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# Cognitive imagery training in a dancer's deliberate practice: Skills development, confidence and creativity

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# Abstract

Cognitive imagery training is an effective tool in improving skill learning, technique, confidence, anxiety and arousal management, recovery, rehabilitation, and performance in dancers. Multiple studies (Abbott & Collins 2004; Hall 2009; and Nordin and Cumming 2006, 2011) have established the positive influence imagery can have on dance and sport, and numerous researchers in these fields promote the incorporation of cognitive imagery training into 'deliberate' practice. Cognitive imagery, in relation to dance, is the detailed imaging of the execution/performance of movement in the mind. This thesis will outline imagery use: such as the types of imagery and how it can be measured; the benefits of imagery training – especially in relation to confidence and injury; the relationship between imagery, viewing dance and the modelling technique; and how to effectively incorporate cognitive imagery training into 'deliberate' dance practice. This study, supported by the above literature, revolved around the research question: what is the effect cognitive imagery training and the modelling technique have on skill mastery, and confidence and creativity in improvisation and creation, when incorporated in deliberate practice? I am a pre-professional contemporary dancer and I was the principal subject (and object) of the research enquiry. Conducted over eight weeks, the study utilized publicly available video clips of a movement aesthetic and a specific movement skill as material for the cognitive imagery and modelling technique training program. Additionally, imagery as a recovery and training tool during injury and rehabilitation was investigated due to an unexpected injury that I suffered during data collection. I collected data through journaling, and video recording of the physical practice was undertaken to compare my immediate internal response to the physical session with reflective practice. I conclude that I developed physically and artistically during this time – due to the combination of imagery training and the modelling technique, physical practice, and internal and external comparative reflections on these methods using journaling and video analysis.

# Declaration

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# Table of Contents

# Glossary

**Imagery** The experience that "mimics real experience or *approximates a desirable sensation"*. (Nordin & Cumming, 2006, p. 4; emphasis in original).

**Cognitive imagery training** The deliberate and repetitive use of imagery to assist in performance.

**Deliberate practice** Forms of training that are highly relevant to performance enhancement in a specific area, and are deliberately and consciously partaken in regularly as part of a training program.

**Embodiment** The perceptible encompassing incorporation of a form or aesthetic in the body.

**Kinaesthetic empathy** The response that occurs in the body when watching movement, whereby the viewer experiences the sensations of the movement in their current physical state.

**Modelling technique** Viewing a movement/action being performed resulting in the development of a cognitive representation of the movement/action – allowing for more ease in the reproduction of the movement/action.

**Mental rehearsal** Another label for cognitive imagery – the rehearsal of movement such as a skill, sequence of steps, or performance, in the mind through imagery.

**Sensation response** What is felt in your body in response to a work of art or experience - the feeling/sensation that occurs during kinaesthetic empathy.

**The zone/flow state** A state where the mind and body is completely focused on the task at hand, resulting in optimum performance.

# Introduction

This thesis is a study on the use of cognitive imagery training and the modelling technique as training tools to incorporate into 'deliberate' dance practice. Imagery has been proven by multiple studies to enhance skill learning, technique, confidence, anxiety and arousal management, recovery, rehabilitation, and performance in dancers. Given this multitude of benefits, the aim of this thesis was to investigate and outline the types of imagery and how they can be measured; the benefits of imagery training – especially in relation to confidence and injury; the relationship between imagery, viewing dance and the modelling technique; and how to effectively incorporate cognitive imagery training into 'deliberate' dance practice. Supported by this contextual research, the study asked: how can the application of a cognitive imagery and modelling technique training program into a dancer's deliberate practice enhance skill acquisition and refinement, the embodiment of movement aesthetics, and creativity and confidence in improvisation and dance composition?

The study was formed as a case study conducted on myself over a period of seven weeks; involving cognitive imagery training of a movement aesthetic and a movement skill three times a week, followed by physical practice of the skill and improvisation/creation in the movement aesthetic. Qualitative data was collected through journaling, and video recording of the physical practice was undertaken to compare the immediate internal response to the physical session with reflective practice. Imagery as a tool during injury and rehabilitation was additionally investigated due to an unexpected injury during data collection.

For several decades, there has been a growing interest in the psychology of dance and various cognitive training methods, (Driskell, Copper, & Moran, 1994; Nordin & Cumming, 2006; Taylor & Taylor, 1995) however dance artists and companies are only just beginning to incorporate cognitive skills training into their schedules (Nordin & Cumming, 2005, 2006, 2007). There is significant sports research (Nordin, Cumming, Vincent, & McGrory, 2006) and some dance specific research (Nordin & Cumming 2006; Nordin, Cumming, Vincent, & McGrory, 2006) around the benefits of incorporating alternative training forms into deliberate practice – especially psychological related methods such as cognitive imagery training. Deliberate practice consists of forms of training that are highly relevant to performance enhancement in a specific area, and are deliberately and consciously partaken in regularly as part of a training program.

However, cognitive training methods are habitually seen as supplementary forms to a dancer's physical practice – something the dancer can undertake outside of their regular schedule. This is despite the literature supporting the incorporation of these methods into 'deliberate' practice to balance physical training – assisting in recovery whilst still engaging in practice.

Extant literature covers many aspects of the benefits of cognitive imagery training, however I have found little research around how imagery training can assist a dancer in the embodiment of a movement aesthetic to assist in creativity and the quality of movement improvisation. In addition, I have also found a lack of targeted information into the partnering of cognitive imagery training with the modelling technique to assist in the activation of kinaesthetic sensations and cognitive pathways that occurs when viewing movement. These avenues have been researched in this study, and the resulting positive outcomes support the use of cognitive imagery training and the modelling technique in a dancer's deliberate practice for technical and artistic development. Benefits of enhanced creativity, skill acquisition and refinement, and the embodiment of movement aesthetics during improvisation and dance composition were realised.

Supplementary outcomes were seen in the benefits of video reflection – of both personal physical practice and professional works – such as a more secure sense of self, confidence, creative reflection through choreographic analysis, and technical and artistic correction. Additionally, the study evolved to test the benefits of cognitive imagery training and the modelling technique as recovery and rehabilitation tools during injury due to an unexpected hamstring strain during data collection. Here, the findings were extremely positive, determining that the use of these tools during injury recovery and rehabilitation resulted in a healthy recovery period and a smooth transition back into physical training – due to the ability to continue training through cognitive imagery techniques and the accompanying sense of purpose this provides. Overall, the findings of this study support the incorporation of cognitive imagery training and the modelling technique into deliberate dance practice.

## Literature review

Imagery is the development of a perception or experience in the mind; described by Sanna Nordin and Jennifer Cumming (2006, p. 88) "as an experience that mimics a real experience or approximates a desirable sensation". Dance imagery has been categorized in numerous ways, one of the most popular is seen in the Dance Imagery Questionnaire (DIQ) designed by Sanna Nordin and Jennifer Cumming. The DIQ was created based off the Sports Imagery Questionnaire (SIQ) with the purpose of developing a valid and reliable tool that could provide information around the extent with which dancers image (Nordin & Cumming, 2006). The DIQ has four categories of imagery types used in dance: technique (jumps, turns), goals, role and movement quality, and mastery (preparing for variables that could affect performance) (Nordin & Cumming, 2006). However, I believe an essential category is over-looked in the DIQ based on other information I have gathered (Etnier, 2009; Monsma & Overby, 2004; Orlick, 2008; Taylor & Taylor, 1995) and that a more comprehensive categorization can be created by combining Jim and Ceci Taylor's classification in their 1995 book *Psychology of Dance* and the DIQ to create four categories: technical, psychological (confidence, goals, mastery), physiological (intensity e.g. recovery, arousal), and role and movement quality. From these, the broad spectrum in which imagery can aid a dancer's training can be more thoroughly understood.

The most well-known and frequently used form of imagery is technical imagery (Nordin & Cumming, 2006). Technical imagery is the formation of an image of yourself or another dancer performing a step/movement or a sequence of steps/movements in your mind. It can be utilised at many different points during a dancer's program – before, during and after, movements, class/rehearsal, or performance. By using imagery, the dancer can strengthen the movement patterns, helping with skill acquisition and refinement, and detail retention (Craig R. Hall et al., 2009; Nordin & Cumming, 2008; Taylor & Taylor, 1995). A useful example is described by Jim Taylor & Ceci Taylor (1995) whereby if a movement is performed correctly, the dancer should repeat the movement as a cognitive image to help retain the correct sensations of the movement, and if performed poorly, form a cognitive image of the desired movement execution ensuring the corrections are applied to "cleanse" the body of the memory of the poor performance. Even incorporated into just one aspect of a dancer's schedule, technical imagery has proven to lead to improved overall performance due to the

skill acquisition, movement refinement, and retention of corrections and sensations that technical imagery reinforces.

Psychological imagery can be deconstructed into several areas – goals, mastery (preparing for variables that could affect performance), and subsequently, confidence, and stress/anxiety. Goal imagery is imaging yourself achieving your goals, for example: 'I image myself getting a contract with my favourite company' or 'I image myself being selected to tour internationally' (Nordin-Bates et al., 2011). Mastery imagery helps prepare yourself for any undesired/unknown circumstances, for example: 'I image myself recovering from a slip onstage with confidence', or 'I image myself performing well in an interview/audition', or 'I image myself performing with ease on stage without detrimental anxiety' (Nordin-Bates et al., 2011).

As subsections under mastery imagery, there are imagery techniques that specifically assist with confidence and stress/anxiety. As indicated in previous research, dancers are prone to low self-confidence (Buckroyd, 2000; Laws & Apps, 2005) and working in highly physically and mentally stressful environments, such as rehearsals and performances, results in dancers experiencing stress/anxiety often (Taylor & Taylor, 1995). Numerous studies have shown that mastery imagery is positively linked to higher self-confidence in both elite sports and dance (Fish, Hall, & Cumming, 2006; Monsma & Overby, 2004; Nordin & Cumming, 2006). Sanna Nordin & Jennifer Cumming in their 2006 paper on the creation of the DIQ, explicitly emphasize their belief that due to the range of findings associating dance imagery – specifically mastery imagery – with self-confidence; cognitive imagery training deserves to play a significant role in a dancer's deliberate practice. Interestingly, another paper by Nordin found no relationship between imagery types and self-esteem, but rather noted that imagery could be helpful in enhancing competence and confidence around specific tasks however "may not as readily influence the more fundamental construct of self-esteem" (Nordin-Bates et al., 2011, p. 79). I believe this is important to note, and that when in this paper I refer to confidence, I am referring to a dancer's self-confidence in their ability to perform – whether it's confidence to perform a step correctly or confidence in their ability to develop material – and not a dancers' confidence in themselves as a person, despite the difficulty anyone might have in separating the two.

In addition, Sanna Nordin-Bates et al study (2011) reported that throughout the research period, the participants recorded relatively high levels of self-confidence which contrasts to

what has previously been determined, and may mean that for an improvement to be imminent, the subjects need to initially experience lower confidence levels. Moreover, Nordin-Bates' research did not measure whether the imagery training was supplementing the dancers' confidence levels, thus when circumstances prompted a potential dip in confidence the imagery techniques possibly were helping to maintain confidence levels. However, without further research and perhaps using a methodology that embodies the unique narratives and commentaries of the subjects, this variable remains unknown. In conclusion, the literature shows that psychological imagery can significantly assist dancers to manage anxiety, stimulate motivation, maintain or increase confidence, and mentally prepare them for foreign situations and environments.

Physiological imagery is imagery used to control arousal levels, allowing for optimum performance and recovery. Past literature has confirmed the effectiveness of imagery on controlling the body's arousal levels for optimum performance, and it is used often by both sports and dance professionals (Etnier, 2009; Orlick, 2008; Taylor & Taylor, 1995). Likewise, there is supporting literature around the use of imagery as a recovery and injury rehabilitation tool; however, conversely, a study by Nordin and Cumming showed that dancers of all levels imaged only sometimes in 'down' situations such as after class/rehearsal, during holidays, and in locations unrelated to dance (Nordin & Cumming, 2008). It seems to me, and a multitude of other researchers, that imagery is an invaluable tool to use during time off – such as when injured or unable to rehearse – as it is free from injury risk, physical fatigue, and requires no monetary expense (Nordin & Cumming, 2007; Taylor & Taylor, 1995).

## Imagery in 'deliberate' dance practice

Seeing the above literature surrounding the benefits of imagery in relation to dance, I question why cognitive imagery training has not been established as a form of 'deliberate' practice and incorporated into dancers' training and professional schedules. 'Deliberate' practice is "highly structured and purposeful forms of practice", which are "highly relevant to performance enhancement in a specific area" (Nordin, Cumming, Vincent, & McGrory, 2006, p. 345). For many years 'deliberate' practice in sports and arts only consisted of physical training and skills development in the immediate area of relevance, however due to the progression in sports psychology and neuroscience, more cognitive based activities are now considered 'deliberate' practice; such as studying music theory and analysing chess games for violinists, and video practice for decision-making skills in team ball sports (Nordin et al., 2006). It has been

established that higher-level athletes use more psychological skills than lower-level athletes, and that psychological skills can predict performance better than physical outcomes (Abbott & Collins, 2004). Many elite athletes believe they would have reached excellence faster if they had begun cognitive skill training earlier in their career (Abbott & Collins, 2004; Orlick, 2008).

Numerous papers discuss how the activation of neural pathways and movement patterns/sensations during imagery are so similar to those activated during physical performance, that cognitive imagery is functionally equivalent to physical practice (Holmes & Collins, 2001; Driskell, Copper, & Moran, 1994) and should be incorporated as 'deliberate' practice for improved performance (Etnier, 2009; C. R. Hall, 2001; Nordin & Cumming, 2007; Nordin et al., 2006). To have the most effective 'deliberate' practice, cognitive imagery training and physical practice should be combined equally (Etnier, 2009; Nordin et al., 2006). Due to dance being highly physically demanding, it is difficult to cross-train on top of a normal schedule without the risk of burnout or injury; hence the incorporation of psychological forms of training, such as imagery training, means that the dancers can recover physically and yet still train in situations where there is limitations on physical training – such as when travelling, resting, or during injury or illness (Nordin et al., 2006).

## Imagery, creativity and improvisation

A recent study centered on the influence imagery could have on compositional creativity in musicians (Wong & Lim, 2017). It determined that imagery was effective in stimulating inspiration during the creation process when the musicians are generating and exploring ideas and possibilities. It is mentioned that by mentally representing a problem one can overcome cognitive obstacles such as functional fixedness – whereby you only see things in a particular way – allowing for divergent thinking and creative solutions (Wong & Lim, 2017). This technique shows vast potential as a method to be used in the dance making creative process, and I believe more research into this concept would be highly beneficial to dance scholarship and dance artists.

With a similar result, improvisation uses the subconscious mind without intellectual censorship: as Blom and Chaplin in the novel *The Intimate Art of Choreography* describe, "[improvisation allows] spontaneous and simultaneous exploring, creating, and performing" (1982, p. 6). Therefore, these two techniques of imagery and improvisation, would be especially useful for dancers who struggle with choreography and creative thinking, and feel

trapped or stifled by tasks outlined by the choreographer. By incorporating these methods into deliberate practice, they could provide greater understanding for the dancer on how they can access these states of divergent thinking, and spontaneous exploring and creation, when needed. I hope that my research will be the beginnings of this investigative pathway by using cognitive imagery training, the modelling technique, and improvisation, to facilitate the embodiment of movement aesthetics and stimulate creative possibility pathways.

Creating movement requires the exposure of one's self and being, as it is the subjective response of one's experience – both personal and worldly – through sensation, desire and movement. Many dancers, including myself, experience a vulnerability when sharing their own movement, resulting in low levels of confidence in choreographic situations. Carol Press in her novel 'The Dancing Self', describes the anxiety dance students experience when asked to create and how this vulnerability exposes one's self to fragmentation: where feelings of being un-whole and a drop-in self-esteem is experienced (Press, 2002). Now of course, not every dancer experiences this vulnerability negatively, but those who do are distracted by their focus being drawn to what others perceive of them – resulting in an inability to access a state of flow, otherwise known as entering 'the zone' (Alston, Kain, & Jowitt, 1991). Worrying about yourself and what you look like causes negative feelings and a general depression of mood, and the anxiety of exposing this insecurity to others can compound an already fragile self-image – resulting in the saturation of large portion of your conscious thinking processes (Alston, Kain, & Jowitt, 1991). Whereas if a state of flow is accessed, there is less cognitive 'room' to think about your self-image or how you will be perceived, as every part of your being is tuned into the task at hand – allowing for creativity to take the reins (Alston, Kain, & Jowitt, 1991). Therefore, cognitive imagery training – being a tool often used by performers and athletes to get into the zone for performance – can likewise be used to slip into the creative zone in practice, and support the artist's confidence in their own movement and a stronger sense of self. In summary, the literature clearly supports the incorporation of cognitive imagery training and other forms of psychological training into 'deliberate' practice for performance enhancement, and athletic and artistic development.

## How dancers image

To incorporate cognitive imagery training into 'deliberate' dance practice, we need to be aware of how dancers image and what skills they need to develop to train effectively. It is important to note that unconscious debilitative imagery does occur on occasion – if not

7

regularly for some people – and identical to deliberate facilitative imagery, debilitative imagery will similarly strengthen neural pathways and movement patterns but with an undesired effect (Nordin-Bates et al., 2011). Images need to be high in complexity; layering visual, kinaesthetic, auditory, thought, and emotional details, for a realistic reproduction of the movement/goal/environment (Taylor & Taylor, 1995). Perspective likewise needs to be specified, and the general consensus from researchers is that imagery is ideally executed in an external perspective for new movements – where the dancer has no previous kinaesthetic information – to ensure their bodies are placed correctly. Only transitioning to an internal perspective when the basic skills have been learnt – to strengthen the internal sensations of the movement (Taylor & Taylor, 1995). The speed of the imagery also needs to be determined – preferably slower to begin with so that details are carefully executed, and gradually transitioning to real speed to practice receiving and executing detail at tempo (Taylor & Taylor, 1995). Each time a dancer intends to image, a goal/purpose should be established – identifying what exactly they wish to focus on and how it will be accomplished in that session (Taylor & Taylor, 1995). Generally, a goal should be set and focused on for several sessions to create a connection to the image, and ensure the kinaesthetic and neural pathways are strong. Furthermore, it is easier to develop an effective image when the 'unknowns' are controlled to one or two: for example imaging a new step in a familiar environment on your own; progressing to imaging the step in a class environment; and then imaging on stage or in a foreign environment (Taylor & Taylor, 1995). These variables should be controlled for maximum results, and to avoid burnout through information overload.

Dancers reported the ways in which they obtained images in the 2005 study by Nordin and Cumming: retrieving memories, watching other dancers, listening to music, or from external stimuli (e.g. books or pictures, depicting an image). These triggers helped the dancers image with a sensation or quality in mind, and although most of the triggers were unintentional, triggers can be consciously used in cognitive imagery training to assist the imagery process (Nordin & Cumming, 2005). In my research, I have used video as an aid in stimulating the kinaesthetic and neural response, which in turn assist the creation of the desired image and artistic outcomes.

## Video training, viewing dance and the modelling technique

Video training is a sub-method of modelling training, whereby an image/sensation – consisting of a sequence of cognitive, emotive and kinaesthetic responses – is formed and encoded in the

memory in response to viewing another person performing the task (Doussoulin & Rehbein, 2011). Having a detailed cognitive representation stored in the memory allows for effective execution of the task/movement; a process almost identical to the procedure of cognitive imagery training as they both follow a method of developing a cognitive representation, rehearsal, and skill execution (Doussoulin & Rehbein, 2011). Viewing movement activates a response called kinaesthetic empathy – a term fashioned in the 1920's and 30's by dance critic John Martin as a response to modern dance – whereby spectators vicariously experience movement in their present muscular experience (Brandstetter, 2013; Doussoulin & Rehbein, 2011, p. 216). Kinaesthetic empathy can be linked to more recent research around the modelling technique and neuroscience's discovery of mirror neurons, which are activated both when performing a movement and observing a movement being performed (Brandstetter, 2013). These concepts I believe are pivotal discoveries, showing great potential as an avenue of research for incorporating these kinaesthetic and cognitive experiences into 'deliberate' dance practice.

My study steps down this avenue, incorporating the modelling technique and cognitive imagery training, and utilising the activation of kinaesthetic empathy and mirror neurons, to construct a form of 'deliberate' practice. This, I had determined prior to my study – based on extant literature – would effectively strengthen skill acquisition and refinement, and enhance creativity and diversity of movement aesthetics. A 2005 study by B. Calvo-Merino, D. E. Glaser, J. Grèzes, R. E. Passingham, & P. Haggard, discovered that greater activity occurs in the brain when viewing a familiar movement/movement style as compared to a movement/movement style that is unfamiliar; both in visual knowledge and motor experience. Results showed that the most activity in the brain occurred when viewing a movement that the dancers had both watched and performed frequently, whereas a decrease in activity occurred when they were watching a movement that they had frequently viewed but never performed (e.g. gender specific movements), and a further decrease occurred when the movement was entirely unfamiliar (Calvo-Merino et al., 2005). This research supports my belief that a connection between cognitive imagery training and the modelling technique would be of great value to performer training. Since by viewing a movement that is unfamiliar, mirror neurons and kinaesthetic empathy are activated, allowing for more ease and familiarity when the movement is imaged – which in turn will strengthen the cognitive pathways and kinaesthetic sensations associated with the movement.

I estimated that the mental blueprint and kinaesthetic empathy created from viewing a movement would provide supporting information for the development of a sounder image in cognitive imagery training, and therefore result in a stronger performance. Both these techniques – modelling and imagery – proved to be more effective than physical practice alone in a study on motor skills development by A. Doussoulin and L. Rehbein in 2011, proving again the impact that these cognitive methods can have on the learning and performance of skills. Within my own study, I likewise experienced the benefits of using the modelling technique and cognitive imagery training to aid in the acquisition and refinement of skills; due to the detailed formation and rehearsal of the skill in imagery, being constructed and entwined with the kinaesthetic sensations experienced from viewing the movement.

## Methodology

I undertook a training program implemented over a period of seven weeks between the 21$^{st}$ of July and the 16$^{th}$ of September 2017, gathering qualitative data through journaling. The cognitive imagery and modelling training occurred three times a week for twenty minute sessions, and a minimum of thirty minutes of related physical practice was conducted for each session. The cognitive training was split into two ten minute sessions: ten minutes on a single movement/skill and ten minutes on a movement aesthetic. The material for the cognitive training was sourced from publicly available video clips, and involved watching a video clip of a movement or a minimum thirty-second-long clip of a movement aesthetic, followed by imaging the movement or imaging improvising in the movement aesthetic.

The cognitive imagery training initially used the modelling technique to assist in imagery composition; eventually progressing to an imagery process without viewing the video prior, depending on the cognitive and kinaesthetic memory of that particular aesthetic or skill. When training with a new movement/aesthetic, imaging was performed in external imagery to ensure the details and structure of the movement/aesthetic was attained; transitioning to imaging from an internal perspective – where the dancer experiences themselves performing the movement/aesthetic with all senses – once confident with external imaging. Physical practice was likewise split into minimum ten minutes on a single skill and twenty minutes of improvisation/creation. Progression to a new skill/aesthetic was made when I felt I had attained the movement to a reasonable level of performance. The skills selected were skills which I have had trouble picking up immediately in the past – skills that provoked fear or

required a form which is unfamiliar to my physicality. The movement aesthetics, however, were usually forms that were familiar and accessible in my body but encouraged diversity and complexity of movement shape, tone, and dynamic – qualities I wished to develop more in my choreographic creation and improvisation.

## Data collection

Data collection for this project involved recording the details of the imagery and modelling training in a journal; detailing the focus of the session along with the date, site, image environment, quality, thoughts and feelings, notes of improvement, and ideas for future sessions. The journaling additionally involved recording any relevant thoughts or experiences around the training and its influence on my performance in my regular schedule. Furthermore, I recorded circumstances outside of the training program where I used imagery to detect the variety and usefulness of imagery training.

The physical aspect of the research was filmed for later reflection and analysis to provide a comparison between immediate reflection, and a more removed and distant reflection of the physical practice. This provided context around emotive states affecting my reflections, and allowed for a comparison between internal reflection and external viewing.

## Cognitive imagery training in a dancer's deliberate practice

This research investigated imagery in dance, incorporating cognitive imagery training into 'deliberate' dance practice, and how imagery training and the modelling technique can assist dancers in skill development, skill refinement, and creativity and confidence in movement improvisation and creation. From the supporting literature and my own experience with imagery training, I had anticipated that this research would determine that incorporating these cognitive training techniques into my training through a concentrated and focused 'deliberate' dance practice involving imaging; would enhance skill acquisition, development and refinement; creativity; and confidence in creation and improvisation. The findings of the study reproduced these anticipated results and more. My refection on this study, surmised that cognitive imagery training and the modelling technique are effective tools to assist in learning and refining skills, embodying movement aesthetics for improvisation, and activating the

creative zone in dance artists. I present these reflections as anticipated and unanticipated outcomes.

## Anticipated outcomes

One of the most notable outcomes of the cognitive imagery training program was seen in enhanced skill development – as participating in cognitive imagery required an active examination into the detail of the skill to understand its form in its entirety for execution. Mental rehearsal of the skill connected the movement with a sensation/image experienced in effective execution, which with continued rehearsal imprinted itself to the skill resulting in improved performance in physical practice. Utilising the modelling technique helped initiate the development of the imprinted sensation/image associated with the performance of the skill, due to the neuron activation, and cognitive and kinaesthetic information transferred when viewing the skill. A noteworthy discovery was the understanding that when the movement was viewed, it was experienced as a *feeling*; my body automatically responded with kinaesthetic empathy, and this kinaesthetic information was strengthened when followed with mental rehearsal – resulting in smoother physical performance. Focusing on this information in the form of an image or sensation when physically performing the movement, lessened, and in some cases completely disconnected the fear surrounding the movement that was ordinarily experienced. It also prevented the over analysis of the skill that can occur when the skill is inconsistent or not reaching completion. Instead allowing the body to rely on its intrinsic knowledge and the image/sensations of the skill, helping to enhance the natural rhythm, momentum and/or flow in the execution of the movement. Over the period of the study I acquired and refined multiple skills, and overcame several fear blocks – some created due to previous and current injuries – to the point where I could confidently perform most of these skills in improvisation where there is little time for mental preparation before execution.

The cognitive imagery training of the movement aesthetic was more complicated than the skill imagery training due to the difficulty for the brain to image new movement at speed, and still produce clear and detailed images. What I often experienced is that I would begin to image from an external perspective and the detail, creativity, and cognitive clarity would blur into a daydream like experience. When I then followed up with a physical practice session, the movement was unclear with frequent repetition of habits and lapses into what can be described as 'faffing around' – movement with little direction, precision, dynamic, technique or quality. To remedy this issue, I attempted to watch the video and take note of *how* the

dancers had embodied the movement aesthetic – finding an image which would help to transfer this aesthetic into my own body – followed by mentally rehearsing improvisation with this image in mind. This resulted in an easier transference of the aesthetic to physicality in the studio; and along with the transference of the aesthetic, came more dynamic, intention and quality within the movement.

Another technique tested, was to image as though I was creating choreography by being highly particular and detailed with the movements and the quality/aesthetic I was working with. This technique likewise resulted in a more effective practice, as the movement was more precise and resulted in less repetition of habits and 'faffing around'. This illustrates that thought and analysis are vital to use alongside the techniques of cognitive imagery training and the modelling technique for the embodiment of movement aesthetics, to result in quality movement improvisation and creation.

These techniques facilitated the accessibility of my own subjective experience whilst still tapping into the aesthetic I had aimed to express, as they required thought into my own responses rather than imitation of what I had viewed. This quote by Loie Fuller aligns with my understanding of my creative practice post study due to the emphasis on the connection between dance and sensation response: "What is Dance? It is motion. What is motion? The expression of sensation. What is sensation? The reaction in the human body produced by an impression or an idea perceived in the mind" (Brown, 1998, p. 17).

When using the techniques of 'choreographing improvisation' and 'reflection and analysis' (as described earlier) in imagery training, the aligning variable is the noticing of the *sensation* in my response to the aesthetic, and the use of this sensation in the imagery training and physical practice as the *stimuli* of the practices. This study has personally clarified the significance of this creative approach in my own practice, as I have experienced how using sensation response can remove the creative blocks I typically experience in task work and choreography, but rarely feel in improvisation. This, I believe, is because improvisation is inherently a sensation response – and generally causes a state of flow with no opportunity for cognitive attention to extend to external anxieties as described earlier in this paper.

## Unanticipated outcomes

The most prominent unanticipated outcome from this study was the usefulness of video reflection for comparison of internal and external reflection responses. Being able to view the physical sessions through the video recordings was an extremely useful tool to experience myself and my dancing as others see me – as the fluctuations of your internal sense of self and the unreliability of the mirror can cause havoc on personal confidence and self-image. As described earlier in this thesis, dancing involves a significant state of vulnerability especially when improvising or creating, as it is an exploration of your own subjective relationships and responses. However, when an artist becomes externally aware of their self, and focused on how they and their work will be received, it often causes a block in creativity due to the inability of the subject to focus into the flow state. Thus, it remains vital for the artist to open themselves to the vulnerability and exposure of creating but remain internally focused on the creative stimuli and the tools available (in the case of dance – the body and space) without consideration of the external experience. This is where video becomes an invaluable tool as it allows the artist to remain in the zone whilst creating, and provides the opportunity to step out and view the work externally in an emotionally removed state to revise and analyse.

Additionally, being constantly aware of how you are being perceived by others causes negative feelings and affects confidence – as Mihaly Csikzentmibalyi describes:

> We're always monitoring how we come across… This is a big burden on our psychic resources. We are always diverting part of our attention to protect ourselves from others. So people's moods plummet when they are made aware of themselves. (Alston, Kain, & Jowitt, 1991, p. 8)

He goes on to articulate how there is no capacity to process your self-image in a flow state because the entirety of the body and mind are absorbed in the task at hand. Another benefit of working in the zone is that a boost in self-esteem is common after an episode of flow due to the achievements and discoveries made during the time in the flow state (Alston, Kain, & Jowitt, 1991). Encouraging situations where the flow state is easier to access is important in heightening positive self-image and confidence for improved performance and well-being. This study has found that these outcomes can be encouraged by filming studio work to avoid working with an external reception focus; and mental rehearsal of the focus, action, and qualities required, prior to partaking in a practice/performance session.

Furthermore, video reflection provided me with a more comprehensive understanding of my strengths and weaknesses, and offered visual information to support the physical information experienced in the training sessions – aiding in the analysis of why things worked and what did not work. Another unanticipated benefit was seeing my physical presentation and what clothes and hairstyles enhance or detract from my external impression. This knowledge is very beneficial in the preparation for important environments such as auditions, as I have an awareness of what gives the most positive impression and shows off my technique, line, and movement to the best advantage.

Watching such a large variety of performers, and choreographies – including myself and my own – has given me a far greater understanding of what I see as creative and quality movement, and what causes this quality movement in my own practice. In her novel *The Dancing Self*, Carol Press describes the importance of evaluation through qualitative thinking, perceiving, and forming (Press, 2002). She states:

> Even before the dance is finished, these processes are mandatory for the important choreographic revisions that are imperative for the experiences of transformative aesthetic resonance and transmuting externalization. Through such critical evaluation, the choreographer finds new dynamic information and clarification to bring to her/his artistic endeavors. (2002, p. 170)

This artistic nourishment supports a greater sense of self-reflection, self-awareness and knowledge around the "subjective realities of others" (Press, 2002, p. 170). This research journey has provided me with the opportunities to divulge in these processes, and I can testify to experiencing these developments in knowledge about the self and the art form.

Reflecting on my practice during this study required me to develop a deeper understanding of what I defined as 'creative' and how this aligned with other artists understanding of the term. I began to analyse and consider the choreographies surrounding me whilst undertaking my research – looking at the videos I was studying for the imagery training, my own improvisation, and the choreography being developed around me in rehearsal. After much research, I surmised that the creative pursuit of art is deeper than perfection and oft times imperfection is what makes the work most beautiful – it is the rawness and richness of the human condition and experience, and the subjectively evoked response of a movement quality that creates this beauty. When I was younger I would watch dance performances and wonder why I became distracted in some works and not others. I would find my eyes glazing and my mind wandering, and only now I know that those performances were the ones that I did not connect with on a

deeper level – there was no intrinsic connection with an atmosphere or quality, emotions, or the senses through a kinaesthetic response. The performance can be clean and executed with great technique but without that underlying connection there is nothing to hold the audience's attention. So, here we see how reflection and analysis can stimulate the accumulation of ideas and qualities that create your personal definition of creativity and greater understanding of the art form. Personally, this study has given me greater awareness of the significance of how the subjective experience conveyed through a medium in its imperfection, rawness, richness and/or simplicity to create an experience that is felt rather than just watched is vital in its reception.

My reflections during this study on why I struggled to work creatively as a dancer prompted further research into the connections between dance training, and activating and nurturing creativity in dancers. Dancer, teacher and director, Sorella Englund said, "Young dancers should not try to mirror someone else or strive for Barbie-doll perfection. They need to be encouraged to become the people they can become" (Cited in Jowitt, 2001, p. 122). Dance training habitually focuses on training the body as a technical instrument, and the traditional technique class is taken to develop skill execution and refine the body's placement for improved shape and line. This objectifies the body, and results in students striving towards a particular image of the dancer's body and technique, learning mainly through imitation. There is often little to no recognition of a subjective and sensory connection to one's body and many dancers experience highly critical perceptions of their bodies and accomplishments, constantly comparing their body to others and the 'ideal' dancer (Press, 2002). Carol Press articulates:

> Moving away from one's body as an object, towards the ownership of one's body as a container of subjective experiences, enables the evolution for the dancer to utilize her/his instrument, not just to execute technical craft, but as a vital element of a relation to the practices of process. Herein lies the groundwork for the nourishing selfobject [sic] function of motion and the core foundation for authentically expressive choreography that speaks meaningfully of one's sense of self in interaction with the world. (2002, p. 177-178)

Press' way of considering the dancer's body encourages self-confidence and artistic expression in movement; allowing for greater discovery of quality, atmosphere, dynamic, and emotional expression. This distinction between movement instigated from imitation, and movement instigated from considered and refined stimuli to connect kinaesthetically into an atmosphere of movement and one's self; clarifies what I classify as creative, and quality movement, and promotes confidence and a more positive sense of self.

16

Consequently, this research process has resulted in my becoming more accepting of the evolving nature of my way of moving, artistic development, and creation processes, rather than striving to relentlessly achieve perfection. This quote from the 1999 conference *Not just any body: advancing health, well-being and excellence in dance and dancers*, sums up this research journey and my perspective on my practice impeccably: "Experiment does not always have to be successful in order to allow excellence and integrity to emerge" (Jowitt, 2001, p. 31). I believe that this perspective is vital in the maintenance of a positive sense of self and confidence in your skills, and the nurturing of opportunities for personal and informative development.

This notion of success fits in well with my discoveries throughout this study; I first set out in my proposed method that I would use imagery and the modelling technique – which is based on mirroring and copying – to help attain certain skills and dance aesthetics. However, as the study progressed the findings demonstrated that when mental rehearsing from videos of other dancers, the focus shouldn't be on imitating their movement, but consciously thinking of how that aesthetic can be achieved within my own body. Using this knowledge as the fuel for the imagery rehearsal – supplemented by the cognitive and kinaesthetic information gathered from viewing the movement – creates an internal focus which helps the artist to remain in the zone and generates the optimum environment for the dancer to work with their own unique subjective experience. As Marion Woodman describes:

> Its [the body's] clarity depends upon its connection with spiritual depth and its connection to its own physical uniqueness. The dancer's art is to connect with their own body and thus kinesthetically with the audience - to connect us to our own inner stillness. (Alston, Kain, & Jowitt, 2001, p. 39)

Utilizing this focus on *how* qualities can be replicated in my body, rather than just attempting to be the same as the other dancers, resulted in a more effective execution. This outcome stems from allowing the dancers focus to be in the zone – where there is an internal understanding and attentive awareness on the images and kinaesthetic sensations, allowing the mind to be absorbed in the moment at hand; in the *now*. The findings of this study demonstrate that when working with imagery training and the modelling technique to embody a movement aesthetic, the main benefit is the ability of these tools to focus the mind into the zone, and prepare the mind and body for working and moving in a particular way, rather than the rehearsal itself.

Throughout the study, imagery was used in a multitude of situations in addition to the training program to test the extent of cognitive imagery training usefulness as a part of deliberate practice. The most significant use of imagery training noted was the occurrence of a significant debilitative injury part way through the study, where a bad hamstring strain prevented my participation in physical activity for a week and then only partial participation for the following three weeks. During this time, imagery was an invaluable tool in maintaining a sense of being actively involved in my training and the happenings within the studio, and continuing to work on my technique whilst sitting out. I experienced how using imagery to image class exercises keeps the brain active in learning and memorizing combinations, and continues to develop and strengthen cognitive pathways and kinaesthetic sensations of movements. Moreover, cognitive imagery training gives the dancer the opportunity to focus on correcting and solidifying certain sensations and information connected to specific skills; for example, the image/sensation of energy from the working legs toe shooting up the supporting leg to lift just under the sit bone during a pirouette, can be mentally rehearsed until the image is strongly associated with a pirouette. Additionally, there was time for reflection and analysis on what other dancers are doing and how that can be achieved in my own body – by using the modelling technique to gain information on the execution of the skill, and applying these sensations/information to my imagery practice.

Being diligent in my imagery training whilst I was injured resulted in a smooth transition back into physical practice as my mind had continued training and functioning in the mind-set of being consciously working in the studio. Furthermore, I physically experienced a reduction in the typical drop in skills post-injury, as my body remembered the information and kinaesthetic sensations required of moving due to the imagery training. I have noticed – by watching other dancers during injured periods and what I have personally experienced myself – 'watching' class/rehearsal when you are injured can be as unfocused as if you were watching TV. Yet, when a purpose and focus is established through the cognitive imagery training program, watching class/rehearsal becomes an opportunity to analyse what you see – such as how it is performed or how it was created – providing valuable information to apply to your imagery training. This 'conscious' watching enhances learning and a sense of purpose and belonging in the studio, resulting in a more positive outlook on the dancer's situation.

During this period of injury, I also used imagery as a rehabilitation tool, imagining my injured leg performing exercises at its pre-injury level. This resulted in what I believe were advances in mobility and strength due to the brain being lead into thinking that the leg was not injured,

and subsequently not restricting the hindered motion to the previous degree. Due to my positive experiences of using cognitive imagery training and the modelling technique in injury rehabilitation, I believe that it is in dance professional's best interest to encourage and teach the involvement of these practices in injury rehabilitation, and for further research to be undertaken to quantifiably test the effect that imagery can have in recovery.

## Conclusion

The process of this study resulted in a transformative period for my artistic mind and I have come out of it more aware of my body, creative composition, and dance as an art form. I experienced the benefits of using the modelling technique and cognitive imagery training as tools to slip into the creative zone, enhance skill acquisition and refinement, and strengthen cognitive and kinaesthetic pathways for improved embodiment of skills and movement aesthetics. Incorporating cognitive imagery training and the modelling technique into deliberate practice enabled increased training time without physical fatigue, and the time to break-down and analyse the execution of skills and aesthetics. These tools additionally reduced fear around the execution of particular skills due to a more solid kinaesthetic understanding of how the skill is performed.

A key function of these techniques was established as a recovery and rehabilitation tool to enable continued training through cognitive imagery training of class and rehearsal material, and assist in recovery during injury by reducing cognitive blocks restricting mobility. Using these techniques showed significant potential in smoothing the transition from rest to a regular schedule by allowing the dancers to continue strengthening cognitive and kinaesthetic pathways, and providing dancers with purpose and structure during their rehabilitation period.

This study found that exercising imagery training and the modelling technique before a practical creative session, and gathering a handful of stimuli from these processes to take into the studio, has resulted in a more fruitful physical practice. Using these techniques prior to a creative session aided in the focusing and directing of the mind, and preparing the subject for the task ahead – allowing for an easier transition into a flow state. Recording the sessions on video for later reflection provided detailed external feedback on physical appearance, technique, choreographic concepts, and aesthetic, upon analysis; whilst allowing the artist to remain in the zone during the practical session without being concerned of external

appearance or reception. Developing this creative environment and process by utilitising the techniques of pre-performance imagery training and video reflection, stimulated the artist's ability to enter the zone; therefore, resulted in improved creativity, performance, and self-confidence in their ability.

Viewing a broad range of dance composition and partaking in reflection and analysis of this material; encouraged self-development, new considerations of dynamic information, and a greater understanding of the self and the art form. Reflection and analysis stimulated the accumulation of ideas and qualities that created a personal definition of creativity and greater understanding of the art form. Furthermore, a distinction was made between the creativity and quality of movement instigated from imitation, and movement instigated from considered and refined stimuli to connect kinaesthetically into an atmosphere of movement and one's self; this way of moving was discerned to promote confidence and a more positive sense of self.

I have conviction that this study will increase awareness around cognitive imagery training, the modelling technique, and viewing dance for reflection and analysis; and I encourage dancers and other dance professionals to incorporate these techniques into their practice, to discover the benefits for themselves and/or their students. I hope that this study will inspire further research into these areas – especially the incorporation of cognitive imagery training and the modelling technique in injury recovery and rehabilitation practices – as I believe there are exciting discoveries to be made by taking these pathways.

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# Appendix 1

## Dance Imagery Questionnaire (DIQ)

This questionnaire was designed to assess the extent to which you incorporate imagery into your dance participation.

Please answer the questions with regard to how frequently you experience the different types of imagery listed below.

| | Never | Rarely | Not very often | Some-times | Fairly often | Often | Very often |
|---|---|---|---|---|---|---|---|
| 1. I image specific skills (e.g. a jump, a pirouette) being performed perfectly | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 2. I image myself failing to reach my short-term goals, such as getting through a performance or class | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 3. I image myself working hard to reach my goals in dance | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 4. I image myself dealing badly with any difficulties that may arise (e.g. problem with costume) | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 5. I image taking on the different qualities required for a role (e.g. being powerful, being really slow) | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 6. I image mistakes I have made in the technical details of a dance (e.g. places to be, parts of movements) | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 7. I image myself being psyched up | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 8. I image being unable to take on the characteristics of something else (e.g. arm is wing on a bird, spin like a spinning top) | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 9. I image achieving my dreams and goals for dance (e.g. getting a certain role, getting a position in a company) | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 10. I image feeling overwhelmed by what it will take to reach my goals (e.g. hard work, applications and other procedures) | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 11. I image key points in a sequence (e.g. entrances/exits, difficult parts) | 1 | 2 | 3 | 4 | 5 | 6 | 7 |

| | Never | Rarely | Not very often | Some-times | Fairly often | Often | Very often |
|---|---|---|---|---|---|---|---|
| 12. I image how I won't be able to carry out my plans (e.g. what to do in rehearsal) | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 13. I image myself performing with my anxiety under control | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 14. I image focusing on irrelevant things instead of what I need to express while performing | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 15. I image the forces required for or associated with a movement | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 16. I image what the steps I am doing will look like | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 17. I image the forces required for or associated with a movement, but that I still get it wrong | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 18. I image myself performing with my anxiety going out of control | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 19. I image focusing on what I need to express while performing | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 20. I image key points in a sequence going wrong (e.g. entrances/exits, difficult parts) | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 21. I image how to carry out my plans (e.g. what to do in rehearsal) | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 22. I image failing to achieve my dreams and goals for dance (e.g. failing to get a certain role, failing to get a position in a company) | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 23. I image what it will take to reach my goals (e.g. hard work, applications and other procedures) | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 24. I image myself being overly psyched up | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 25. I image taking on the characteristics of something else (e.g. arm is wing on a bird, spin like a spinning top) | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 26. I image failing to take on the different qualities required for a role (e.g. being powerful, being really slow) | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 27. I image the technical details of a dance (e.g. places to be, parts of movements) | 1 | 2 | 3 | 4 | 5 | 6 | 7 |

| | Never | Rarely | Not very often | Some-times | Fairly often | Often | Very often |
|---|---|---|---|---|---|---|---|
| 28. I image myself working hard to reach my goals in dance, but still failing | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 29. I image myself dealing well with any difficulties that may arise (e.g. problem with costume) | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 30. I image specific skills (e.g. a jump, a pirouette) being performed badly | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 31. I image my short-term goals, such as getting through a performance or class | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 32. I image that the steps I am doing will look wrong or bad | 1 | 2 | 3 | 4 | 5 | 6 | 7 |

# Appendix 2

## Example of Imagery Journal (un-edited)

Date: 25<sup>th</sup> July

Site: Home

Image environment: Studio 2

Quality: Not bad, struggled to find detail especially in single movements. Was jumping between internal and external.

Thoughts and feelings: It felt great to image in the quality of this clip. I could image improvising in the form of an improvised 'created phrase' and felt confident that I would be able to replicate it in the studio. Aspects I noted were the aesthetic, dynamic, possible motives behind the choreographed movement e.g. sharp heads and rippling extended limbs.

Note for improvement: I think I need to focus more on perfecting the image of the singular step and analysing where the muscular effort/relaxation may be.

Physical practice reflection: I believe it was pretty successful as I developed confidence in the movement I had chosen – broken past the fear barrier a little but still clumsy. The improvisation was great as I felt confident in what I was doing and that I was able to move in the way I had focused on.

Date: 26<sup>th</sup> July

Site: Home

Image environment: Studio 2

Quality: Pretty decent, but still struggling with the single skills to image without it blurring or skipping some parts of the movement and to understand how the body feels kinaesthetically in the movement (cartwheel into two-legged joined sit). What I noticed was difficult was

staying up to speed – the video I watched had precise movements occurring rapidly at a fast pace and for that to occur in improvisation imagery is rather difficult, let alone physical improvisation.

Thoughts and feelings: It may be that I need to slow down the imagery so that I can clearly achieve shapes and broader movements until I feel more established in the style.

Note for improvement: See above, and for the individual skills it would benefit to practice transitioning in different ways – in and out of the skill.

Physical practice reflection: The similar issues that I noticed in the imagery practice occurred in physical practice, such as speed – not being able to move at the same level of precision and speed that the dancers in the clip were during improvisation, but to get the same quality it is best to start slower to achieve the accuracy and detail of the quality. Practicing transitions in and out of the movement means that the skill is learnt enough to perform without complete focus on the mechanics.