struggle emerges. From these experiences I suspect that, functionally, the imagination is entirely supportive of the whole organism – not simply the conscious part, and seeks to provide the individual with what they need as stimulation to achieve a suspension of judgement, instead of what they want, which is to remain ‘comfortable’.

A great deal may be discovered about the imagination as brain function while working with this theme. The fantastical voyage has many thematic reverberations and appears often in film, literature, computer games, and the theatre. Many of these observations will re-occur in other exercises as well. The relationship between the imagination and the creator is being embedded in procedural and in episodic memory.

Emotional memory is that aspect of memory which is imprinted through emotional experience. Emotional experience has an intimate connection to learning. Le Doux states, in *The Synaptic Self*, that: “… we are all aware from our own daily experiences that we remember particularly well those things that are most important to us, those things that arouse our emotions. Emotions, in short, amplify memories” (222). Emotional memory is rich with experience which may be drawn upon in transference in a theatrical context. The theme of present and past time, or a movement from the present into one's past must be structured carefully to avoid self-indulgence or sentimentality. This is the difference between risking an encounter with a simulated image, as opposed to employing a pretence, by merely representing the image. Such an encounter with one's past employs the image of returning to childhood.
The means is an imagined home. One is walking along a street and recognizes a door. The participant enters through the doorway and finds himself in the family part of his home, a communal space. There is no one there, no animals, simply the place itself as it was when he/she was a young child, no cobwebs, no sign of aging. He proceeds along a hallway/corridor to a set of stairs, which lead to another part of the home - the private part. He comes to a door, enters into a room, and it is the space he had as a young child. Everything is there just as it was then. He steps into his past and re-discovers an object very dear to him as a child. As he interacts with this object he goes back to that time and re-discovers that child. Something then causes him to return to the present – a reflection of himself, some audible reminder of present time perhaps. He stops playing and leaves the room, moves down the stairs, through the family area, to the door, and goes out of his house to leave the past and return to the present. It is precisely because it is carefully structured that the participant can focus all of his attention on the experience. The stage space becomes wherever the individual is in the present moment, similar to a film image. The child is present, one is not just doing childish things. Occasionally individuals stop at the point of transition to the child, as they are too troubled to continue into past time.38

This improvisation engages much deeper feelings than may be initially apparent. As the child arrives, emotional memory is re-awakened, and although the child remains behind at the end of the exercise, the awakened emotional memories go on, connected with the imagination. While this improvisation appears simple, it may result in re-awakening childhood trauma, at times inhibited from memory for years. This is rare, but it does happen, and if so, the individual needs support and immediate attention. In my experience, the group has always been very

38 This choice must always be respected.
supportive and attentive, and as a result the individual has always chosen to continue, a testimonial, in my view, of their resilience. Another interesting transformation happens later, when these individuals encounter styles. This experience provides both motivation, and context in the development of one’s own theatrical voice, often with extraordinary results.\(^{39}\) There is a dynamic relationship between emotion, memory, and imagination as interactive systemic brain functions in creating.

A kinetic dimension to emotional response occurs in improvising changes of rhythm. Disappointment tends to result in behavioural rhythms slowing down, and anticipatory excitement may cause physical rhythms to speed up. Rhythm is basic to all theatrical play, from creating material, to structuring it in the theatrical space, to performance. A single rhythm appears as no rhythm at all on stage. Rhythm cannot inhabit a space unless it changes - stillness leads to movement, and movement leads to stillness. The juxtaposition of two rhythms creates an awareness of rhythm itself. The energy level of the theatrical space is ‘charged’ - in suspense. In my experience, one cannot play in the theatrical space with an everyday rhythm, unless it is played by choice, as simulation. Works of ‘realism’ often play with the nuanced changing rhythms of the everyday in performance.

To explore this the participants find that rhythm of the everyday by walking. The rhythm is picked up with a drum beat to maintain it. Then the participants move at half that rhythm, then they double it. Once they begin to play with rhythm, they employ it in the context of an emotional situation; i.e. waiting at a train station for someone they want to see very much.

\(^{39}\) I will never forget one student doing this exercise. Her childhood was spent in a bunker underground in Lebanon during the civil war. It was remarkable in its humanity.
They rush in, believing they are late, then realize that the train has been delayed. They calm down and wait in the station. The train arrives and people disembark. Their expectations rise. They anxiously search for this person amongst the crowd disembarking from the train. Then everyone has gone. The person they were waiting for hasn’t arrived. They stop. Eventually they leave. It is all played with rhythms - including stillness. These rhythms are juxtaposed, not just changed. The play of rhythm is not just a beat, it is not routine, arbitrary or literal. Changes in rhythm must be permitted in play, for situations, emotions, and motivation to become visible. Often inexperienced performers sense these changes internally, but nothing happens visibly in play.

Finding a sense of play with another person may be a difficulty at first in improvisation. The tendency is to try to manipulate the improvisation, and to become frustrated with others when they don't pick up their cues, and co-operate. Unfortunately, others are not privy to the scene going on in one’s imagination. Basically what is going on is that the participant is trying to control the scene by making decisions, leaving her imagination behind. Often they feel clever, at the expense of their colleagues. An improvisation is an invented pattern, and it should be approached schematically and spontaneously out in the space, by everyone.

There are also those who resist passively and do not respond to an offer, any offer. They attempt to control the scene (and their imagination) passively. Two phenomena are usually taking place. The first is the search for a sense of trust - trust in oneself and then trust in others. This cannot be developed by controlling the play, actively or passively. The second is understanding how to allow the play to move back and forth, to find the ‘ping pong’ of leadership in the improvisation. Recall the balancing of the space exercise described earlier. Some trainees try to make improvisation a winner-loser scenario, and cast themselves as the
winner. It is amusing to watch some male participants deal with losing to a woman in an improvised fight scenario.

To work on responding with the senses, moving beyond passivity, and playing physically together, rhythmically, there is a simple tactical exercise of responding to five sounds which become stronger and more compelling. The response is physical, active and visible – the response of the group. This establishes a notion that acting is also re-acting. In this way initiating imagery in an improvisation can readily change hands.

Another improvisation employs a classroom, with an imagined group of ten year old children. A participant is introduced to the class by the teacher as a guest who is here to present something of importance. The teacher excuses himself and leaves, and the children remain alone with the guest. She introduces what she wants to discuss. She gradually warms to the subject, becoming more animated and eventually totally engrossed by her fascinating topic, and the success of her debut as a guest teacher. Then one of the pupils shoots a spit-ball and hits the guest teacher in the forehead. In shock, she stops talking, and attempts to regain her composure. In this improvisation the discovery is creating an active build – rising action, climax, falling action. Each participant responds to it differently, and discovers their own narrative structure as changes of rhythm.

Tactical improvisation is not a bag of tricks. The object of the exercise is to provide opportunities, not to develop an appreciation of the pedagogy. Participants may not fully appreciate or understand the significance of what they have done, but the experience is embedded in procedural and working memory and is therefore accessible in transference to other performative domains imaginatively. It is also drawn upon repeatedly in ensuing improvisations imaginatively, instead of didactically. It seems that there is a direct connection between
imagination and procedural and implicit memory which often bypasses consciousness.

Intellectual appreciation comes later. Tactical improvisations are repeated and explored with lots of variations. Once the group has grasped these tactical exercises, found a mutual trust, and a sense of play, the focus of the improvisations change. From this point forward, each of the exercises are only encountered once.

**The Mask**

Why employ this traditional theatrical device? At an early stage in artistic development, having a tangible embodied metaphor is reassuring. It is also a base for the engagement of the imagination by the creator of new material. The practical sense that the mask is played and not worn, and then can be removed and therefore separated from the artist, allows the exploration to be open-ended in that it can be taken as far as the artist is capable of going in his or her exploration, without being confused by his or her own personal issues. In this context, in my view, the theatre is not personal. It is a shared experience. The participant has ownership of her own imaginative process. Patterns of imagery encountered at one level, for example in embodied improvisation with a mask, can later be transferred into imagined presentational narratives on another level altogether – in transformation.

This mask has been called a neutral mask. This does not refer to an emotional state, but to the notion that it is not personal. It is a means to experience the stages of the creative process as embodied discovery, and the purpose is to embed in memory the imaginative neuro-plastic pathways implicit in this act of creating. In a sense all of these improvisations are embedding imaginative brain function in support of the creative process, as procedural, working and episodic memory. How do we transform experience into creation? The imaginative process is
being transferred into a practical embodied set of skills, and the skills form the raw material to enable the creative process. The mask I use (below) was sculpted in leather by Donato Sartori, an Italian mask-maker, based on a mask created by his father, Amletto, from a commission by Jacques Lecoq, shortly after World War II.\footnote{Initially it was referred to as a ‘noble’ mask. The Sartori team – father and son, were the official sculptors of the commedia dell’arte masks for the Theatro Piccolo.}

The mask was designed to be the human face at a moment of recognition and was modelled after the faces of early Greek statues, before they sculpted individual personalities. The improvisations I am about to discuss employing this mask were first developed by Jacques Lecoq at his school in Paris starting in 1956. I have continued to develop these exercises to respond to my own pedagogical goals, as I have continued to learn from the participants’ experiments.
The Improvisations

I refer here to this work as a series of experiments. The trainee experiences them for the first time, and attempts them only once. They watch each other, as they are all participants in the process, and learning to be participant observers is a part of my training process. Each time they are undertaken they are re-discovered by that individual as an embodied first-time experience. Often the scenarios are varied, and they are undertaken in a studio space without accoutrements such as props or costumes. I employ even lighting from diffused sources approximating daylight, most appropriate to working with the mask.⁴¹

This mask is a practical living metaphor, a face in the act of discovering, employed as a training device to experience the sense of first time. The mask is animated by the trainee by employing and sustaining an energy state of suspense while experiencing a series of discoveries, and the mask is experienced as self through embodiment. Damasio, in *Self Comes to Mind* states that: “… the brain can simulate, within somatosensing regions, certain body states, as if they were occurring; and because our perception of any body state is rooted in the body maps of the somatosensing regions, we perceive the body state as actually occurring even if it is not” (109). These experiences are then transformed into a pre-disposition for embodied creation. New neuroplastic pathways, I contend, must be embedded and/or reinforced to accommodate such transformations.

This series of improvisations/experiments is a lengthy process, consisting of several individual exercises at each stage. Pathways are not developed through one experience alone, but

---

⁴¹ A complete set of edited video material can be purchased through Contemporary Arts Media. It depicts my work with this mask, filmed in London with one group of my students, entitled *Neutral Mask: A Foundation for the Theatrical Experience*, shot in 2006.
through a series of experiences that work cumulatively. This is reinforced by concurrently creating and presenting pieces of one’s own on a weekly basis. All of these exercises take place in a studio and are mimetic.

**Stage 1 – Discovery**

My references to discovery and first time, employ scenarios taking place in a natural environment. Each meaningful experience happens only once. Undertaking a particular improvisation with this mask at a specific moment in time for the participants, happens only once. First time refers to a moment of discovery for each individual, a moment when neuro-pathways connect in implicit memory. With the mask this ‘moment’ can be sustained.

The mask itself may also be interpreted as embedding social norms, as it is a western face, and there is a male and a female. While this is true, it has not, in my experience, been an impediment. Participants from most cultural backgrounds, ranging in age, sexual and religious orientation, physical condition, and cultural norms have employed the mask without being prevented from having a full and unimpeded experience with the mask. The mask is not personal.

There have been attempts to create a mask which is intended to be universal in that it is not male or female. This has never worked, in my experience, because each time this universal mask is played it becomes an individual character for one of the genders. Describing the mask as neutral has been taken to mean, without individual characteristics. It is a simplified face. The difficult part is to sculpt such a face without it becoming expressively frozen into an attitude or expression. Instead, it must be capable of animation by each participant, another facet of its neutrality.
The first exercise is about the last time – a goodbye. In this exercise, an individual runs to the edge of a point of land, looks back to see an open boat full of people moving out to sea, and quite close. The person looks for an individual on the boat, a person very special to him. He sees that person and tries to get their attention. The person on the boat sees him. They wave goodbye for the last time. The boat moves further and further away until it has gone. The person is alone, he turns and goes back.

This improvisation has been chosen first for a number of reasons. With this exercise, the first experience with the mask is full emotionally and establishes an expectation of this level of engagement. Each person’s imagined experience is personal, but the mask does not become stereotypical. The last time and the first time happen once, and they are both discoveries. As a result of the emotional engagement, the mask becomes animated, taking on expressions, and creates an expectation that this animation will happen throughout this work with the mask. Trainees discover that there is no ‘technique’ associated with the mask. In one experience this exercise removes assumptions about working with a mask, and about the nature of discovery itself.

The initial improvisation involving a first time experience establishes the same level of physical and imaginative energy in a metaphorical discovery of stability, freedom, and change, embodied as the encounter for the first time with a tree, a bird, and a stream. Trainees discover the difference between an encounter, and a demonstration. Another improvised experience involves the assertion of one’s self in the world – throwing a stone into a still sea, causing the water to move. Another begins in a state of complete darkness, then the sun rises for the first time, and the participant becomes aware of a large open space all around, sees something move
at the horizon and pursues it. There are several variations on this theme of first time, and
exercises are interchangeable.

The final exercise in this sequence is a first encounter with another human being. As a
learning experience, this exercise is pivotal. It is representative of all of the exercises at this
stage, and therefore gives a sense of what takes place throughout. The exercise involves two
participants and begins with each individual separately chasing a small mammal, in forested
uneven terrain. Both of these small creatures run into a clearing at the centre of this forest, to
escape their pursuers. As they enter the clearing in pursuit, the two humans see each other for the
first time. What happens in this encounter is then improvised until both leave the area.

The shock of recognition of another human is palpable. There is no script to follow. All
familiar gestures start to feel contrived. Neither participant has control because the responses of
the other are not predictable. It becomes obvious when one participant attempts to control the
responses of the other. They are both learning to be completely honest with their imagination and
each other. The experience of suspense is intense and every movement attitude communicates, as
this suspense must be sustained. Those observing the exercise are riveted to the mask, because at
this moment its stillness is animated. This piece of leather becomes a face, a living metaphor and
the experience is unsettling every time it happens. By living metaphor, I mean a metaphor that is
capable of animation - it comes alive when in play. Metaphorical images employed in the theatre
have this characteristic.

This is a tangible experience of the other (mask) as self. Most participants who
experience this exercise state that they forget that the mask is there during the exercise, and feel
changed as a result of the experience. These observations are unsolicited, and appear to be
evidenced by all cultural backgrounds represented. Through these exercises, the sense of not
knowing is experienced, suspension is played, and the imaginative energy necessary for creating is established.

Stage 2 – The Voyage

These exercises form a narrative voyage in both space and time. Aspects of this narrative involve: a birth, early childhood, adolescence, adulthood, middle age, old age and death and consists of a voyage occurring in a single day. It begins in the ocean with the sun rising behind the participant, who is struggling with the undertow of the sea to get to the shore. A larger wave hits the person from behind and knocks them off of their feet and they are washed up onto a beach. They walk up the beach towards a jungle. They enter the jungle and move through it until they reach the foot of a cliff. They climb the cliff to the top, and see a vast landscape stretched out before them. They climb down from ledge to ledge. When they reach loose rock and step into it, the rocks move and they slide with them down the mountain to the edge of vegetation. They pitch forward when their feet hit solid ground and they plummet down the slope until it becomes gentler and they reach the bottom. They walk out onto a plain and arrive at the edge of a river. They jump across it from stone to stone until they reach the opposite bank. They walk towards the horizon. They become aware, for the first time, of the sun, which sets in front of them. It descends below the horizon, and they are left in darkness.

In this narrative improvisation with the mask, the experience is in the voyage itself. First, aspects of the voyage are explored technically – climbing, permitting the space to be wherever they are in the present moment. When they are ready, they experience the entire journey – from (metaphorical) birth to death. The complete improvisation is only done once. It is physically very demanding. The experience of embarking on an epic voyage while actually remaining in a
limited space – permits the participants to encounter space as metaphor. This connects with imaginative function. Sustaining suspense throughout, and allowing each facet of the voyage to be encountered as if for the first time is in fact the learning experience. It is not a number of surprises, but a continuous state of discovery, like a downhill skier running the course. The mask inhabits the space. Again, most participants remark that during the exercise the mask was completely forgotten. The self and the space are united in imaginative play. The individual steps out of themselves to discover the point of view of the creator. It is not enough to experience a moment of genuine discovery, this discovery must be sustained over an entire narrative, and in fact the final image is the most surprising moment in the improvisation. Usually the participant is so physically exhausted at this moment, that their ‘emotional defenses’ have relaxed and the experience of nightfall is experienced as if in slow motion, emotional but without being attached to any specific emotion.

The second aspect of this voyage is the first encounter with the elements, the forest fire, the mountain river, and a wind storm in open country. These elements are discovered by opposing them in a struggle for survival – being in the forest fire and escaping, falling into a river and surviving, and struggling to stay on the ground until the storm passes. These encounters emerge out of the voyage. Imagination and resistance, through fighting each element, as a combination are important in creating new material. Resistance is a part of the process of identification. Then, each of these element metaphors is encountered by the participants individually using their own experience as imagery.
Stage 3 - Elements

This stage involves an experience in which an encounter with an element – a forest fire, a hurricane, a storm at sea, are taken further. At the moment of strongest engagement in each of these elemental images, the image is transformed into a persona based on the element. At this point the mask is removed, and the mask persona is transformed into an individual human, with a voice, situations, and story, all improvised at that moment. Then, without the mask, the voyage is reversed, returning to the element, opposing the element, and returning to the self. The improvisation reveals that every individual relates to one of these elements more closely and without apparent effort, while the others remain both demanding and exhausting.

In this final transformative stage, the moment that the persona of the chosen element is revealed and the mask is removed without interruption, is the moment of not knowing. The participant’s face has taken on the expression of the mask. The raging fire, the wind and the sea are all larger than life, yet must be contained in human form. The experience is imaginatively empowering, and even though this exercise is physically and emotionally demanding, when the element they most closely identify with is chosen, it seems effortless, playful, and absolutely full of imaginative surprises. Experiencing the fire, at one moment childlike and playful, and the next, in a rage, destructive and mesmerizing, and then seductive, sensual, and full of poetry, all contained within one personality, spontaneously, is a watershed moment for each participant.

This narrative and elemental process can be conceived of as an experiment in that it is explored individually with no pre-set outcome. Each experience is treated separately, and relates to the participant’s own development. I have witnessed similar creative transformations many times.

---

42 The composite element of the earth is implicit in all of them.
43 I will never forget the experience of one student while at the Lecoq school in Paris. He was from Iceland, and had
times at my school. When this happens, participants not only pick up the creative process, but also their individual experience with that process. When a writer establishes the pathways associated with learning to write fiction, he or she picks up an individual approach to writing as well – a style. Each person’s imaginative brain function is highly individualized.

**Observations**

The mask is a means, as living metaphor is a means in all of the arts, and in all creative communication. It is not personal and it has no psychology attached. It is brain-based experiential learning. It is not only learning a procedural and spatial memory task, in a sense it is learning how to learn, through improvisation.

Observations that can be drawn from the improvisations/experiments include recognition that the participants quickly take ownership of the process. Because they are being asked simultaneously to transform this work into their own creations on a weekly basis, they make use of the discoveries immediately as they are transferred into their own imagery. They have all stepped out of themselves, without losing any of their individuality. They have initiated the process of becoming a creator.

The experiences enter procedural and working memory and then are re-activated immediately in transference, in their own creative process. This develops the notion of creativity.
as a skill, in the same way we employ analytical brain function to develop critical skills. In the teachings of Jacques Lecoq, weekly presentations, entitled autocours, or self-teaching demand that the neuro-plastic connectivities established with the mask, are actively re-engaged in transference. This work encourages individual and collective creativity by providing related themes that are employed as provocations to be responded to in a theatrical dialogue. This work does not employ the mask, but draws on the participants’ discoveries as they are transferred into their own theatrical creations in performance. As a result they are encouraged to develop their own stylistic voices. This re-enforces the discoveries achieved with the mask by encouraging the participants to engage with their own metaphorical voyage in the theatrical space, and to establish that this is an ongoing dialogue with their audience. Embodied metaphor becomes central to the creative process.

This also points up another important observation. The tactical exercises have functional parallels with the neutral mask through presentation. This combination is specific to this training process, and addresses the connection with the development of imaginative function in individual creative practice. This training process is not intended as actor training, but is focused specifically on the development of creators of original material. To enable this requires an engagement with imaginative brain function as its principal theme.

The Natural World

Materials

The exploration of the material world - the physical world, the world of iron, silk, paper, and static electricity, and the world of objects, on the surface may seem naïve as a study. Why undertake this exploration? We describe everything - as solid as a rock, mercurial, and slippery -
with imagery taken from our contact with the physical world. In fact it forms a major role in our descriptive lexicon. We create imagery out of experience, the experience of the senses in contact with the physical world, and we create art out of imagery. This is the process, in experiential terms of transferral and transformation. But it is extremely important not to attempt, tempting though it may be, to build a superstructure without a foundation.

Discovery through identification is the ground of our imaginative being and a basis of our adaptability and development. Recall my introduction to an analysis of movement. By focusing on the action itself, without circumstances, without individual variations, and without the object, the individual is able to discover an architecture of their physical being and the nature of their relationship to the space around them. This exploration of the material world has a parallel exploration with a physicalization of any artistic medium, whether it is marble or language, in preparation for the tactile imaginative relationship with characterization and narrative in design, choreography, and writing.

Another important consideration in approaching this work is the enormous variety and subtlety presented through each individual participant's approach to the imagery. In describing a process the variety of responses can sometimes be forgotten. Identification isn't simplistic, simply because it is physical. Care should be taken to ensure that a possible intellectual prejudice against physical experience as primitive and unsophisticated does not destroy the opportunity to experience altogether.

One of the best ways to introduce this exploration is to bring in materials - feathers, paper, iron, plastic wrap, and silk, to name a few. It is important to focus on the kinetic qualities of the material, and to keep the focus generic through a selection of examples, so that the focus is not on a particular object. I encourage a fascination with the kinetic qualities inherent in any
material. Crumple a piece of paper and watch it struggle to unfold. Participants find a physical and emotional identification with these qualities, and I include the voice. It is not simply a matter of copying the movement, it is much more than that. Participants find the directness of identification with the material, and permit a response. The exploration suggests imagery - a snowball hitting a wall becomes the image of being shot in the back. I encourage this suggestiveness with materials, finding their muscularity, their tension. Participants have all of the freedom of their own movement - it is the way they move, their muscularity that informs the image.

Then I introduce other aspects of the exploration - the kinetic qualities of light and colour, and introduce personification. An application of concurrent movement and acrobatic work with this exploration can be introduced through the improvisational dance form contact improvisation. A rich exploration develops out of an encounter with the moments of contact between materials. I then transfer this identification into imagery and play. The kinetic quality of the material is transferred through animation.

I introduce the mechanics of the movement of objects in groups - tools with moving parts, utensils, domestic apparatus. Participants explore these tactile identifications in groups. A series of objects with sculptural, architectural, and movement possibilities - a chair, plastic bags, a hand bellows, a bricklayer's trowel, a piece of plastic tubing are introduced and animated in space. A ‘puppet’ stage space is defined and a fantastic voyage through the animation of these objects is created. The space the objects create can be microscopic or enormous - the space is animated and the kinetic qualities provided by the objects suggest events and stories. The exploration of material images is then employed in transference, in situations, by employing the muscle tension of the materials to inform the physical play of characters.
One of the autocours/presentation themes associated with this work is to take a popular feature film and restage it as a ten minute presentation. A version of *Dracula* directed by Francis Ford Coppola with Anthony Hopkins and Gary Oldman was re-staged by six women using only one long piece of red cloth, and elements of the soundtrack. It was successfully performed several times publicly in London.

**Masks of Evolution**

This study involves a set of carnival masks. They are in fact imaginative eccentricities of the human face - simply a large nose, a big chin, a face of angles, miniaturized features, all with a simplification which permits an animal nature to emerge. They become caricatured, fantastical creatures. Their simplicity permits a sense that they are at a moment in their own evolution. They are, for the first time, becoming aware of themselves by noticing how they respond to the world around them. Therefore they need an environment - platforms, boxes, large pieces of foam, as well as flats or screens. The objects must be such that they are safe to climb on and explore without visual contact. Because the masks are large and exaggerated they will often have eyes that do not line up with the participant's eyes. The masks can also be used on other parts of the anatomy. For this exploration large bags and hoods are useful. The idea is to find a body that goes with the face of the mask - create an anatomy and musculature which breaks the human form and permits a creature of the imagination to emerge. There is a physical logic to the creature's body in relation to the sculpture of the mask and its means of locomotion.

The objective is to permit the creature to come to life, and not to manipulate it. The participants begin with a direct identification simply to establish creatures and find a play. They discover the relationship between the sculpture of the mask and the performer's body. Initially
there is a tendency to be very dependent on visual contact, they want to see everything. Instead, they are encouraged to use other senses. The creature sees with its eyes and explores with its senses, and responds by means of its own logic. Gradually a personality emerges, and the creature takes on a life of its own.

Some creatures have lots of mobility, others much less. The body of the creature is accepted. Initially there is a tendency for the performer to solve all of the problems the creature gets itself into. Then the creature is being manipulated and the mask is lifeless. The viewer becomes aware of the manipulator behind the mask, and the mask becomes an object being manipulated. By permitting the creature to encounter the world, have dilemmas, and struggle for its own survival, it comes to life. It doesn't have to win. Participants become wary of the tendency towards stereotypical emotional reactions - being afraid of everything, being aggressive towards everything. They find a stillness for their creature, and permit a simplicity. The creatures are naive, and it is the first time. The student must permit herself not to know and not to anticipate, so discovery is possible, through transferral onto the mask.44

Once the initial exploration has taken place and the group have seen the fruits of this exploration, two scientists 'study' them and share their observations with us verbally, treating the creatures as inferior. It is an encounter between two realities. Who is studying whom? The creatures observe the behaviour of the humans, and another aspect of the play of the mask emerges. As the creatures become more conscious of the world, they begin to evolve and their individual personalities form. They begin to assume specific characteristics, almost by imitating the humans. I then introduce padding and clothing and trainees find a human personality in the

44 I introduced these masks to autistic children, with extraordinary results involving both animation and interaction.
mask. Individuals play some masks better than others. They have a physical rapport with the rhythms and muscle quality of certain masks. A similar individual relationship has emerged with the elements and certain materials. The more the creator/performer can focus out on exploration and physical engagement, the more their own physical qualities are engaged. They are making their own individual choices. These choices are interpreted as a means, an opportunity.

**Utilitarian Masks**

I introduce the exploration of objects as mask. Utilitarian masks - hockey masks, welding masks, gas masks, garbage bags, toilet rolls; the possibilities are endless. Participants bring them to life, and discover a celebration of mask as a medium in the animation of the material world, and the ability of the body to animate the world around them through identification and transference. This will be employed in characterization, animation, choreography and text. Participants are developing a theatrical lexicon, an embodied tactile language.

**The Animal World**

The exploration of the animal world is supported by the work with the evolutionary masks and the work with materials. The objective is not to reproduce the animal's body in a literal sense, but to find the physicality of the creature, and to encounter the space from the animal's viewpoint - to encounter the world through the creature's senses and sensibilities. It is important to observe the creatures in their habitat live or with the benefit of the media, and to visit a zoo if possible. By employing the sense of discovery developed with the mask of

---

45 Some animals in a zoo however, have profoundly changed behaviour patterns - a jaguar in a zoo and in its natural environment are two very different creatures.
suspension participants enhance their ability to observe. This is the advantage of observing first hand - it is an encounter. Mediated images have, at times, taken over the active process of observation. This remote observation separates them from the encounter inherent in an experiential observation.

The first exploration is of the house-cat. I employ the neutral mask. They begin lying on a rug in a room. They are leafing through a magazine. A cat comes up and wants attention. Initially they ignore it. The cat becomes more insistent, and their attention begins to shift from the magazine to the cat. They play with it, and begin to transform into the cat playing with them. Once the cat is established, it leaves this situation and explores. When the exploration is complete the individual returns to the cat playing with the person, then the person playing with the cat, and finally the participant returns to reading the magazine.

The objective is not to show us what a cat does, not to demonstrate the cat. It is to bring the cat to life. The theatre is not simply a reproduction of life - even the naturalistic theatre, just as a film is not simply pointing a camera and shooting ‘reality’. In performing a character it is not enough to be authentic, the character must come alive. I encourage physical versatility, but these are not imitations. In a sense the performer is trying to find that which is cat within himself instead of trying to change himself into a cat – to experience the world through a cat’s eyes.

Once the key to animating this exploration has been introduced, the mask is no longer required and the exploration can be opened up. Groups explore different classifications of animals - the large creatures, elephants, whales, the large apes, a horse. Then the smaller creatures - the rabbit, mouse, a bat etc. Then aquatic creatures, and the birds, the insects, snakes and lizards can be introduced. It is much more important to explore a few creatures and actually bring them to life, than to reproduce lots of them superficially. This exploration can be assisted
by an analytical exploration of a variety of animal means of locomotion and physical attitudes, to
free up concerns about the marriage between human physiology and that of the animal world.
This exploration helps overcome the barrier of literalness in identification and permits the
participants to imagine themselves as any creature, and transfer it into play.

When a facility and life have been established, I begin the process of transference to
humans, through anthropomorphization. The participants permit the creatures' physical
personality to be transported into human form. Situations, images, encounters emerge out of the
play. When a facility and freedom to physically interpret imagery have been firmly established
and being trapped in the literal limitations of the body have been let go, it is time to move on to
characterization.

Before I continue with a description of this training process for the creator/performer, it is
useful to reflect briefly on the process itself, to clarify its relationship to my thesis. Creating
associative patterns, opening up imaginative possibilities and alternatives, and inventing
compositions shifts the emphasis onto the development of the creator of original material and
imaginative function. This animal/human interaction will emerge again in an exploration of the
human comedy, the comedic image, and the buffoon. Each of these themes produces echoes in
later work. An imaginative sense of self is being developed through all of these encounters, and
manifests itself in trainees’ creative practice on a weekly basis.

**Masks of Expression**

These masks are human. They are referred to as expressive masks because they are the
physical expression of a personality. They are also referred to as character masks. They should
not be interpreted as the expression of an emotion. If they are interpreted emotionally they
become frozen and no matter what happens they have only one emotional response. If the mask is always angry it has one reaction to everything. Therefore it is essential to interpret the mask as an embodied personality through identification. What body goes with that face? The objective is to permit the mask to come to life. The emotional life of the mask is a spontaneous response to the circumstances they find themselves in and they are capable of a range of emotional responses. Participants are asked to find their walk, and with it their sense of weight, the life pressures acting on the body, and their rhythms. I suggest echoes/references with the elements.

Their muscularity is discovered, by giving them something to do. This I connect to material imagery – a wooden, rubbery, or gelatinous muscularity. They are explored in a private, then a public space. How do they respond to each space? What is their embodied point of view? Are they territorial or are they timid physically? How do they respond to others? This exploration is associated with animals, and experiencing the world through the eyes of the creature/character.

Once the initial identification has been made, I provide a simple situation - entering into the space and looking for something, finding it, and leaving. Everyone is struck by the impression that the same mask is very different depending on who works with it. This reinforces the sense of a creative self. I set up encounters, develop simple situations - a bus terminal. One character enters with a newspaper, sits and reads. The second enters with an overnight bag, sits and waits. The third enters, sees the handbag and tries to steal it. The improvisation isn't about winners and losers. Since the masks are full faces there is no dialogue. These are three total strangers, and nothing is said. This is not a restriction, but an opportunity. The play takes place through their physical characterization and body language as individuals, not stereotypes. The situation should not be forced, nor the possibilities for play blocked. The focus for this mask is
on the sense of play through the expressiveness of the characters - the ping pong of their offer and response and its dynamic balance in play. They explore the range of the mask, and discover the contra-mask, that aspect which is ‘out of character’. They then work in groups and develop their own stories.

**Individual Masks**

Participants sculpt their own human mask. In making these masks they are encouraged to use the sculpting materials of modelling clay, plaster of Paris, and *papiér maché*. When I introduce this exercise I ask them to begin with no idea of what sort of mask they wish to make, in fact have no image whatsoever. They are instructed to simply sit down and begin, and permit the mask to emerge from their hands. I suggest that the mask should emerge from a skeleton, sculpted with muscle and flesh, weight, and bulk added. It is not a series of lines on a flat surface. Because it is three-dimensional it should be continually viewed from all angles. The mouth should be in repose, not frozen in mid-expression. When the sculpture is complete it is cast in plaster to create a negative mould, then the mask is made in *papiér maché* from that mould. Once it is complete it is painted, providing a skin tone. It is the sculpture which makes it work, not decoration.

They are all brought in together. Everyone has a look at them. The group is asked to identify each individual’s mask. It is extraordinary how each mask is a reflection of the mask maker. Each participant ‘defends’ their own mask in a presentation of their own devising. Each mask is explored by others in the group – both male and female. Encounters with the masks are explored. The masks which play together are grouped. Encounters and situations are developed
to suit each group. This is the final literal mask. In the rest of the course the mask will be
employed metaphorically.

It is interesting that this final mask is their own. It combines a sense of each of them as
creator, and at the same time as performer. A quality specific to each of them resides in the
mask. This relates to the imagining process in creative practice by taking what was initiated as a
non-conscious discovery and responding to it in a conscious manner, by suspending assumptions
to enable an invisible quality to become manifest through the mask.

The mask is a means, it is not an end in itself. Having said that, a number of companies
came out of this training and employed masks in their work. A group called Mummenshanz from
Switzerland were very innovative, using utilitarian masks, animating materials at hand. Theatre
Beyond Words from Niagara-on-the-Lake, in Canada, used larval masks as comic personas,
developing a family/community called the potato people. I used masks in some of my
productions as political personalities, to portray images of the class struggle. Julie Taymor,
director of The Lion King was a graduate of the Lecoq school, and used masks extensively in her
work.

When masks are used on stage they become a medium for the presentational aspect of
performance. The relationship between mask and puppetry, mime and ritual is evident, and
masks have a global theatrical legacy. What is their purpose in training? The mask reveals a
sense of self imaginatively for the purpose of manifesting itself in the act of creation. This has
been going on with each of the masks, and is embodied and incremental. In the context of
creation this is the engagement of the existential imagination.

By now the creative imagination has been engaged and participants have developed an
imaginative malleability, as well as permitting spontaneous engagement of the body in response
to theatrical imagery. They have married proprioceptive and kinaesthetic engagement with spatial tactics. The ability to identify and transfer imagery into their own work has become a useable, responsive, and unselfconscious medium.

**Characters**

The participants are now ready for the exploration of characters of their own invention. There has already been a great deal of preparation for this part of the curriculum. An identification with the elements has introduced rhythms - emotional rhythms. The exploration of materials has provided a basis for the development of muscle quality - the muscle relationship to the physical world. The study of animals has introduced the physical attitude to the space and others - how one views the world. This is embodied identification in transference. Along with these identifications individual images stand out – an element, a material, an animal, and these also begin to suggest a specific point of view, not intellectually, but through embodiment and the embodied imagination. The character is approached as a physical being. The personality emerges from the body, from the creator's physical choices, and the voice emerges from this physical personality.

The character's emotional life and motivations also emerge out of the embodied personality. The push and pull of the forces that have shaped each personality are imprinted in the body, in the choices made physically by the creator/practitioner. These are forces that have acted on the physical psyche non-consciously for the most part, and over long periods of time. It never ceases to amaze me just how observant we are about a physical personality, how we not only have a deep understanding but also an appreciation of the relationship between the psyche and the body. The physicalization of the character is being developed instinctively, and the
creator/practitioner is largely critically unaware of the choices which have been made when the character is introduced. This rich and subtle play between the interior life and the physical being is often untapped or misinterpreted in psychological terms by over-intellectualization. It is always fascinating to see how quickly this physical personality is found, how accurate it is, and what richness it has been invested in it. It is a testimonial to the depth of our awareness of the body, and to what level of sophistication our non-verbal communication has been developed. The mimesis of the human personality and its transference onto the stage as creations in dance and theatre are always fascinating when informed by this exploration.

This approach to characterization begins by requesting each participant to bring in a character of his or her own invention. The character should not be marginalized by disabilities or trauma which result in being a barrier to communicate, and participants should not select themselves as a character.\textsuperscript{46} The character developed should be believable enough to be accepted by society and participants are asked to come from their place of residence in character. Initially all classes are conducted in character, movement analysis, acrobatics, everything. Objections to participating - my character wouldn't do this - are set aside. Each of the characters finds themselves in these circumstances, and it is the responsibility of the creator/practitioner to support the opportunity to experience the character out of their comfort zone as much as possible. It is also important to establish that the characters are not bound by a background story, although they each have a history, but instead are living beings interacting in the present, with an uncertain future.

\textsuperscript{46} The traumatized and disabled are not being discriminated against, it is just that at this stage, the performer who makes these choices tends to hide behind this one attribute, and there are no other dimensions to their character. They become stereotypical.
From an analytical point of view the characters can be studied to develop and solidify their physicality, rhythms and changes of rhythm in their locomotion. Muscle qualities are explored in relation to the physical world, through their work, their clothing, their objects and personal habits. Each character is explored alone in their private space, and with others in a public space. What is their dynamic in groups – what happens when they compete, for instance, or find themselves in a social situation with strangers? Each situation is played, finding the opportunities and allowing the characters to encounter the unlooked for contact with objects, space, and each other. Characters are established physically instead of by their circumstances.

Each character introduces themselves individually to the group and briefly describes their background. The group then asks them questions to probe, challenge and draw out aspects of the personality which the practitioner/creator improvises - especially those details that were not thought of previously. The characters defend themselves. The participant relies on the physical grounding of their character and remains in character throughout. It is important to recognize that, with a solid physical sense of the character, the rest of the personality and circumstance plausibly fall into place. Without a solid physical base however, the character tends to collapse under this kind of scrutiny. These interviews are set up in an atmosphere of honesty and support. Each individual is defending his or her own creation.

Once all of the interviews are complete, communities are established according to class, families, circumstances, work etc. Situations are developed for each group - a meeting, a social occasion, a common threat. Encounters between disparate individuals out of their own milieu are explored. That side of each character which is out of character, when they are in opposition to themselves is also explored, the contra-mask. They explore the use of language, their sense of humour.
When the characters are established, they are all put together into a large space with one or two small objects cherished by each. Each person has their appropriate personal space. The basic routine of one entire day is played in one improvisation, queuing the time. I ask only for banal routine activities, no special events and no surprises. They develop the rhythms of a day in the life of a community.

Then I ask the participants to develop a second character, to be everything the first character is not, in opposition to the first. The exploration is undertaken a second time using the notion of the fantastical voyage described earlier. Instead of the interview, each character imagines themselves fulfilling their dream, their hopes for their future as if it is actually happening, sharing it with everyone as an encounter. As they continue, they engage physically in the process as much as possible. Then the exercise is repeated with their worst fear - a nightmare possibility from the past in their life, or the fears they have about their own future. Aspects are explored as situations. Sequences of new events and encounters with others can develop into stories, not foreseen in the character’s initial development.

Participants develop an encounter between their two characters. They select one item of clothing easily removable from each of their characters, and place a screen centre-stage. Each participant plays a scene between their two characters, switching characters as often as necessary behind the screen without losing the play of this ‘guignol’. Each practitioner justifies their character’s presence, adjusts to the play and keeps the scene moving. The creator as ‘narrator’ and the playing of characters are both evident in the presentation.

Powerful emotional images and individual themes emerge during this exploration of characters. Experientially it coalesces much of the work, but it mustn't be overemphasized. This is not the culmination of the exploration itself, only one stage of it. If these experiences are to
have theatrical significance they must have resonance. What makes a metaphor theatrically resonant? How does the compelling image become compelling? That is the focus of my next exploration.

The Emotional World

Before I introduce this aspect of the curriculum, it is important to remember that this is a theatrical exploration, and not a comprehensive analysis of the nature of emotion itself. The relationship between creative practice and imaginative development is implicit in each of these exercises, and there is a level of interpretation involved in the establishment of principles of creative practice. Le Doux defines emotion as: “…the process by which the brain determines or computes the value of a stimulus. And: “…information received by sensory systems activates emotional-processing circuits, which evaluate the meaning of the stimulus input and initiate specific emotional responses by triggering output circuits” (206).

This, I believe, is only a partial definition of emotional brain function. It is focused on emotional response to an event or circumstance, and includes emotional engagement as a result of the stimulus. This is one aspect of emotional circuitry. The other aspect of emotional brain function is what I refer to as generative emotion, which has a functional connection to motivation and embodiment. As emotional memory and experience are embedded, circuitry is established that generates emotional motivation to influence behaviour and cognition. This is mostly non-conscious, however as situations and events become emotionally charged, this system generates compelling responses, which enter consciousness. These generative emotions are connected to non-conscious volition and behaviour circuits, and can bypass conscious choices. While the individual may be aware of a level of emotional energy or excitation, they may be unaware of the
nature of the generative emotion itself. According to Damasio, feelings are responses to generative emotional states: “… feelings are images of actions rather than actions themselves…” (117). They are a conscious means to regulate emotional response, and we can be very subtle and sophisticated in the ways that we exhibit emotion. This develops what Gardner refers to as emotional intelligence. These generative emotions are what I refer to as deep feelings. They motivate behavior, often non-consciously, and over extended periods of time, often separate from an original emotional experience.

Although all seven levels of played energy are engaged on an emotional level, the emotional level of energy described earlier is the state in which the body responds to generative emotions directly without the necessity of making a choice first. Taken to another level it becomes dramatic imagery. One acts on one’s emotions and one’s personality has an emotional dimension. This is the energy level of action. I have introduced the notion of forces acting on the body, pressures, demands, life experience. They create a physical and emotional imprint. The person responds to create a balance, a living dynamic balance - embodiment. As life expectations, opportunities and pressures increase, so too do emotional responses increase. This creates a charged play between the individual and the created space. In a sense our bodies are a living physical narrative of the experiences we are having through space over time. How does this emotional experience become theatrical?

An emotional state we acquire after birth is apprehension - the fear of falling, and in a sense a part of brain function, centred in the amygdala, as described by Le Doux, is dedicated to a response to this emotional state. This leads to our optimum energy level of suspension/curiosity which seeks to be emotionally full and in continual balance. This forms a part of our hereditary
genetic imprint, and a grounding to our consciousness. When all of our senses are focused outwards, we are in balance.

Theatrically we can explore emotional states by relating them to the stage space. Fear is not static. There are many nuances or levels of fear. I divide them into five arbitrary states ascending to an extreme to develop a map of fear. Let's say they are: apprehension, anxiety, fear, panic and terror. Remembering the exercise of balancing the stage, where do each of these states exist in a theatrical space? This created space is not literal but metaphorical, it becomes the spatial reality of an emotion – an interior map. I do not focus on a specific stimulus or response, this is not a situation, or a story. Where might a state of terror exist in this interior space - at the edge, in a corner, in the centre of our being? Is it up high or down low? Is it transfixed or in movement? Is it balanced or unbalanced? The group physicalizes this map of fear, a reflection of emotional mapping in the brain. The stage space itself becomes an internal space, beginning with calm hypothetical individuals in the centre, in balance with their environment. As the group move from one emotional state to the next, a spatial narrative choreography emerges.

I explore other emotional states such as love, shame, anger, and jealousy. Engaging the space metaphorically enables imaginative play. Each emotion develops a specific interior trajectory and a sculptural relationship to the theatrical space. Together they create a charged space and an apprehended state of being, but in a sense they are latent and they preview a much deeper aspect of the emotional study. This map may become the emotional narrative trajectory of an individual, or a piece of choreography or the events in a story of a community.

Deep feelings initiate responses themselves, without context. These deep feelings can be the engines of behaviour over long periods of time. Mostly they are in the realm of the non-conscious, and one is not aware of their influence. Since they are in the realm of the non-
conscious, a principal response to them is physical. Emotions are not necessarily negative forces. Deep feelings also get one going, move one to act. They may be revealed in conscious acts in moments of crisis, but they continually exist. Each emotion, or combination of emotions, has a narrative, and what makes the subject matter of a dramatic or comic piece compelling, is the chronicling of that narrative.

To some of us even the names of these deep feelings suggest negative connotations – hate, jealousy, lust; and we may view them with a certain moral disgust. A study of emotional imagery may consequently become negative. It is crucial therefore, that an engagement in this exploration is undertaken with an open mind and suspended judgement. This is also in keeping with this research. Deeper feelings are forces and they can be directed positively or negatively. Without fear courage is inaccessible.

It is hard to isolate one emotion, because we are moved by many. Deep feelings initiate events. This theatrical exploration of emotions began with an exploration of the elements. There is a connection between physical identification with element rhythms and the rhythm-play of emotions. Deep forces act on us all; pressures in the struggle to survive, inner pressures in our relationship to the world around us. We respond physically to these forces. Deep feelings are external as well as internal. Deep feelings propel events in the public as well as the private sphere.

The vertical, horizontal and oblique lines of kinetic geometry emerge. There is a constant and ever-changing relationship between the individual physical personality and the charged space. Sometimes the focus is on the response to outside pressures - being shaped by emotional experiences, and at other times are motivated by the forces acting from within – one’s influence
on events. It depends what direction these pressures are coming from and the degree of agency expressed by the individual.

Just as with the mapping of the ascending states of fear, there is a trajectory of an emotion in the space. Participants map that trajectory, a reflection of the interior mapping of brain function. I concentrate the play by limiting the space. Groups transfer the choreography into relationships and events. One event scenario that developed was: a goodbye, a betrayal, a discovery, a reunion, and revenge. Participants permit a story to emerge, add text and context and present it. This is a kind of melodrama laboratory. Stereotyping and caricaturing emotions is restricted at this stage and instead a focus is placed on the movement and play of the body in space. The play emerges in an unsentimental fashion as it is being viewed from the outside, by placing the emotional narrative in the animated space. The imaginative relationship between the creator of emotional metaphor and what is being created is an interesting exploration, especially when being studied from the perspective of imaginative brain function. It may be characterized as a point of view, related to the sense of a creative self.

I transfer this exploration, trying not to systematize the discovery but instead engage in a play of the emotional landscape and bring it to life through the medium of the body. The sense of active energy becomes evident in the concentrated play and the emotional image emerges. This exploration is related to the work on characters and also on the chorus, and I encourage participants to transfer their characters’ stories by presenting thematic biographies.

By employing a logical shift, these images become dramatic or comedic. In a dramatic image the deeper feelings become conscious premonitions or instincts, motivate events, which then have consequences. In the logic of comedy, based on my experience, there are events, consequences, and finally a realization - or not. Both exist on the same level of emotional
energy, involving a level of ‘blindness’. What makes this study relevant to creating as practice is
that the emotional study is undertaken from an outside perspective, enabling an engagement with
complex imagery and imagining very ‘uncomfortable’ and complex event narratives. Recent
discoveries in neuroscience suggest that the embedding of emotional memories may be
asynchronous: “What seems to me to be necessary to emphasize in the future, far more than we
have in the past, is the apparently ubiquitous asynchronous operations of the brain” (Zeki 11), so
that the imaginative replay of such imagery may display asynchronous patterns in its
contextualization and development. The replay of emotional imagery is often layered.

The Imagination in Play

Painting, Sculpture, Poetry, and Music

These aspects of the theatrical exploration are introduced concurrently. The objective is
not to appreciate poetry, sculpture, painting, or music although that may result, but to extend
further into transference by exploring the physicality of the literary, visual and auditory
imagination. This work comes directly out of the exploration of the imagination in the fantastic
voyage exercises. When members of the group come from different cultural backgrounds and
different language groups, art, literature, and music are introduced from these cultures.
Reproductions of the work of established artists from a variety of cultures and from a variety of
periods in time - the stronger the material, the more dynamic the transference.

A painting, a sculpture, a poem, or a piece of music, is not being interpreted, but is
characterized by transferring the life of one medium into another. The emphasis is on
discovering a theatrical language with a vibrant life of its own, without visible reference to the
source. This part of the voyage brings into sharper relief the process of identification, transference and especially transformation.

A poem is read aloud and participants improvise a choreographic response – a fantastical voyage. What spatial architecture does the poem occupy? What rhythms/elements/materials are present? What muscular energy and resistance does it have? The relationship with sound and voice is explored. Participants find patterns in the choreography and material which recur. By now they are capable of maintaining a degree of separation between themselves as creators and the material they are working with. They do not become the music or the poem. They select themes drawn from their improvisations. The imagery is shaped and finally, a choreography is set.

This work is very physical and imaginative. It is not an intellectual interpretation of the poem and it is not descriptive. They are not interpreting, nor is this an opportunity to become unfocused, but instead it is an important development in trusting physical perception and non-linear schematic intelligence through the imagination. A poem is not a how-to guide. Imagery accumulates, rhythmic, colourful, audible, tactile - sensual play is evoked through the words. In a sense poetry is the physicalization of language. Once participants have initiated the process, they explore this work using languages they are not familiar with. It is surprising how sophisticated they are with the meanings, themes, and changing rhythms expressed in poems they don’t understand linguistically.

In preparation for the exploration of painting I explore colour and light. The stage space is divided according to the parts of the pigment spectrum - violet, indigo, blue, green, yellow, orange, and red. Participants plot a passage through the spectrum. The distinct movement, spatial and kinetic qualities of colour are explored.
An identification with light begins by exploring the light of a candle flame, a fire, the sun, the moon, and lightning. Participants explore artificial light - a spark, an arc, incandescent, fluorescent, a flashlight, a laser, a flare. They find the play of light and shadow, exploring the play of shading, and the play of line. Paintings and photographs are introduced and they bring in their own selections. Each painting creates a space and follows a voyage of the eye. They transfer that space and that voyage onto the stage space, and explore sound and voice - some paintings are silent and some are full of sound. Participants select, identify with and transfer a painting onto the theatrical space, and present it.

I use identification with materials to initiate an exploration of sculpture. This may seem quite abstract, leading to a lack of definition, but in fact it is quite accurate and eventually the source itself is no longer necessary as a reference point. By this time the trainees have gained a high level of confidence in their imaginative ability, and are very comfortable with a sustained altered perceptual state. They trust their imagination, and are unafraid to follow it without knowing where it will lead first.

Music is a vast exploration in its own right. Therefore it is necessary to select within a variety of possibilities. For my purposes I choose to work primarily with instrumental music, and there are certain composers who lend themselves more readily to theatrical interpretation. In the end this is a matter of personal choice and experience. There is no attempt to encompass a musical panorama, selections are being made as examples only, to establish a means of engagement. The relationship to the music is neither dance nor expressive movement. The encounter maintains two separate entities - the soundscape, and the body in space – the creator and the work. The imagination leads the process, not the music.
The initial exploration is a physical identification. After observing this identification three movement responses begin to emerge. The first is being active with the music, almost as if the music can be moved, and the movements resolve down to pulling or pushing the play possibilities in the music. The second relationship to the music is in response to the soundscape and the individual is being pushed or pulled by the different spatial qualities in the music. The third is a kind of mirror in which the music soundscape is reflected by an interior state - a push and pull within the body, a kind of interior struggle or play. In all three the relationship is distinct and separate. They do not 'become' the music.

Natural undulatory movements do not respond well to the physical play in music, they tend to become unfocused, so participants find a more resistant muscle quality to keep the relationship to the music more distinct. These three experiential relationships to the music can be taken into transference. In play these relationships overlap.

Synchronicity is a play which develops employing the musical structure. I select an everyday situation - getting up in the morning. The music starts, and the participant is getting up and preparing to start their day. Both getting up and the music are distinct and separate images. There is no music playing. The action of getting up begins to employ the punctuation in the music, as if by accident, and not continuously. The two separate images become synchronized, yet remain distinct, in play.

In counterpoint the play is directly against the music. If the music is fast and light, they are slow and heavy. In direct physical identification this exercise helps the participants gain a physical self-assurance in relation to the music. It is not overwhelming. They can maintain an image separate from the music and still identify with it. A dynamic conflict emerges between the
music and the play, which is very exciting and can be employed in relation to other improvisations.

Presence is the play resulting from an identification with the musical composition. The participant is writing a letter in a house. The music enters as a presence, colouring the situation. The participant responds to the music imaginatively - it creates images relating to their circumstances. These images may create a story with an interior focus, or an exterior set of events via any of the senses, and has strong echoes of the day dream exercise. Again the images remain distinct, there is the music and the internal narrative.

In animation the music is a force or personality which enters directly into the play. The performer is actively engaged in a task - packing up to move. The music enters and begins to 'help'. A play develops directly between the performer and the musical stimulus. The music can be animated further by appearing and disappearing at appropriate, or inappropriate moments. A second person can enter who is completely unaware of the music's presence. It is crucial to maintain the activity as a basis for the play.

Ambience is a parallel relationship to the music. A person is waiting for a bus, and it begins to rain. A second person arrives in the bus shelter. The presence of the music begins to reflect an interior state in the two individuals - a struggle in response to the situation both exterior and interior. They had a relationship, which ended badly. The connection with the music is physical/sensual, it is not dance or mood or background. These two individuals see each other. The changes in the music impel the stage action forward. Both the music and play maintain their individual integrity. The musical soundtrack in film often uses this relationship.

There are other explorations and these relationships can be developed further, but there is an underlying principle essential to the process of experiential learning itself contained in this
exploration. It applies to all of the experiments/exercises. The individual creator/practitioner never `disappears' in the imagery. In a voyage into the imagination one always maintains a presence on that voyage. In the identification with the element of fire the physical identification is contained and coalesced into a persona – and the persona belongs to the performer, not the element. This is the creative dialectic of the theatre. The push and pull of the play in the theatrical space cannot exist without two counter points. The process of identification and transference is transforming into the development of a theatrical language - a style. Style is completely personal. It is the creation of the artist, and this work is all about the artist as creator. Style cannot exist by itself, it is a reflection of the creative self.

Parallel and in tandem with all of this experiential improvisation is performance. To create a dialogue with the participants it is essential to challenge every pedagogical offer with a creative response - theatrically. Creative practice is a public dialogue.

Presentation

This experiential learning process would be self-defeating if it did not have as an essential and continuing central aspect theatrical presentation. The exploration is the offer and the participants' presentations are the response. It is active both on the part of the instructor and the participant. The themes chosen for presentation associate and engage the identification and transference outlined already. The intention of each theme is to challenge and provoke a theatrical response. Cumulatively they illuminate a transformation of the experience into theatre, and the emergence of personal styles of performance. Periodically, selected presentations are collected together into a public presentation of the work, to keep the participants' theatrical focus out on a larger spectatorship, and to establish creative contact with the community as a whole.
Presentation is a course in which the participants teach themselves, and take ownership of the experiential model. They each develop their art in a direction harmonious with their abilities, honest to themselves as artists, and original. Within this framework they acquire their craft as creators of new material.

A theme is provided at the end of each week to be presented at the end of the following week. Most themes are developed in groups. Each theme is a provocation, and the participants respond theatrically. Themes are not explanations. The intention is not to get an expected response but rather to elicit the unexpected - the participants’ own imagery, and to have them defend that imagery in performance.

The themes themselves are designed to challenge the participants on all aspects of the exploration – a biography of a character, an audition of an element, the invisible becomes visible. They are a means to transfer identification with imagery into play, and even begin to establish the transformation of play into an individual point of view. This point of view, both conscious and non-conscious is already being established before the engagement with theatrical styles begin.

In responding to these presentations it is important to clearly state what happened, not what should have happened. It is essential to keep focused on the piece, and remain honest. Each of the participants is risking a great deal and it is crucial to treat each of them with respect, in proportion to the risk taken and their ability to bring it off. Periodically a selection of these presentations are performed publicly. It is important for everyone to remember that the public is their audience.

In addition, at the end of the course I provide each participant with an individual theme to provoke their own response. They can use others in their presentation, but they provide the
artistic vision and develop every aspect of the presentation themselves. I also require each individual to present a piece of original choreography derived from movement studies and acrobatic phrases.

**Conclusion**

I have undertaken this enquiry, not with the intention of providing a step-by-step analysis of physical theatre training, but to develop a pedagogical model, an approach to the learning process developed from empirical research into the creative imagination as brain function. I have provided descriptions of practice to assist in elucidating this training trajectory. Many of the exercises are powerfully focused and provide a deep learning experience, but the exercises themselves can be replaced by others. There is lots of room to explore, but there is a lesson in each of them, something which taps into a deep unspoken appreciation of the theatrical and an embodied performativity.

The imagination as brain function is employed in the creative process to embed creation as a skill in procedural and working memory. It is then transformed into the participants’ own work. A reversal of cognition, allowing perception to support the imagination is essential to permit the creative process to occur. It is embodied through a connection to the theatrical/metaphorical space. Stillness leads to movement, literally and metaphorically. The trajectory of the creative process is identification, transference and transformation. Imaginative brain function consists of possibilities, patterns and composition.

In a sense it is a provocation, a provocation of the process of learning, to advance the process itself. This pedagogy and the results of this training process have stood up to scrutiny and critique from both the theatrical profession and a global audience for over sixty years. An
analysis of practice provides a key to the principles behind the pedagogy, but it is only a part of the whole structure. It deals with the process of identification, transference, and transformation in a theatrical context.

As theatrical training, this course of study provides a foundation for a more thorough exploration of theatrical traditions – the chorus, mimesis and puppetry, the human comedy, drama, realism, storytelling, and clown. It also deals with experiential learning and the structuring of space for design and architecture. It takes the creator/practitioner from identification to transformation and the development of a personal style.

Can the imagination be developed, and can the creative imagination be educated? Since creation is a skill, I believe that it can. The creative process is the principle asset of our existence. It is our responsibility to husband it and encourage it. The promise of the imagination is that it permits one to perceive that which is not evident, to know the unknown, and to uncover the invisible. In my final chapter I will return to an exploration of the sources from which I developed my observations about the imagination as brain function, to establish principles of imaginative function for use in creative practice.
In this chapter I review the principles I have established in both creative training practice and in an analysis of aspects of imaginative brain function. I expand on these principles to augment their significance with regards to the creative process itself and tie both strands of enquiry together. My purpose is to provide some conclusions to this study, and suggest next steps in ongoing research.

When I began this study in 2009, the imagination as brain function wasn’t on the map. Neuroscience was not in a position to consider such a complex system, and there were still sceptics who were not comfortable with its existence as an autonomous brain network. Now the field has completely changed. The imagination is recognized as an autonomous system in the brain. It is beginning to be studied with more intensity, because of new developments in relevant technology. New fMRI applications, in which images can be viewed instantly in real time are now available. This enables scientists to observe more complex neural activities as they take place in real time as well as gaining access to a more detailed model. In the immediate future the advent of holographic fMRI will revolutionize this process even further. This will be enhanced by complex computer modelling of the virtual brain, including recent discoveries concerning asynchronous processing with concomitant programming applications currently in development. A more thorough scientific study of the imagination is just beginning.

I will now establish some principles about the imagination, by endeavoring to bring together my evidence-based scientific study together with my observations about the imagination drawn from creative practice. I will then present observations concerning creative training
practices in general, employing my reflective analysis of specific training methods described herein as a foundation, based on my practices in the theatre.

As a result of the rapid changes taking place in technology and complex system research, defining the imagination is a labile undertaking, as it is a moving research target. From a scientific perspective, the attempt to isolate imaginative function in the brain has proved elusive, since the act of imagining is not a singular process, but instead is a highly complex interconnected network of brain activity, functioning on both a conscious and non-conscious level. When I refer to brain function in this context, I mean a complex neural network established to carry out a variety of action potentials on behalf of the entire organism. It is in this context that I employ the term, as the manifestation of an electro-chemical process of complex coded neuronal transfers employing aspects of the one hundred billion strong neuronal network of the brain, and employing selected encoded combinations of the one thousand five hundred possible protein codes available. As Damasio states in *Self Comes to Mind*:

Changing the state of other cells is the very source of the activity that constitutes and regulates behavior, to begin with, and that eventually also contributes to making a mind. Neurons are capable of this feat because they produce and propagate an electrical current along the tubelike section known as the axon. (40) … That is the purpose of neurons and the purpose of the brains they constitute. All the astonishing feats of brains that we so revere, from the marvels of creativity to the noble heights of spirituality, appear to have come by way of that determined dedication to managing life within the bodies they inhabit. (41)

I have argued that imagination as brain function is not only connected to the senses, but is also connected to the emotions, memory and the non-conscious and conscious cognitive systems. Combined with memory, the imagination provides a grounding for an altered state experience, a
suspension of judgement, a state of not-knowing or discovery, in support of the creative process. Imagining is brain function with a global applicability, and creative practice is a specific outcome of imaginative function, engaging the means, skills, and experience employed in developing original material for theatrical presentation.

In this thesis I have focused on how imagery, developed at a non-conscious level becomes compelling enough to reach consciousness. Stimulation is provided by neuronal electromagnetic transmission of the representational mapping of the senses, and is an embodied process. Sense-related imagery is the lexicon of the imagination. Stimulation as an altered state phenomenon engages the imagination directly. The imagination connects this stimulation to a non-conscious sense of self, provided by representative systemic mapping phenomena to initiate compelling images. These compelling images engage a conscious response, and initiate an active outcome.

I have argued that the imagination, in the act of artistic creation functions on both a conscious and non-conscious level simultaneously. Therefore, attempting to study the imagination in creative practice as a conscious process exclusively captures only a portion of the entire activity. I have already described the increase in neural activity associated with an unfocused default mental state, and studies have shown that in the meditative state there is a substantial increase in electrical activity in the brain. This suggests that once the focus of mental activity shifts away from immediate conscious demands, there is an increase in non-conscious activity. Perhaps this is closely related to the engagement of imaginative brain functionality at the non-conscious level. The findings of Limb and Braun studying brain function with jazz musicians in the act of improvising, as well as the work of Custers and Aarts, on non-conscious
volition taking place during consciousness, as referenced earlier, seem to support this observation.

My definition of imagination has included one aspect of quantum theory – referring to multiple dimensions, altered states, and time as a spatial concept. Gupta and Markan state that: “The quantum regime can be exploited for increased efficiency in learning and adaptation and hence better survival. Human brains are most suited to exploit the quantum regime and hence are at the apex of conscious awareness by being aware at all three levels – physical (body), mental (mind), and subtle [level of frequency]” (45). A quantum analysis of brain function is a contentious aspect of neuroscientific research, and therefore I have referred specifically to an application of quantum theory, employing holography, as an analogy.

Holography has been useful in providing a context for multi-dimensional altered states as brain function. Holography provides an external visual reference to an internal process, employing a cognitive reversal (comparable to holographic image reversal), which is necessary to engage the imagination in creative practices, a tactile construct. The theatre stage is capable of limitless representative realities. It is by analogy, a quantum space – a space of multiple dimensions and parallel worlds. Creatively animating this space is, in my view, a holographic process.

I have introduced three types of imaginative brain function: the provision of possibilities and alternatives, the processing of associative patterns, and the composition of associative patterns and possibilities related to synaptic plasticity, and to sensory, emotional, physical, and perceptual processing. I suggest that these three facets of imagining are highly interactive as well as engaging with other principal brain functions – especially emotion, memory, and the senses, and operate as a system in the brain, which can be characterized as a connective network. Such
connective networks are now being revealed with regards to language acquisition, in part, due to enhanced holographic fMRI technology.47

The provision of possibilities and alternatives to enable conscious cognition has been documented by Modell and Byrne, as referenced earlier. Every choice, decision, plan, and conclusion has been supported by offering possible and alternative outcomes, to permit each choice to be made, at both the simplest and at the most complex levels. This takes place on a physical, intellectual, emotional, social, and practical level.

The provision of possibilities and alternatives also takes place at the non-conscious level. My analysis of proprioception and kinesthetic movement in chapters two and three offers examples, including co-ordination, movement sequencing, and responsive possibilities and alternatives in corporeal scenarios. The brain’s considerable representational imaging capacity at the systemic level in response to every eventuality, both internal and external attests to this capability. This capability relates closely with the human organism’s adaptability, even at the epigenetic level, as described by both Changeux and Llinas earlier.

A reversal of this supportive process, in which cognition now supports imaginative function, takes place in response to discovery at every level. Permitting a suspension of judgement enables possibilities and alternatives to take the lead functionally. Such mental activities are not necessarily providing outcomes or solutions, as this is not problem-solving. What the imagination provides is patterns of possibilities.

These imaginative patterns have associations, via the relationship with the senses, emotion, and memory. Damasio has already described the brain’s ability to develop representations. I have introduced mirror neuron system theory and its ability to develop reflective and mimetic patterns. Neural reuse and mental workspace theories suggest complex interrelated etymologies between procedural and episodic memory, and the development of abstract patterns, for example between memories of the past and possible futures.

The future is entirely imagined. It is composed of patterns of possibilities. The future is embodied, emotional, suffused with experiences from the past, and at the same time it is entirely imagined. What better example of the nature of the imaginative brain system can be offered? Imagining the future employs associative patterns of possibilities, and because the future has not taken place it is a suspenseful phenomenon. It is emotionally engaged, as it is invested with a level of anticipation brought on by both hopes and fears. It is also informed by associated experiences drawn from the past. In a sense the future is composed out of the past, informed by discovery and supported by the sense of not knowing. This is closely allied with creating new material for the stage. Creating possible future scenarios for oneself, whether in regards to an immediate event, or concerns about life choices, is closely allied to creating possible scenarios for theatrical presentation. In that sense, everyone has the capacity to create.

Imagination as a complex system is pre-disposed to engage with both memory and emotion, in the production of mental activities in the past, present and in the future. The distinction between brain function and activities employing brain function – sources and outcomes, is central to this study. I have therefore included the relationship between non-conscious emotion and conscious feelings, between non-conscious volition and conscious reasoning, and between non-conscious imagining and conscious creating.
Composition is perhaps the most contentious of imaginative functions. Composing possible scenarios also involves critical judgement, comparing compositions with past experiences to re-enforce a sense of ‘truth’ or a notion of ‘reality’. When an actor composes a character, all of these elements are engaged, even though the character may be entirely imagined. This reveals the necessity of a cognitive reversal in creative practice, in which the imagination dominates perception. It does not mean that all of the other capabilities of perception are removed, they are simply supportive of the imagining process. It also re-enforces the concept of suspending judgement, permitting the imagination to dominate by relinquishing executive control.

A compelling example of imaginative composition occurs when recalling long-term memories. Long term memories are categorized as memories of informative knowledge established beyond a thirty second time frame. The act of recalling memories is an imaginative process. Traces of remembered experience are employed to re-establish a memory, by re-composing it. Damasio states that: “… cell ensembles at the top level of the processing hierarchies would not hold explicit representations of the maps for objects and events. Rather, the ensembles would hold know-how, that is, dispositions… the disposition was commanding the process of reactivating and putting together aspects of past perception” (Self 150). Damasio describes these disposition ensembles as divergence/convergence zones. Schlegel et al state, with regard to an imaginative mental workspace, that: “Human cognition is distinguished by the flexibility with which mental representations can be constructed and manipulated… this ability is

---

a key role of a global neuronal workspace that in part realizes our conscious experience… [they] mediate the flexible recombination of mental images” (16281). In my view, these observations are initiating an acknowledgement of the presence of systemic imaginative function, as an essential part of memory recall, and visual engagement. This permits memories to be updated with reference to current conditions, so they can be accessed in the present moment.

It also attests to the incremental nature of remembering the past. The re-composition of memory provides an excellent and compelling example of imaginative processing at work. Patterns of imagery are recalled from mapped sequences, and composed into complete experiences for use in the present and in imagining possible future scenarios. When the imagination is considered in this way, it can be removed from the notion of fantasy. Since this word connotes a separation from conscious perception, using it makes it difficult to consider the imagination as a complex interactive system, engaged in the composition of our current subjective reality.

Another aspect of composition relates to patterns of movement. How do movement patterns become choreography? Choreography is the composition of patterns of informed movement. These movements, including rhythms and punctuation, are informed by imaginative associations. These associations communicate with others as meaningful and compelling compositions. Movement is suggestive, connotative, representational, and evocative. The composition of associative movement patterns is both practical and relational with spatial, audial, affective, tactile, and experiential sensibilities. A choreographic composition may be improvised or highly structured, so many aspects of brain function are engaged in an imaginative mental workspace process to realize such composition. I present this as an imaginative process because it is dominated by imagining possibilities, invoking patterns, and creating meaningful
compositions. Although choreography provides an immediate visual engagement, this same process can also be associated with the composition of musical, visual, sculptural, and literary structures.

The three stages I have established, concerning creative development: identification, transference and transformation, have a correspondence in the three aspects of imaginative brain function. Alternatives and possibilities associate with identifications, pattern development associates with transferences, and composition associates with transformations. This embodied process has a built in adaptability. The body cannot be directed or managed by conscious thought alone. It therefore has a natural affinity to non-conscious emotional, memory, and volitional processing, and a natural connection forms between the body and the imagination. Imagined patterns are readily animated in the material world.

I have defined identification as relating identity, a sense of self, with recognition, by modeling the outside world, through embodiment. An affective response, combining the sense of self and the modeling of the world together, enables compelling possibilities as a stimulus to create. Grounding creative development as an experiential process, through improvisation, provides a foundation flexible and adaptable enough to engage productively with identification in creative practice.

Identification requires a state of mind which I describe as a suspension of judgment, accompanied by an engagement and readiness. As a dance choreographer, Zollig states in *The Neurocognition of Dance*, that: “To find new ideas, new movements, I have to break out of routines, to free myself from set ways of thinking and seeing. Otherwise I shall never be able to discover that which lies hidden beyond the known” (117). This state of ‘not-knowing’ is an altered state of mind in which perception supports the imagination, a cognitive reversal. Modell
states that: “Identifying with the other rests on a paradox – that one is similar to the other yet one remains oneself. One must be able to accept the paradox of something that both is and is not” (176).

Engaging the creative imagination is not a comfortable undertaking. Compelling possibilities are often unanticipated, shocking and deeply unsettling, or stimulating, as they stimulate the individual to respond. In my view, imagining engages many levels of non-conscious and conscious processing at the same time. Since imagining possibilities is image-based, it is composed very quickly as a pattern process. This image-making and associative mapping is the act of placing one’s self in some relationship to something, by identifying with it. This act not only makes the object/subject visible, but the viewer also becomes visible in relation to it. One recognizes one’s self when one recognizes the other, via a ‘mirroring’ process of the imagination. Kemp states, in *Embodied Acting* that: “The recent discovery of mirror neurons [49] provides an account of the way that the neural circuitry of motor activity is involved in empathy, emotion, and responses to fiction” (130). I acknowledge this connection between imaginative composition and reflective and mimetic processing. By reflecting a sense of self in relation to the compelling image, each artist develops a unique style, or signature. The ability to identify compelling possibilities as opportunities for creation is not a conscious choice. In fact, as I have stated, based on my teaching experience, choice is not part of the process at all.

The transference of compelling images into a narrative or sequential associative structure requires a discharge of emotional and creative energy onto the creative process. This transference process happens by means of a conscious interface with non-conscious stimulation, together with

---

49 Mirror neurons were first discovered in macaque monkeys by Rizzolatti, Gallese et al in 1994, and a so-called mirror neuron system is thought to exist in humans, located in the limbic system.
engaging the skills and experience of the creator, in developing compelling imagery into an open-ended sensual/embodied narrative structure. This process exists on three levels, the physical, relating the imagery to a space, the presentational – the compelling image compels a response, and the metaphorical in which the imagery extends ripples of meaning beyond its principal stimulus. Current research by Adrian Owen and others has shown that:

In recent years, rapid technological developments in neuroimaging have provided new methods of revealing thoughts, actions and intentions based solely on the pattern of activity that is observed in the brain. These methods are now being employed routinely to assess residual cognition, detect consciousness and even to communicate with some behaviorally non-responsive patients who clinically appear to be comatose or in a vegetative state. (*Lancet* 2091)

This is dramatic evidence to demonstrate the complete and uninhibited connection between non-conscious and conscious cognition, and re-defines the nature of consciousness itself. It demonstrates the veracity of my observation about the relationship between non-conscious imagining providing compelling images as conscious metaphoric stimulation.

Transference is also the ability to take experiences, images, and discoveries from one domain to another. At the level of brain function, patterns of memory, emotion, and metaphorical perception are adaptable in association with movement, the quantum space, tactile, audial, and visual stimuli. Patterns of mental associations become patterns in space and time in the external world. Discoveries made with a mask of suspension during an improvisation, are transferred into creations and the presentation of original material. This capability is central to the imagination as brain function, and central to creative practice.

When developmental neuro-plasticity connects systemically, a transformative experience occurs. Neuro-plastic pathways in the imagination employ embodied procedural memory. This
has been described as engaging craft, skills, and experience to support the creative imagination at all levels of activity. When transformation takes place the creation is revealed, to stand on its own. Imagined possibilities are transformed into physical, and virtual realities. Modell states that: “… the difference between a metaphoric process that merely transfers meaning and a metaphoric process that transforms meaning can be attributed to the contextual complexity that has been added to perception” (147-48). Development, once a piece is conceived, becomes interpretive. Transcending its own formation, the creation becomes more than the sum of its parts. When discoveries and creations resonate, they acquire additional significance.

Transformation involves the composition of a personal style. The composition of individual pieces becomes a composite expression of a specific point of view. In my experience, the individual compositions come first, and they resonate metaphorically beyond their content, to become an expression of a specific way of experiencing. The development of an individual style is intangible. The ways that works of art are composed become an expression of a means to access a thematic transformation of methodology, a personal signature. These three stages in the creative process form a foundation for my exploration of the tactile and existential imagination in creative practice.

What I describe here, drawn from my exploration of imaginative function, is an aspect of an entirely integrated imaginative system in the brain. Since traditional definitions of the imagination directly contradict this conceptual framework by positing that the imagination is not connected to the senses, it is important to note that there is a controversial element to these

---

50 Modell’s work, as referenced here in The Imagination and the Meaningful Brain employs research connected to cognitive psychology, since he is a Freudian psychologist, but I have re-interpreted this reference somewhat to engage in the creative process more specifically, without distorting his intent.
principles. The outcomes which emerge from this study are significant, in that they provide a foundation upon which to build a more thorough study of the tactile aspect of imaginative functioning as well as its relationship to creative practice.

The framework I have employed, has emerged in response to a study of memory. Memory is also a complex system in the brain, and as such many functional aspects of memory have been established. Attention and short term memory deal with the relationship of memory to present time. Working memory, procedural memory, and explicit memory deal with the relationship between memory and conscious engagement with the world. Long term memory, autobiographical memory and implicit memory deal with the relationship with past time, both on a conscious and non-conscious level. In the context of memory as a complex system, imagination also has, I propose, different functional aspects. The tactile imagination deals with embodiment and imaginative function in relation to the senses, movement and non-conscious and conscious perception. Since the body draws on all of the resources the brain provides, together with its own sensual input, the body is highly intelligent. Embodiment is most closely associated with the sense of touch. In my training process, an intelligent, aware body becomes a medium for artistic expression.

Movement provides an example of the functionality of the tactile imagination. Movement occurs within the body’s internal spatial relationship, and occurs in movements of the body in space, in relation to the material world. They both deal constantly with selectivity, as well as with patterns and composition, and therefore engage constantly with imaginative brain function. The tactile imagination – that aspect of the biological imagination closely associated with the sense of touch, is largely non-conscious. Touch imaginatively engages physical contact with the sensations of touch, hot and cold, pleasure and pain, movement, animation, and space – both
practical and imagined. It also deals with the internal relationships of the body through co-
ordination, energy and resistance, stillness and movement.\textsuperscript{51}

Imagination, emotion, and memory are complex multi-functional systems in the brain,
and a movement, or a speech act is a specific cognitive and physical outcome resulting from the
engagement of those functions. In this context, there are no universal outcomes. Outcomes are of
necessity interpreted. Increasing knowledge of creative practice by viewing it through the lens of
brain function may enable a more productive development of the process itself, and at the same
time encourage more research into the nature of the imagination and its uses in creative practice.

Grounding the imagination for creative practice in the senses – specifically the sense of
touch through proprioception and kinaesthetics, is connected to the development of altered states
of perception, as well as the notion of space, pattern logic, and dynamics in movement and
stillness, because there must be an embodied base to anchor the tactile imagination into a notion
of reality.

The developmental study of the nature of human movement is the enhancement of
proprioceptive and kinaesthetic intelligence. This supports an active embodied imaginative
engagement, by developing a process which is not limiting the way movement takes place.
Instead it supports an enhanced appreciation of embodied pattern logic, a dynamic relationship
between stillness and movement, the sensual connection between the body and the material
world, learning the directional use of energy, and connecting the breath in a supportive manner.

\footnotetext{51}{It is important to note that the tactile imagination does not require physical activity to be
engaged during the process, once physical activity has been established developmentally in
childhood. This is the result of ongoing current research into the mirror neuron system.}
Then a new relationship between the self and the world emerges. Focusing on embodied
discovery maximizes the opportunities for imaginative pattern development, in an open-ended
manner, by not specifying a goal. The constant and ongoing mapping of both proprioceptive and
kinesthetic activities includes possibilities and alternatives before and during physical activity,
enabling a close connective and adaptive dialogue between the tactile sense and imaginative
brain activity.

The body is an intelligent individual physical/psychical personality. She or he perceives
primarily in two modes - schematically/intuitively, and linearly/deductively, and most
importantly, there is also a third way combining both schematic and linear processing in altered
state perception. This mode of non-conscious and conscious interface perception is required for
embodied learning in creative practice. Stillness informs the expressive capabilities of movement
within the body. There is always a dynamic relationship taking place between stillness and
movement – even in acrobatics. A physical, or experiential awareness of this is the beginning of
real physical embodiment. This can be achieved no matter what physical state the body is in. The
tactile imagination is in continual contact with all of the body’s systems, and what is happening
with these systems from moment to moment affects the imagination and the act of creating. The
state of calm, or suspense is an embodied state, and imagery developed imaginatively is
embodied imagery.

Thematic, situational, choreographic, atmospheric, emotional, and psychological aspects
of theatrical play are all spatial. The discoveries made by the body while engaged in this play are
also made in the mind as associative patterns, and in the brain as pathway development. The
sense of touch becomes sensitized, intelligent, and inventive as experiences in this type of play
are developed. Tactile neural networks have already been established over time, so this
application of those networks forms an extension of the already developed tactile networking process.

Principles of stillness and movement, where a movement begins and how it engages other parts of the body and in what order; rotation, inclination and displacement, balance, energy, and the body and space have not sought to shape the body to adopt a specific style of movement. Instead the purpose has been to enhance an experience of movement itself. Experiential principles have been embedded in procedural and spatial memory in such a way that they become highly adaptable. The way embedding happens is as important as the act of doing it. In a sense it is both active and reflective at the same time. These principles are useful for the writer, director, choreographer and performer. They do not demand that participants have a certain body type, or move only in certain ways. What has been developed is more subtle and long lasting, because it has engaged the imagination. In a sense the body and the brain are mirrors of each other; three dimensional moving-image synaptic maps become representational, expressive, and metaphorical play.

The active and engaged study of the nature of human movement supports an active imaginative process in the embodied mind. Developing a process which is not limiting the way movement takes place, but instead supports an enhanced appreciation of physical pattern logic and the dynamic relationship between stillness and movement, results in a conscious sensual connection between the body and the material world. By this means, a new relationship between the self and the world emerges. The crucial aspect to this development is its connection to the creative process and the imagination. It is the utilization of a medium, a means to optimize a playful and imaginative engagement in the creative process. Focusing on discovery in a non-competitive environment maximizes the opportunities for imaginative pattern development, in an
open-ended manner, by not specifying a goal. Movement becomes a material medium for image expression, in support of improvisation and presentation. The embodied tactile imagination is essential no matter what medium is explored, be it in the realm of the arts with words, sculpted materials, animation, narratives, the camera, or music, and in science with mathematics, experimentation, and theories, or in the humanities with innovation.

The other dimension of imaginative brain function I have identified is involved with consciousness, and I refer to this aspect of imaginative functioning as the existential imagination. By existential I mean the imagination in relation to our awareness of our existence – our sense of self. The imagination provides possibilities, alternatives, patterns and composition to enable a conscious ability to make choices, solve problems, prioritize, take action, and give expression to our thoughts. Reason is, from a logical standpoint, a linear process, and imagination by its associative nature, employs pattern logic. With reference to the dualism inherent in classical philosophical thought with regards to the imagination and reason, my observations point to the notion that indeed they are equals, and they are symbiotic. In fact, we move between linear and pattern thinking continuously, and readily combine them. The art of poetry provides a compelling example of this type of semantic and image combination.

Creation requires a reversal of this thinking process in which conscious linear cognition supports the imaginative patterned process. The tactile and the existential imagination are not separate functions, and they both operate on a non-conscious and conscious level. This aspect of imagining, as it relates to creative practice, is holographic, or multi-dimensional, related to the notion of space/time and altered perceptual states.

My pedagogical structure – identification, transference and transformation, provides an ongoing context for each aspect of my training process, emerging from an imaginative reversal
in which the imagination dominates and reason enables. The use of procedural and short-term memory as discovery in the process of imagining, and the connection between memory, emotion, and imagination in the expression of imagery at a conscious level, engage the existential and tactile imagination in creative practice. The medium I have employed for training this creative potential is improvisation.

Improvisation is focused on the engagement of imaginative creation directly. In this context, the purpose in engaging the imagination is not to give an individual what he or she wants, but what they need to go beyond their present circumstances. This principle of stimulation is built into the improvisational structure. This is an important distinction in an understanding of the nature of imaginative function in the creative process. It is important to remember that improvisation in this instance, is being employed as a methodology for training, and the trainees are usually encountering this work for the first time. Simultaneously, they are developing tactical skills while they improvise, and these are being established in procedural and working memory. The improvisations offer experiential learning, together with a discovery of elements of the theatrical process as a medium as they relate these discoveries to creating new material. The lesson is embedded in the improvisational experience. Improvisation as a medium has a systemic connection to imaginative brain function in the development of creative practice.

Is this process only applicable to the training of the creators of original material for the theatre, or could it be employed as a blueprint for developing a creating methodology in a wider context? I have already connected the imaginative function of providing possibilities and alternatives with an initial stage of identifying compelling images, by means of enabling an altered perceptual state in which the imagining process dominates by suspending executive
control at the conscious level. How may this be achieved? In my theatrical training process it is achieved by experiencing first-time through the use of a neutral mask.

The mask is, in the context of this training, a sculptural super-script, where super-script refers to a sculptural medium which is capable of being employed in a number of individual scenarios, to take on a significance beyond its practical utility. The creating/devising individual adopts the mask persona as a point of view to engage with creating. Providing neutrality as a suspension of judgement is the function of the mask as a principle. It is not personal. It is a means to experience identification as embodied discovery, and the purpose is to embed in memory the imaginative neuro-plastic pathways implicit in this series of discoveries. It becomes a profound experience of an embodiment of the cognitive reversal enabling reason to support the imagination. The identification experience becomes embedded in procedural memory and is therefore accessible as a skill in transference imaginatively. In this way the mask enables the creator to take ownership of her own imaginative process. Patterns of imagery encountered at one level, for example in embodied improvisation with a mask, can later be transferred into imagined presentational narratives on another level altogether, in transformation. The imaginative process has been transferred into a practical embodied set of skills, and the skills form the raw material to enable the creative process. The mask, as other is experienced as self through embodiment. Can this be accomplished by some other means, given that the mask is pertinent in a theatrical context?

The mask is a means to enable creation for the theatre. It is, in a sense, a living metaphor. Perhaps a living metaphor is a means to enable creation in all of the arts, and in all creative communication. What is a living metaphor? There is an extensive discussion of living metaphor in literary criticism. Ricoeur states in *La Métaphore Vive*: “Live metaphors are semantic events
whose meaning emerges from the individual utterance at hand” (207). This concept employs metaphor in the literary sense, but it is also applicable, in my view, in a cognitive sense. The notion of living metaphor also occurs in *Metaphors We Live By*, by Lakoff and Johnson.

“Metaphor is as much a part of our functioning as our sense of touch, and as precious” (239). Based on my practice, a living metaphor is not personal and it has no psychology attached, and it is employed as a means to enable brain-based experiential learning. It is not only learning a procedural memory task, in a sense it is learning how to learn, through improvisation. One possibility of a living metaphor which might replace the mask is an embodied notion of time. Stephen Hawking, in *A Brief History of Time* states that: “We must accept that time is not completely separate from and independent of space, but is combined with it to form an object called space-time” (22). As metaphor, time has many possible associations, such as first time, last time, and only time as already alluded to with the neutral mask. In addition there is timing and the sense of rhythm, past time, future time, and the notion of present time. This does not become a theme, but instead is employed as a means, a metaphor for theatrical play.

It is extraordinary how each creation is a reflection of its creator. A living metaphor is a means, it is not an end in itself. The user reveals her self through each of her discoveries. Living metaphor uncovers a sense of self imaginatively for the purpose of manifesting itself in the act of creation. This goes on with each living metaphor, as well as in the order in which subsequent related metaphors are introduced, and is embodied and incremental. In the context of creation this is the engagement of the existential imagination.

Transference connects to the imaginative patterning process by linking patterns from one domain onto another to develop associations usable in creative practice. Linking image patterns develops scenarios, narratives, and all kinds of patterns as creation. The purpose in the training
process is the development of the skills needed to link patterns, to create new domains of enquiry. Improvisation provides a means to transfer experience from one set of discoveries into another creative context altogether. Living metaphors work by means of transference.

In the teachings of Jacques Lecoq, weekly presentations demanded that the neuro-plastic connectivities established in improvisation were actively re-engaged in individual and collective creations by providing themes that were employed as provocations to be responded to in a practical dialogue. This work draws on the participants’ discoveries as they are transferred into their own creations in presentation. As a result they develop their own stylistic voices. This re-enforces their discoveries by encouraging the participants to engage with their own metaphorical journey and establish that this is an ongoing public dialogue. The medium of the living metaphor is transformed into a personal style. In this context, transformation involves a metamorphosis of meaning.

Inventing compositions shifts the emphasis onto the development of the creator of original material and imaginative function. Each thematic encounter produces echoes in later work. An imaginative sense of self is being developed through all of these encounters, and manifests itself in trainees’ creative practice, and in the development of their own style of presentation.

There is a trajectory in the creative process, and participants map that trajectory, a reflection of the interior mapping of imaginative brain function. This is an important development in trusting physical perception and non-linear schematic intelligence. Trainees gain a high level of confidence in their imaginative ability, and are very comfortable with a sustained altered perceptual state. They trust their imagination, and are unafraid to follow a series of linked patterns without knowing where they will lead first.
The individual creator/practitioner never 'disappears' in the imagery. In the journey into the imagination in creative practice, one is always present on that journey. Identifications are contained and coalesced into a persona, and the persona belongs to the creator, not the creation. This is the dynamic dialectic of creating. The push and pull cannot exist without two counter points. The process of identification and transference is transformed into a body of work. It is a reflection of the self, through improvisation. It happens once the creator stops searching for an answer.

Conclusions

It is possible, as I have demonstrated, to design improvisational techniques in training that encourage the development of new imaginative neuro-plastic pathways. These techniques revolve around a creative process of identifying, transferring, and transforming embodied metaphor through improvisation. Evidence for this occurring takes place when this metaphorical logic re-emerges in numerous ways in performance imagery, during presentations. These pathways manifest themselves in a wide variety of creative communication on a daily basis. This includes a parallel discovery of a sense of self as creator. Imagination and resistance as a creative combination are an important dynamic in creating new material.

These understandings and observations, described above, form a set of principles about the imagination and creative practice. The imagination as brain function is employed in the creative process to embed creation as a skill in procedural memory. It is then re-used in transformation as it engages with the participants’ own work. The reversal of cognition, allowing perception to support the imagination is essential to permit the creative process to occur, as my observations have demonstrated. It is embodied through a connection to the
theatrical/metaphorical space. The trajectory of the creative process is identification, transference and transformation. Imaginative brain function consists of possibilities, patterns and composition. The primary focus of the entire training process is the development of the tactile and existential imagination for creative practice in the theatre.

The imagination is grounded in the body. Each trainee develops physically, and certainly they develop skills, but the focus of my training is not the actor, it is each individual’s imagination in creative practice. I propose that one of the requirements of the imagination, in the act of creating, is stimulation. When images or ideas become stimulating, they engage both the imagination, deeper feelings and memories. In this way images or ideas become compelling, in that, they stimulate a response – an active engagement. In my experience creating is not a comfortable endeavor. Calmness, as I have referenced earlier, is not the same as comfort. We create imagery out of experience, the experience of the senses in contact with the physical world, and we create art out of imagery. This is the process, in experiential terms of transferral and transformation. Discovery through identification is the ground of our imaginative being and a basis of our adaptability and development.

The imaginative relationship between the creator and what is being created is an interesting exploration. In a sense it is a provocation, a provocation to the process of learning, to advance the process itself. This pedagogy and the results of this training process have stood up to scrutiny and critique from both the theatrical profession and a global audience for over seventy years. An analysis of practice provides a key to the principles behind the pedagogy, but it is only a part of the whole structure. It also deals with experiential learning and the structuring of space for design and architecture. It takes the creator/practitioner from identification to transformation and the development of a personal style. It establishes that there is no barrier between
consciousness and non-consciousness. The notion of a barrier is a social construct with no physical evidence in the brain to support it. The creative process is not initiated consciously, and is not dependent on conscious acceptance.

What Comes Next?

The purpose of this thesis has been a reflective analysis of my practice in the theatre. Drawing upon these reflections I established principles concerning the imagination as cognitive function as a means to develop applications in creative practice. This analysis was based on my training pedagogy, training the creator/performer in the development of original image-based presentations, as well as drawing upon selected cognitive neuroscience research. Therefore, it has not been my intention, as a result of my scientific enquiry, to discard this training process in favour of developing a new pedagogy. However, the opportunity to develop new techniques based on this analysis, and adapting the pedagogical process to engage with new challenges and new circumstances is an important next step.

Gaining greater insight into this pedagogy through the lens of imaginative brain function provides an opportunity to open the training process up to new possibilities. What is the significance of the altered perceptual state necessary to the creative process? What is the importance of improvisation as a connective medium? What does it mean to recognize a mask as super script? Can these discoveries take creative practice further, and do they have applications in other contexts?

Based on my research, the improvisational medium has a close connection to imaginative brain function in the development of creative practice. The three stages of creative development have a correspondence in three aspects of imaginative brain function. This embodied process has
a built in adaptability, and provides a theoretical grounding upon which to build and extend this research.

In this study I address the question: can the imagination be developed, and can the creative imagination be educated? I believe that I have answered that question. In the twenty-first century, the creative process has become the principle asset of our existence. The promise of the imagination is that it permits one to perceive that which is not evident, to know the unknown, and to reveal the invisible. I have posited in my enquiry that training can be a careful and deeply considered development of the tactile and existential imagination for the purpose of creation. The intent of my presentation of this material has been to take improvisational training processes focused specifically on the development of creators of original material for the theatre and open them up to creators and innovators in other fields. My ongoing engagement with the academic and training communities will serve to test these principles. Improvisation as a medium has, in my view, a close connection to imaginative brain function in the development of creative practice. My intention is to stimulate further research and development into the process of training the imagination to engage in creative practice using methods such as practice based research. In that sense this thesis is a beginning.
Works Cited


Lachaux, Jean-Philippe, Axmacher, Nikolai, et al, “High Frequency Neural Activity in Human
Cognition: Past, Present, and Possible Future of Intracranial EEG Research.”


Sheets-Johnstone, M. “Kinesthetic Experience: Understanding Movement Inside and Out”.


Assoc., 2006.

