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Dis/Embodied Choreography

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Dis/Embodied Choreography

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Dedication

To my two children, Isabella and Elio Detablan, who have been waiting patiently for me to finish this program and to whom I owe my renewed focus on my own education.

Abstract

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This thesis investigates the intersection of physical and non-physical choreographic practices, culminating in a performed solo dance work titled *Lilith*. In a world increasingly consumed by virtual technology, the investigation is increasingly relevant to explore both in our personal lives and in the field of dance and choreography. This thesis examines the relationship between embodied and disembodied experiences while exploring the affect of these experiences on the mind cognitively and emotionally. In this thesis I investigate performances and written work about other choreographers' investigations into computer-mediated methods of disembodying dance, laying the foundation for my own solo performance. Through experiential research into computer mediated-methods of altering choreography, I have explored the effect of non-physicalized ways of generating choreographic movement. I have equally investigated how a physically impulse driven movement has influenced the choreographic process. In the end, this work explores the tensional forces that lie between the physical and non-physical in a creative, choreographic process and attempts to find ways to create balance between the two.

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Chapter 1: Introduction

This thesis explores, through research and a performed project, the fluid intersection between the physicality of live, embodied choreography and dance movement disembodied from live performers through digital technologies. The investigated question is about the nature of the evolving relationship between the physical and the non-physical in the choreographic process; as the virtual world continues to take precedence in all our lives, the question becomes increasingly relevant, both to ask and to explore in choreography. I am a dancer, dance teacher, and choreographer. My investigations, primarily originating from my dance teaching practice with children and my observations of student learning, took place in the dance studio, where I used momentum and instinctual impulses to physicalize choreographic ideas. I also worked with three-dimensional choreography software in the creation of a virtual dancer. Both components interacted in a final solo dance project called *Lilith*. Informing this research process and final choreography is a review of cognitive learning and education literature that explores theories of the mind and body connection.

When I entered the university to further my knowledge of dance, I began to question the connection between cognitive development in children and physicalized learning. I had begun my career as a dance teacher working with elementary school-aged children 20 years ago and had felt for a long time that children needed more structured opportunities to be physical in their educational lives. I had used storytelling as a means of keeping young students engaged in dance technique lessons, as they often would otherwise lose focus. I was curious about the connections between the spoken language, thought and dance. I wondered if there might be a similar way to use movement to help engage students with learning in the academic classroom. In early 2010, I began to work

with first and second grade classrooms in Austin, Texas. With help from the classroom teachers and the University of Texas' Drama for Schools program, I experimented with using dance-integrated strategies in the math curriculum. I found that the children would get quite excited when moving around the classroom. Although it was difficult to keep them quiet as they became excited, the students were more focused after we'd had a dance session and then sat down to talk about the subject matter. The children also loved learning this way, as reflected in several interviews that I conducted afterwards. I found in my discussions with parents and teachers that they were equally concerned about a lack of opportunity for physicalized learning in the classroom. Both parents and teachers wanted the children to have more opportunity to exercise gross motor skills while learning within the classroom environment and liked the idea of the children dancing while learning. At this point I decided that I needed to have a better understanding of the connection between movement and cognition.

I began to explore the educational theories that connected physicalized learning to cognition. I was introduced to the theory of "embodied cognition," which posits that our body is innately connected to learning and that humans learn through either the physical act of doing or the memory of doing. This was a revolutionary idea, compared to the past theory of a Cartesian mind that worked as a computer which controlled the impulses of the body. In the past, cognitive theorists believed that the mind told the body what to do and the body reacted. There was no deeper connection between the mind and the body, and the body certainly did not tell the mind what to do. Action was a result of the mind's impulses and the mind did not seem to be affected by the body, not in a cognitive way that would lead to understanding. However, cognitive theorists today have challenged this approach postulating that movement is a way of learning. The brain develops based on what the body experiences of the world.

While researching cognitive development theory, I learned that each area of the brain has the potential for developing motor schemata, or movement-driven ways of comprehending information. It seemed to me that even if the body was not the only vehicle for thought, as believed in embodied cognition, the body must be connected to disembodied ideas, or intellectual ideas that live in our thoughts. I began to see myself as a kinesthetic learner and to situate myself in a world of embodied versus non-physicalized learning. I started to see that while many of my peers in the university were more comfortable talking and writing about theory, I was more comfortable exploring theoretical ideas in the dance studio. I had always known that dance was more than just movement. Dance is a language, a way to express oneself. It was clear to me that movement had long been my way of interpreting the world and of expressing myself. I continued to wonder about the connection between movement and cognitive development. I began to question whether active movement was necessary on some level for learning to take place.

As an artist I immediately wanted to take these questions and relate them to the choreographic process. I wondered if there was a way to choreograph using a disembodied process. I began to research the works of Merce Cunningham, who had explored the use of a computer program called Danceforms to choreograph with virtual characters. Danceforms was the first choreographic software created by the Canadian software developer, Credo Interactive in collaboration with Cunningham who was adapting to use increasingly modern technologies in his choreographic process and performance. I decided to follow in Cunningham's footsteps and disembody my own choreographic process. I found while investigating computer-mediated methods of choreographing that I was continually drawn into more complex computer technologies. For example, to use Danceforms in performance, I needed to create a movie out of the

program and then edit that movie in another program. Danceforms led me to Final Cut Pro, an editing program. Unfortunately, I was spending more time in the computer lab than the dance studio. I wanted to explore the relationship between this computer-mediated process and a physically driven one. Where one method explored manipulating choreography without physically moving through it, the other process focused on an embodied experience of working with the choreography. I had to find a way to balance my choreographic work in the dance studio with my choreographic work in the computer lab.

Finally, I began the task of marrying the computer-manipulated choreography with the movement driven choreography as I created the piece, *Lilith*. The dance would explore one woman's struggle within a computer driven society, based on my research findings and the strong opinions I had begun to develop about the individual's relationship to technology as a vehicle for learning and experiencing the world. I named the piece after the main character because I believed that the main character, Lilith, was the embodiment of my research. I wanted the title to reflect the personal nature of the work, to point out the individual in the process. I felt, through my experiential research, that technology had isolated me from much of the world, from my community. I wanted this to be a theme in the performance, and so the piece revolved around the main character, Lilith, and her isolation from the outside world. I had an interest in feminism and also in creation myths when I was younger, which is how I came to the specific name, Lilith. Lilith was said to be Adam's first wife who refused to be submissive to him. It wasn't until she left the Garden of Eden that Eve was created from Adam's rib. The mythological Lilith was a rebel and not afraid to go her own way. *Lilith* was a 20-minute piece with five sections; each section would investigate different aspects of my specific research.

As I continued to develop the piece, my opinions about the presence of technology in education, choreography and our lives were ever present. While the computer-mediated choreographic process lacked in a physical experience within the movement, the studio process was created using my body and its' impulses. Every decision I made regarding the piece had to involve the tensional forces between this embodiment and disembodiment. These tensional forces have become relevant today as virtual technologies have become an integral part of society. In my experience with the research process, there would be many moments where I would feel these tensional forces. There was the tension of wanting to move but being stuck behind the computer, of wanting to make choreography happen in the virtual world that would seem simple but take hours to create, and the frustration of wanting to physically replicate a movement that was perfectly achievable in Danceforms but unnatural and at times impossible to execute in my own body. Our world is a world where people communicate through email, socialize using social websites, and are entertained by video games and Smartphone applications. Our experiences are becoming less embodied, but our bodies need physical experiences of one sort or another to survive. My question about the nature of the relationship between the physical and non-physical is reflected in Lilith's story, the story of a woman adapting to a world dominated by virtual technology.

Chapter 2: Research Underpinnings:

Written theory on embodied cognition

The theory of embodied cognition posits that cognitive learning is necessarily connected to bodily experience. In *Philosophy in the Flesh: the Embodied Mind and Its Challenge to Western Thought*, Lakoff and Johnson claim “the very properties of concepts are created as a result of the way the brain and body are structured and the way they function in interpersonal relations in the physical world.”¹ In other words, perceptions and conceptions are based on our embodied experiences. For example, we know what the word "far" means only because we have had the physical experience of traveling a far distance. According to the theory of embodied cognition, our experiences and knowledge do not exist without a body through which to interpret them.

The authors also state “there is a ‘basic level’ of concepts that arises in part from our motor schemas.”² This means that our most basic understanding of ideas partially comes from our physical interaction with them. Our motor schemas, or physical ways of learning, guide us in exploring and developing our understanding of ideas from a young age. Take, for example, child development specialists E. J. Gibson and R. D. Walk’s visual cliff experiment.³ In this experiment a plate of glass is placed over a gap in the floor, making it appear like a cliff. Infants are called to from their parents to crawl over the glass to their parents. At seven months of age, when test infants have been crawling for 6 to 8 weeks, they resist crawling across the edge to the parent and show accelerated heart rates. On the other hand, infants who are younger and not yet crawling show no

¹ G. Lakoff, M. Johnson, *Philosophy in the Flesh: The Embodied Mind and Its Challenge To Western Thought*, New York, NY: Basic Books, 1999. P. 37

² Ibid. P.77

³ Robert S. Siegler, *Children's Thinking, Edition 4th*, Upper Saddle River, N.J: Pearson Education/Prentice Hall, 2005. P. 178

signs of fear of this task. This tells us that the infant who has not had the experience of physically moving through the space does not understand that if she walks off of a cliff, she will fall. It is only through the child's physical interactions with the world that she is able to understand it.

As a dancer and a teacher it would be impossible to review the work on embodied cognition without connecting the theory to dance and learning. If it is true that we learn best when embodying material then wouldn't dance be an ideal vessel for knowledge acquisition? Dancers are consistently using math to learn how to dance, using angles, geometric shapes and spatial-relations. One could explore shapes and angles by creating them with the body. Spatial-relationships could be created with other dancers through duets and trios. The opportunities to explore math ideas through dance are limitless, guided by the theory of embodied cognition. Clearly movement has an impact on the development of the brain, but what would happen if movement was taken away from the learning process? Furthermore, what if movement was taken away from the choreographic process? As a choreographer I began to wonder what would happen if the process of choreographing was disembodied. I began to explore the balance between the body and mind within the choreographic experience.

Related literature on cognitive development

Piaget teaches us that children develop and learn through repetitions and cycles similar to the format of song and dance. In his book, *The Psychology of The Child*, Piaget states "the organism is never passive, but presents spontaneous and global activities whose form is rhythmic."⁴ This implies that organisms have a constant internal rhythm that manifests itself physically, sometimes with no functional reason. This rhythm might

⁴ V. Piaget, B. Inhelder, *The Psychology of The Child*. New York: Basic Books, 1969. P. 6

also explain the social dancer who cannot keep herself from dancing when she hears and feels the rhythm of music on the dance floor. Piaget goes on to describe how rhythm in batrachians (frogs) results in reflexes rather than reflexes creating rhythms. On first consideration this statement seems to be reflexive of the songs that frogs sing, which Piaget says are rhythms that are released through the reflex of croaking. Upon further observation it seems that rhythm is also expressed through the heartbeat. If this is true, then rhythms would appear to be an intrinsic knowledge in human beings as well as in frogs. Rhythms occur in the human body naturally, and then manifest physically through uncontrollable impulses like the heartbeat. As a choreographer, I wondered if these impulses could guide an organic choreographic process.

Not only does dance embody Piaget's belief in rhythm creating the impulse for movement, it also creates an active, repetitive environment that allows time to create balance in the cognitive process. Piaget theorizes that assimilation and accommodation are ways that infants learn through repetition. Assimilation means taking in new information which creates a sense of disequilibrium in the child's brain. Accommodation happens as a result where new schemata are created to process the new information. More simply put, cognition is a way of creating balance in the brain so that the child can understand the world through a process that involves repetition. Through embodied cognition we understand that this balance is created partially through physicalized experiences. I wanted to see how repetition could be used in the choreographic process either to generate new impulses or to aid in embodying the creative process. Most importantly, there seemed to be connections between the ways that we learn in our cognitive development and the ways that the choreographer works in the studio. I recognized that one way I choreographed involved repeating one movement until the

momentum of it led me to another movement. I decided to explore this more purposefully in my studio process.

Vygotsky theorizes that learning is accomplished through social interactions. In the past few decades, American society has invested more time in virtual social environments with the creation of internet sites like Facebook and Myspace. According to Vygotsky, it is important to create environments where our children have social opportunities to learn to aid in their cognitive development, especially in the classroom. Today's elementary classroom provides virtual social opportunities by asking children to create websites in the classroom and visit each other's sites. This is used as a way of teaching young children how to work on the computer and use the internet at a young age. It is also an interesting example of learning through social activities using a disembodied medium, but what about the importance of the embodied experience in learning? What happens to these children when they become adults? How do they socialize then? This question would stay on my mind and develop into an opinion about the social ramifications of a non-physicalized practice, including social interactions that I would continue to explore through Lilith.

In summary, based on Piaget and Vygotsy's theories, creating a learning environment using dance taps into innate knowledge (rhythm), active learning (through movement), repetitive learning (assimilation and accommodation), and social learning (cooperation.) My fascination with movement in education led me to question the importance of the mind body connection and the deeper concern of what would happen if we, as a society, began to be more intrigued with non-physical experiences than with embodied experiences. I began to explore the intersection of physical and non-physical, of mind and body, and of technology and the organic. I wanted to see what lay at this

intersection, if it had been fully explored, and how the experience of the exploration would affect me as a choreographer and dancer.

Literature concerning technology and live performance

As I continued to explore the balance or lack thereof between computer technology and movement in the classroom, I became curious about the use of computer technology in live performance. According to Amy Jensen, the chair of Theatre and Media Arts at Brigham Young University and author of *Theatre in a Media Culture*, “theatre in the age of technology has changed (not necessarily for the better or worse) because of the mediated environment in which it has come to exist.”⁵ There is an expectation from the audience that newer technologies will be incorporated in live performance and artists are fascinated with ways that technologies can enhance their vision. Jensen goes on to describe how media, or mechanically delivered messages, have become an ever-present part of daily life and have an evolutionary effect on live theatre performance. “The language of theatrical space changes as the world changes.”⁶ As technology becomes more relevant and present in live performances, artists must strive to find balance between the technologies used and the artistic vision. Artists using technology in performance must have a deeper understanding of the audience’s relationship to these technologies and how the audience will interpret works that use media in performance. Because our society is used to seeing media and technology everywhere, on billboards, in the classroom, on the phone; there is a new expectation of theatre and entertainment.

I have seen many productions where there is a projected element, or a computer-manipulated element that relates to the production. I often find that the technology is a

⁵ Amy Jensen, *Theatre in a Media Culture*. North Carolina: McFarland and Company Inc., 2007. P. 3

⁶ Ibid. P. 49

distraction, a novelty, or an unnecessary addition to the live performance. According to Jensen, “it is the subconscious impact that the presence of technology and mediated messages has on us that must be accounted for in the production of theatrical events.”⁷ In other words, when creating works with technology, the choreographer must take into account the ways that these technological elements affect the audience even on a subconscious level. She goes on to explain that the audience members “each have a personal relationship to the message, not because of its content, but because of its medium.”⁸ Clearly, creating balance between the choreographer’s vision and technology becomes more complicated when taking into account the relationship that the audience has with the mediated technology.

As a choreographer, what interested me the most about technology was the capacity it held for enabling the creation of a hybrid form of dance by disembodiment of the choreographic process. I was intrigued by the space between the physical and non-physical when technology is utilized as part of the creative process and performance. Video game entertainment seems to be developing at a rapid pace within this space, creating physically interactive games using Nintendo Wii remotes and the Microsoft Kinect for the X-box. With these games the player’s movement is detected three-dimensionally and then used in game play. Jensen believes that “the language of technology and mass-media has created a hybrid space in the mediated American theatre.”⁹ Certainly exposure to mediated entertainment and gaming has influenced the perspective of audiences. In my investigations I hoped to explore this hybrid space and to find my own way of working with computer technology while maintaining a connection

⁷ Ibid. P. 64

⁸ Ibid. P. 71

⁹ Ibid. P. 189

with the embodied experience. I also wanted to see how a non-physical process would affect the final choreography and my knowledge and experience of it compared to a more traditional style of choreographing, using my own dancing impulses.

Related dance works

I began to investigate dance works that involved digitalized dancers. A forest of vertical lines slowly appears on stage. The depth of the lines becomes evident as a larger than life human like figure enters the space, walking around each of the lines. The shadow or reflection of the figure follows below it, adding to the depth and atmosphere of the moment. The animated figure looks like the ghost of a human body without any specific gender indications, like breasts or defined muscles. Instead, it appears that lines have been scribbled randomly over a human body, and then the body has been removed. These lines are soft and curvy, however, and the body is petit and weightless. The figure reads as a feminine body as she moves with fluidity and delicate, intentional steps. She is skinny, with thighs that are barely larger than her calves and her feet are quite small and articulate. She also leads with her breast bone and seems to be searching for something or someone as she turns her head side to side. Her toes are pointed and her legs turned out as she steps through the space. This stylized walk reminds me of a young woman wandering the woods seeking her lost love in an old romance novel or of a ballerina's stylized walk while she enters the stage searching for something. Although the avatar is alone in the beginning, one senses from the first moments of Merce Cunningham's *Biped* that the performance is about partnership. As a choreographer viewing *Biped*, I was curious about the ways that computer technologies are used to create virtual dancers, to disembody the dancer and yet to support the artists' vision in live performance. I use the term virtual dancer here and throughout this paper to describe a projected dancer that may have been

created through filming a human body but is projected as a digitalized body that no longer appears completely human.

Paul Kaiser of the Open Ended Group began his first collaboration with Merce Cunningham in 1998 on the digital piece *Hand-drawn Spaces*. Kaiser took dancers from the Cunningham Company and attached them to motion sensors that recorded the dancers' movements as points in space. The data they collected was then read by a computer and manipulated by the artists to look like chalk stick figures rather than photographic replications. The process of using motion capture to disembody the dance was of great interest to me, and I decided to spend some time in a motion capture studio in the fall of 2010. There was something about this process which I will speak to later in this thesis that took the impulse and even human quality out of the movement. In Cunningham's work, the male and female figures are impossible to distinguish from one another. Cunningham asked Kaiser to cut and paste the movement of each dancer so that the figure created is sometimes the male and sometimes the female but always appears as the same virtual being. In this way Kaiser was able to create a completely androgynous dancer, void of any identity. This was of special interest to me as it would appear to take the person themselves out of the movement. It would imply that the actual body executing the movement is not as important as the movement itself. In an interview with Kent de Spain, Kaiser expressed that the bodies for *Hand-drawn Spaces* "were not marked sexually. They were abstracted from any kind of individual or sexual identity."¹⁰ The androgyny and universality of the figures in *Hand-drawn Spaces* was successfully created using computer manipulations on human movement.

¹⁰ K. de Spain, P. Kaiser, "Digital Dance: The Computer Artistry of Paul Kaiser." *Dance Research Journal*. Vol. 32, No. 1 (Summer, 2000), P. 22

I decided to examine these virtual characters more in depth so that I could see how I might use similar technologies to create virtual dancers and to disembody my own choreographic process. Although the characters in *Hand-drawn Spaces* maintained their androgyny, they were more like sketches to be viewed in a gallery. Still, Cunningham's choreographic interests lay in how technology could be used in live performance. He came back to Kaiser in 1999 and asked him to collaborate on *Biped*, which would use similar figures in a live dance performance. Kaiser's group worked in the same way to create the avatars for *Biped* as they had in *Hand-drawn Spaces*, intermixing male and female dancers and drawing soft lines on the body that deemphasized musculature. The avatars in *Biped*, however, appear much more feminine than the ones in *Hand-drawn Spaces*. These avatars lose the broad shoulders of their predecessors and instead of thick chalk lines; the lines are thin and scribbled. The thinness of the lines adds to the petite effect on the body. These subtle differences between the virtual dancers of *Hand-drawn Spaces* and *Biped* make the new figure, which was still created from both male and female dancer, appear feminine but not human. I decided that I wanted my virtual avatars to seem similarly androgynous. I also wanted to explore the relationship between the disembodied virtual dancer and the live organic dancer in performance. *Biped* was for me an example of a piece where the audience could see a relationship between the live and the virtual dance, between embodied and disembodied, but Cunningham did not attempt to explore this relationship. Instead he placed them together by chance as separate dances that would be performed simultaneously.

Biped interweaves virtual media and dance quite poetically, however, where the virtual and live dancers are never in direct contact with each other. Examining this piece would inform my approach to creating virtual dancers in *Lilith*. The approach that Cunningham and Kaiser took reflects not only the aesthetic that they wanted to achieve,

androgyny of characters, but also the limitations of combining the technology with the organic dancers. I hoped to have an opportunity to explore ways that I could use computer technology in the choreographic process, but wanted to keep in mind the narrations that would be created by the audience in performance. For example, *Biped* is framed in a heteronormative world where individuals seek partners of the opposite sex to dance with, as seen in moments where a solo avatar is searching the space while a male/female duet is performed live. The solos throughout the piece, which are performed by the virtual and live dancers, seem to reflect a need for or loss of a partner. The live bodies in their male/female pairs serve to gender the virtual bodies and suggest narrative concerning the necessity of male/female pairings when combined. I began to consider what narratives might be created by the relationship between virtual and organic dancers in *Lilith*.

I looked to Bill T. Jones' *After Ghostcatching* because although the same extensive process to collect and recreate motion capture data was used as in *Biped*, a contrasting masculine character who maintained his original identity was the outcome. Here was a piece where the choreography was again disembodied, however the creators wanted to keep the dancers personality in the movement. Kaiser asked choreographer Bill T. Jones to collaborate with The Open Ended Group on the new film, *Ghostcatching*, which would be exhibited at the Cooper Union School the same year that *Biped* premiered in Berkeley, California. The group was interested in working with Jones' because of the way Jones' identity is reflected in his choreography. Jones stated in the beginning of the process "I do not want to be a disembodied, denatured, de-gendered series of lines moving in a void."¹¹ Both Jones and Kaiser wanted this new virtual dancer

¹¹ B. T. Jones, S. Eshkar, P. Kaiser, *Ghostcatching: a Virtual Dance Installation*, New York: Cooper Union School of Art, 1999. P. 39

to still appear as Jones. However, the nature of creating this body would clearly mean disembodying Jones into a “series of lines moving in a void.” The original exhibition at Cooper Union included photographs of Jones attached to motion sensors that would record the movement data for the film, reconnecting the disembodied to the embodied Jones for the audience. One image reveals Jones naked with sensors attached to his body including one attached to his penis. Although Jones’ penis is not visible in the film, the photograph included in the exhibit reifies Jones’ gender and sexuality for the viewers. Where *Biped* was performed with live dancing bodies moving with the avatars, the virtual avatars in *Ghostcatching* stood alone. When viewed beside photographs of Jones, however, they appeared like ghosts, the disembodiment of Jones, but they never lost the essence of Jones’ body and masculine form. Clearly Kaiser’s group had to go to great lengths to keep the connection between the virtual and the organic by presenting the two together in the final display.

After Ghostcatching is a visually enhanced version of *Ghostcatching* that is stripped of the photographic images of Jones himself. Both films contain the same dance with the same soundtrack, however the virtual dancer is removed even further from its’ human counterpart in *After Ghostcatching*. The film opens with a series of jagged lines that are piled on the bottom of the screen. There is no clearly defined space in this world, but the lines resemble mountains forming as they begin to reshape and grow upward. They slowly evolve into stick figures. As the stick figure bodies continue to move, they thicken and become more human in form. Lines emphasize the musculature of the body and broad shoulders. Various reviews describe the body as “clearly male, clearly Jones.”¹² These virtual bodies contrast the *Biped* virtual dancers whose lines are soft,

¹² Danielle Goldman, “Ghostcatching: An Intersection of Technology, Labor, and Race.” *Dance Research Journal*. Vol. 35/36, Vol. 35, no. 2 - Vol. 36, no. 1 (Winter, 2003 - Summer, 2004), P. 72

curved and have more petite proportions, reading as feminine. The new figure is purposefully male. Ann Dils describes the piece in her article saying:

Jones movement might have been made to inhabit very different kinds of bodies, slight bodies, stout bodies, or womanly bodies. But none of this occurs. The ghosts don't look like Jones, but they look male.¹³

Although the virtual characters in *After Ghostcatching* appear at times abstract, they always feel quite human and quite masculine. There was an undeniably conscious choice for the Jones' figure to maintain his masculinity. I began to consider at this point how I wanted my virtual dancers to appear. Would I be the origin of these characters or would I use Danceforms to create them? Would the virtual dancers be androgynous or identifiable? I wanted to see how the gender of the virtual characters created by Kaiser influenced the narratives that the audience would create. I also continued to explore ways that I would choreograph using computer technologies not only to create, but to influence the approach to my choreography.

The sound score, consisting only of Jones' breath and voice, in the first moments of *After Ghostcatching* suggests wind, adding depth to the piece's already cold atmosphere. At the same time as the virtual bodies begin to manifest in the beginning of the piece, we hear Jones' deep breathing and then his thick and masculine voice, "A, B, C, D." The sharp visual angles and lines in conjunction with Jones' spoken alphabet create an unemotional atmosphere. I had not yet begun to consider sound and voice in my choreographic process, but hearing Jones voice used as a soundscape brought a new lens for computer manipulation into view. As a young adult, I had studied choreography with Joe Goode who had brought dialogue into composition as a choreographic lens. Before coming to Goode, I had experience as an actress, studying with Actor's Studio, and so

¹³ Ann Dils, "The Ghost in the Machine: Merce Cunningham and Bill T. Jones." *PAJ: A Journal of Performance and Art*. Jan 2002, Vol. 24, No. 1 (PAJ 70), P. 98

this choreographic lens was one that I was skilled in. Viewing *After Ghostcatching* made me wonder if there was a way to work with voice and technology as well. Voice was a way to guide the audience perspective in Jones' work. Jones' voice is a constant reminder that the character dancing is male. At times he attempts to mimic a female voice from his story, but the voice is never feminine. This creates a sense that the feminine is missing, and wanted. The distorted voice taken with stories of the many women in Jones' life suggests that the figure is incomplete without its' female counterpart. I also wonder if this digital character is incomplete without his live, organic counterpart. Voice added depth to the narrative that the audience creates watching *After Ghostcatching*, a narrative that develops because of the disembodied Jones' and the soundscape that his breathing generates.

After working with Kaiser on *After Ghostcatching*, Jones stated that We (choreographers/dancers) have to be careful that we don't get left behind, or that we don't miss an opportunity to share what we know about the human body and what we love about live performance, share it with the future; and that we don't become so protective of this domain that we have which, as we know, is undervalued and underfunded, that we don't have the courage to step out.¹⁴

Jones is warning the choreographer to embrace the ways that technology can enhance the art of dance so that dance will continue to evolve and be more relatable to modern day audiences. Although by separating the computer generated work from live performance Jones may not have realized the full potential of collaborating with Kaiser, he did see the importance in exploring these computer generated methods. I believe that Jones could have "stepped out" even further by incorporating the computer manipulated work that he did with Kaiser into a live performance. It is interesting to note that Jones was nervous in the beginning of the process that he would be disembodied, however he left his digital

¹⁴ Kent de Spain. "Dance and Technology: A Pas de Deux for Post-Humans." *Dance Research Journal*. Vol. 32, No. 1 (Summer, 2000), P. 5

figure disembodied and disconnected from an embodied world by allowing the piece to stand on its own as a dance film, rather than as a live performance experience.

Kaiser describes the collaborative process with Jones and Cunningham saying “meaning lies between us-not only between those of us who made it, but also those who now see it.”¹⁵ The interpretation of these pieces is created not only by the artists’ intentions, but through the audience perspective, a point that Jensen is also eager to make. According to Kaiser, “Whereas *Hand-drawn Spaces* reveled in the freedom of abstracted motion, *Ghostcatching* would question it.”¹⁶ The abstract characters of *Hand-drawn Spaces* are reflected in the characters of *Biped*. Although these characters are somewhat androgynous, they reify gender stereotypes within a heteronormative culture. The Open Ended Group quite beautifully blends lines, movement and text to create a contrasting male dominated atmosphere that is embodied by Bill T. Jones’ virtual dancer in *Ghostcatching* and *After Ghostcatching*. The audience never loses sight of the strength and power of Jones’ character and masculinity even though his character is disembodied. Where *Biped*’s abstracted motion creates a romanticized feminine world full of male/female partnerships, *After Ghostcatching* creates a male dominated atmosphere that seeks the same male/female relationships. The audience creates a narrative to both pieces through their perspective, however *Biped* balances the computer and movement driven world where *After Ghostcatching* almost completely loses any relationship to the material world in its’ presentation.

Melbourne based dance company Chunky Move premiered the piece *Mortal Engine* in 2008 at the Sydney Festival, ten years after the completion of *Biped* and

¹⁵ B. T. Jones, S. Eshkar, P. Kaiser, *Ghostcatching: a Virtual Dance Installation*, New York: Cooper Union School of Art, 1999. P. 48

¹⁶ Ibid. P. 39

Ghostcatching. *Mortal Engine* re-imagines the ways in which technology and live performance can be intertwined in the creative and performative processes. In interviews on their web site, artistic director and choreographer Gideon Obarzanek has stated that he is not a purist but is interested in exploring creative expression using different forms. I am reminded of Bill T. Jones quote about stepping out and not being afraid of stepping into a new dance expression that involves technology. Jones statement reflects the apprehension by choreographers to alter the pure form of dance, while Obarzanek is eager to push past these self inflicted limitations. I use the term pure form here to mean movement without computer or technological alteration. Unlike Jones, Obarzanek has embraced technology as a part of the creative process.

Mortal Engine is a dance-video-music-laser performance using movement and sound responsive projections to portray an ever-shifting, shimmering world in which the limits of the human body are an illusion. Crackling light and staining shadows represent the most perfect or sinister of souls. Kinetic energy fluidly metamorphoses from the human figure into light image, into sound and back again.¹⁷

Obarzanek uses various interactive technologies to move beyond the abilities of the human body and create a piece that portrays something beyond the physical limitations of the material world. These outer boundaries reflect something of the human spirit and condition, however. It is clear to me from watching videos of *Mortal Engine* and reading these types of descriptions from the company website that Chunky Move has created a piece of work that uses dance and technology in conversation with one another to bypass physical limitations rather using the various mediums as separate entities that support one vision. The technology informs the dance and the dance informs the technology. The space between the physical and non physical is completely blurred.

¹⁷ "Mortal Engine." chunkymove.com.au. 10 December 2011. Chunky Move. 10 December 2011. <<http://chunkymove.com.au/Our-Works/Current-Productions/Mortal-Engine.aspx>>

In a section of *Mortal Engine*, the stage is a white rectangle while the walls are empty, dark, complete blackness. A male dancer seems like a shadow standing on the front edge of the white stage with only his face illuminated. A woman curled in a ball is on the ground behind him and covered in the same blackness as the walls. The black shadow on her spins away, like hundreds of bees fleeing to capture the male soloist. Later, the virtual bees pulse away from and drive into the man and woman as they dance a duet, writhing on the floor. Are these live dancers being consumed by unrealized forces? The projections and live dancers appear to be one entity, pulsing together to create a common language. How does Chunky Move Dance Company achieve this effect in *Mortal Engine*? They do it with interactive technology that senses the movement and heat of the bodies on stage to create both sound and visual projections.

One difference between this work and that of Jones, Cunningham and Kaiser, is that Chunky Move does not use human forms in their projections. I wondered if there was a way to use digital characters that would represent the computers in a more human way and still interact with the live dancers. I was more interested in bodies, in the embodiment of technology and what that would mean or look like. What interests me is the difference between the live, warm, human bodies and the cold, mechanical representations of technology. In an era where computers are becoming more human, having literal voices that respond to human commands, I believe that a more human representation of computer technology has important social relevance and is necessary in the hybridization of live theatre performance. I again began to question the relationship between the computer-mediated and impulse driven processes. What lay in the space between the human bodies and the computerized projections? Was there a way that they related in the process or performance that had not yet been fully realized? Regardless of the visual manifestation of the computer technology, Chunky Move achieved a beautiful sense of

balance between the digital and material world in *Mortal Engine*. I hoped to create a similar balance between a disembodied virtual character that represented computer technology and a live, organic dancer. I hoped that these two representations would reflect my research into physicalized and non-physicalized choreographic processes.

Chapter 3: Creative Process

The disembodied choreographic process

I began my experiential research by attempting to disembody the choreographic process. I wanted to see what type of movement would emerge from a disembodied process. Would I remain connected to the work? Would this present new ways of moving or an easier way of choreographing and what would the effect of working this way be on my memory and connection to the piece? My first experiment in disembodying the choreographic process was an exploration of the musical composition structure of serialism in conjuncture with Merce Cunningham's chance dance. Serialism appeared in musical compositions in the early twentieth century. It came as a reaction to the emotionally based music of the Age of Romanticism much like Cunningham had reacted to the emotionally based work of Martha Graham when he left her company in the mid twentieth century. Serialism is a reflection of the "never ending-search for the best structural relationship in composition and construction."¹⁸ To find these structural relationships, serialism uses simple math ideas like prime (meaning the original number or starting point,) inverted, retrograde, and retrograde inverted numbers. For example I took 748159263 as the prime number. To invert the number by one, I added the number one to each single digit, creating 85926374. Retrograding the prime number reverses its order, making it 36295847. Inverting the retrograde by one created the number 47306958. I also inverted the prime number by three, 07148596. With this equation, ideas are repeated, but the numbers are never exactly the same, creating wholeness within the serialist's musical composition. Using serialism in music composition, the melody, tempo, dynamics, and all other elements of the music are represented by rows of numbers

¹⁸ Markus Bandur. *Aesthetics of Total Serialism: Contemporary Research from Music to Architecture*. Boston: Birkhäuser, 2001.P. 64.

using this equation. I decided to use this method, only with the body and movement, to choreograph using serialism. I took the previous numbers and put them in a row, using each row to describe a motion.

7 4 8 1 5 2 6 3	Movement of the Arms
8 5 9 2 6 3 7 4	Movement of the Legs
3 6 2 9 5 8 4 7	Tempo
4 7 3 0 6 9 5 8	Pathway travelled
0 7 1 4 8 5 9 6	Movement of the Spine

Table 1: Numbers associated with body parts using serialism.

I then complicated this equation by using the retrograde of every other column.

0 4 1 1 5 5 6 6	Movement of the Arms
4 5 3 2 6 9 7 8	Movement of the Legs
3 6 2 9 5 8 4 7	Tempo
8 7 9 0 6 3 5 4	Pathway travelled
7 7 8 4 8 2 9 3	Movement of the Spine

Table 2: Retrograde of Table 1.

Finally, I translated each number into movement, and set out to translate the formula onto my own body.

	Arms	Legs	Tempo	Path	Spine
1	1st	Plié	slow	still	neutral
2	2nd	straight/together	super slow	forward	flexion
3	3rd/right high	right tendu front	medium	backwards	extension
4	3rd/left high	right tendu left	fast	right	lateral left
5	4th/right high	right tendu right	super fast	left	lateral right
6	4th/left high	right tendu back	pause	forward left	supine
7	5th	left tendu front	gaining speed	forward right	prone
8	both arms left	left tendu left	slowing	backward left	twist left
9	both arms right	left tendu right	flailing	backward right	twist right
0	hands on heart	left tendu back	barely moving	spinning	roll

Table 3: Translation of numbers to movements of specific body parts.

In 1953, Merce Cunningham choreographed “Untitled Solo” using chance operations to separate the movements of each part of his body; arms, legs, head, torso. Cunningham took the body out of the choreographic process and used a disembodied method of creating the dance using chance, then reinstating the body when dancing the choreography. I attempted to do something similar only using serialism instead of chance methods. Roger Copeland describes Cunningham’s solo saying “his head, arms and legs appeared so oblivious to one another that they could have been grafted together from three different bodies, moving at three different speeds.”¹⁹ Cunningham’s movement appeared as if each part of the body was separate and not related. This is how I felt when I danced my serialism dance. It was difficult to connect what my upper torso was doing with what my legs were doing. At times it was as if the top and bottom of my body were in a tug of war, but I stayed true to my formula. In this way, I created a very short solo through a disembodied method that I performed in front of my class. I wondered if there was a way to use Danceforms, which I had only read about at this point, to plug these numbers into a computer and have the computer completely create the dance using my formula.

If I was to investigate a disembodied choreographic process using computer technology I would need to master the program Danceforms. Fortunately, I was able to study Danceforms independently with Yacov Sharir, who was given the 1997 Innovative Use of Instructional Technology "Virtual Reality & Cyberspace in the Arts" award. The process of learning Danceforms was slow at first, starting with creating a stage and an avatar. Then I began to manipulate the angles of the virtual dancer’s feet, hands, arms, legs, torso, and head. This was my first step into any type of virtual technology, which

¹⁹ Roger Copeland. *Merce Cunningham, The Modernizing of Modern Dance*. New York and London: Routland, 2004. P. 185.

has redefined the way that we perceive embodied experience. Compared to the process of stepping into a studio and choreographing, this choreographic process was arduous and time consuming. The dance vocabulary in Danceforms is purely Merce Cunningham technique and ballet. Although I have years of experience studying these styles, I am more comfortable choreographing within a released style of dance which uses momentum in the choreographic process. There was no way to create actual momentum in the Danceforms program, so I would have to imagine what I thought the momentum would do to my avatars as they danced. I struggled to keep my bodily experience out of the conversation I had with choreography in this program. However, to create more personally stylized moves that related to my choreographic and dance experience, I would have to go into the program frame by frame. It could take hours to perfect only twenty-seconds of material. After a semester of studying, I was able to master Danceforms, but the possibilities of using material generated through the program in performance seemed limited by the program itself.

In the spring of 2011, I was commissioned to create a dance piece called *Jane* as part of the Cohen New Works Festival at the B. Iden Payne Theatre in Austin, Texas. Though working with Danceforms was arduous and limiting, I forced myself to commit to creating a film using the program to choreograph five dancing avatars that would be projected during the performance. I also danced live on stage in *Jane*, at times mimicked movement from the projected avatars. I attempted to create a relationship between the avatars and myself by exploring the computer generated movement and spatial relations with the projection. I wanted to investigate the relationship between the two worlds, rather than present them as two separate dance forms. I wanted to see how the virtual and organic could connect and harmonize, rather than creating two separate pieces that would perform in dissonance. There were three major problems that were revealed in the final

performance that I would have to remedy if I was to push forward with this work. First, the appearance of the avatars was too simple to reflect more recent trends in technology. They looked like a series of lines drawn to represent a human form, but they also seemed flat and lifeless. The second issue involved the relationship between me as the live dancer and the avatars. The avatars were projected on a twenty foot wide piece of fabric that seemed to overtake the stage. I was consistently concerned with dancing in a way where I was not directly in front of the projections. This was a mistake, because in the end, I appeared to frame the avatars as the focus of the performance. Lastly, there was no balance between the avatars and myself. Both the organic and virtual dancers were moving constantly, and there was not an easy indication of where to look when. Moving forward, I would have to consider how I wanted these avatars to appear, what the spatial relationship would be between them and myself, and how I would balance the focus between the virtual and the material.

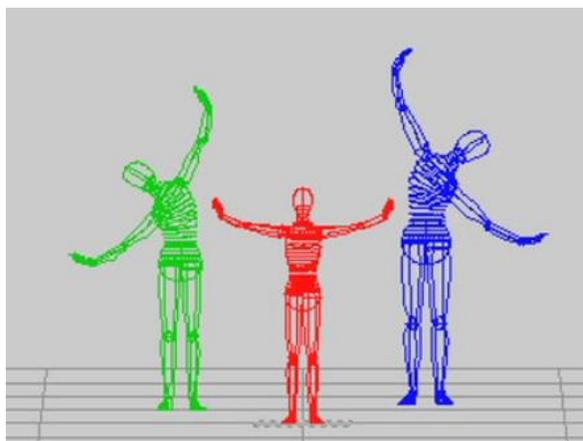


Figure 1: Virtual dancers created in Danceforms for *Jane*.

In the summer of 2010, I had visited the Virtual Reality Lab at the Center for Visual Science at The University of Rochester in Rochester, New York. My

brother, Keith Parkins, integrated and assembled the hardware and software necessary to develop rich immersive environments for the shared resource lab in addition to writing virtual reality and augmented reality applications for vision research. He was able to give me a personal tour which had a huge affect on my fascination with the world of virtual technologies. The lab had been built with the intent of exploring “how the brain makes sense of information involving peripheral vision and other cognitive processes of perception.”²⁰ This research combined my interest of cognition and virtual environments and the blending of physical and non-physical experiences. My brother asked me to place my right index finger in a metal finger glove and then put on a headset with a plastic pair of three-dimensional glasses on.



Figure 2: Wearing the headset, glasses, and glove at the Virtual Reality Lab at the Center for Visual Science.

I placed my gloved finger in an open space and was able to virtually feel a shelf and a button that were projected into the space but were not physically there. I was in disbelief of my own experience. I then took off the glove and glasses and stepped inside a separate

²⁰ Susan Hagen. “The Mind’s Eye.” Rochester Review. Vol. 74, no. 4. (March-April 2012), P. 33

room with a 7-foot-tall semicircular screen that surrounded my entire field of vision. Projected on the screen was of a virtual city that I was able to drive a car around using a steering wheel and pedals to accelerate and stop. The experience of driving around this virtual city was not as fascinating to me as what happened when I crashed the car. The car would speed out of control and be thrown in circles or run straight through a wall. These experiences that would have severely damaged my body had they occurred in real life had a very strange effect on me within this virtual environment. It felt as though my brain was being shaken inside my skull, and I felt extremely nauseous. I am clearly not a neurologist, nor do I have a significant understanding of the science of the brain, but this feeling has stayed with me and puzzles me still. What could the positive and negative effects of this type of technology be on the brain?



Figure 3: Driving through the virtual city.

My brother suggested that I might be interested in working with motion capture technology. A group of researchers from his lab in Rochester had relocated to The University of Austin at Texas and had built a motion capture lab there. Keith put me in contact with Rahul Iyer, a graduate research assistant in the Center for Perceptual Systems at the University of Texas at Austin. Mr. Iyer helped me gather motion capture data of myself dancing in a small, carpeted room hidden in the basement of one of the

engineering buildings on campus. I put on a black unitard that was made for a man much larger than me and had motion sensors mounted all over the torso, legs and arms. I also wore a baseball cap and oversized footies that also had motion sensors.



Figure 4: Wearing the motion capture sensors.

I was reminded of Bill T. Jones work with Paul Kaiser. This process took me completely out of my body, wearing an oversized suit and dancing on a carpet. Although the movement I generated was not created by a computer program, it was certainly informed by this scientific process. I recorded more than twenty-one to two minute sequences and then sent them to my brother, Keith, to transpose into a format that I would be able to read using Danceforms. I had hopes of using the data in a projection later in performance. Unfortunately, the process of translating this data, even for my brother, the computer programmer, was difficult. Keith would take my measurements from each joint in my body to every other joint before he could begin to make sense of the data. Even then, it was almost impossible for him to create a body from this cloud of data. I also was completely displeased with the movement generated in this process. It was stiff and

amateurish judging from raw video footage that I had taken of the session using my Flip camera. I feared the session would not be useful as far as a product was concerned, but it gave me experiential insight into the process that Kaiser used with Jones and Cunningham. Jones had stated that the process was limiting, as it was difficult to be organic in a small room that was not created with dance in mind. This rang true for me as well. This approach to choreography, however, would disembody the choreography and inform my approach to creating virtual dancers for *Lilith*.

After my failed attempt to work with motion capture, I decided to try a different approach to create virtual manifestations of the computer for *Lilith*. I decided to film myself moving and dancing, and then use effects in Final Cut Pro to create an aesthetic that looked similar to Kaiser's figures. Although these characters would not be created using computer generated choreography, they would be disembodied and then altered in a computer program. This would appear at first glance to be less time-consuming, but the projections turned out just as arduous using this new method. However, the choreographic process would be simplified and the appearance of the virtual dancers more mature. Technology is clearly complicated and time consuming, which is why so many choreographers avoid it. It was necessary for me to find collaborators who related to my artistic vision and could bring their talents to fully realize the potential of the work together if I was to continue working with these computer technologies. I found a colleague, Eric Gazzillo, to work with me on the virtual dancers, who would be disembodied manifestations of my own body. I wanted to create these disembodied dancers and then explore the relationship between them and a live organic dancer. In this way, I could embody my exploration of a relationship between the computer driven and impulse driven worlds. I would create virtual dancers who reflected the research on embodied and disembodied methods in choreography and I, the organic dancer, would

represent the struggle to maintain connection with the physical world while exploring these methods.

The process of creating these new figures took four steps. First Gazzillo would film me dancing and performing simple gestures that embodied what I believed to be a computer attempting to relate or control the character, Lilith. I based the movement on sections that I had created in *Danceforms* which appeared pixilated and quirky, rather than fluid and organic. Informed by my research on *Biped* and *After Ghostcatching*, I decided to make the new virtual dancers androgynous. Next I would use Final Cut Pro to cut and paste my dancing body into a sequence that would relate to the live choreography performed on stage. I would alter the film further by removing the background, leaving only the dancing body. Finally, Gazzillo would alter the body, also in Final Cut Pro, using various effects so that my body was no longer identifiable but still looked like it had been derived by a human form.



Figure 5: Virtual dancer filmed and manipulated with Final Cut Pro.

We attempted to add a strobe effect that would pixilate the movement further, but this effect looked too much like a mistake and was easier to create in the choreography than

in the program. Gazzillo also added a new background so that it would look like the virtual dancer lived in a separate world. Although these are three simple steps, hours of labor would go into finding the appropriate effects to create an aesthetic that Gazzillo and I could agree upon. The process was collaborative, and resulted in a much more advanced look than I had previously created using Danceforms. However, the virtual dancers in the end looked too recognizable, too human, too much like me. The background seemed too complex and I was still not pleased with the final result.

I decided to start from scratch working with a new collaborator, Taylor Kirk. Taylor had been brought on board to compose the music and soundscape for *Lilith*; however Kirk also had experience working with projections and three-dimensional animations. Less than two months before the final production, I decided that the virtual dancers were not progressing quickly enough and did not appear the way I had envisioned. I bought a Microsoft Kinect, which senses three-dimensional motion and uses it in game play through an X-Box, which translates the data to the screen. We took the data, however, and altered it through several computer programs. Kirk used Max MSM to create a patch that allowed us to use the data without the aid of an X-Box, hacking into that technology. He then used After Effects to create an effect on the three-dimensional data. The final product did not look or move quite like a human and did appear androgynous, as I had hoped. Kirk and I experimented with this way of projecting for hours, seeing how different movements looked when altered and what would be interesting choreographically with these effects. Although the computer manipulations did not generate the choreography, it did inform the way that I would choreograph the dance for the virtual dancers. The quality of movement would be the inspiration for the dance. In the end, the virtual dancers had a more ethereal presence. I wanted them to be seductive and alluring. The pixilated quality I had found earlier using Danceforms and

Final Cut Pro was no longer detected in the virtual dancers, however, this movement was seen throughout the live dance. It seems as though the blending of the physical and non-physical had brought me to digitalizing the live dancer's movement and attempting to make the digital dancers more human.



Figure 6: Final version of virtual dancers using Microsoft Kinect.

The embodied choreographic process

In the year that I spent working on Danceforms and focusing on academics and theory, I found myself having less time to spend in movement oriented practices. I began to lose my own confidence and creative inspiration. I was becoming like the character in my story, wanting to find refuge from the technology I was working with and yet feeling isolated from the world. That summer, I took a break from school and focused on getting back into my body. That meant taking dance classes again. One of my teachers immediately noticed a change in me. She said I was no longer the dancer that she had admired only a year before. Had my technique and physicality changed so much? The real issue was my lack in confidence that came from being away from the embodied, dancing world for so long. However, I quickly began to feel confident in class again. By my second day back the teacher was yelling, “Yes, that’s the Chell I know.” The question was, how would I maintain this attitude when going back into the world of academia?

How would I collaborate my intellectual endeavors with my choreography? My final year, I set about to marry my computer world with my physical dance world.

To maintain my own mind body balance, I scheduled four important practices into my weekly routine. First, I began to take dance classes again three to five times a week. Second, I reinvested time in yoga. This practice would inform my choreography more than I could have imagined. Yoga was at the root of my own mind body balancing process and was the first thing I gravitated to in my choreographic process in the studio. I also began to practice Pilates, a physical conditioning routine originally created by Joseph Pilates in the early 1900's, biweekly. Combined with yoga, Pilates became the root of my choreographic process. I would begin in the studio with sun salutations or a repetitive Pilates exercise like the teaser. I would repeat these moves and allow them to build until I felt an impulse to move in a different way. This would become the choreography for section two of *Lilith*, where Lilith is trying to maintain her own mind body balance in a morning routine of yogalates (the combination of yoga and Pilates.) Lilith is constantly pulling away from her routine in this section by allowing physical impulses to generate movement which strays from her routine. There are video projections of the virtual dancers during this section also doing yogalates without straying from the daily routine to signify that computers are a part of this mind body centering process. Again, I was blending the lines of what was possible in the physical and the virtual world.

My fourth practice, long-distance running, would not inform my dancing as much as it would help me to maintain my own mind body balance throughout this process. By the time *Lilith* was performed, I was running an average of nine miles a day. For me, this embodied practice was necessary to feel connected to the world. Although running had no place on the stage in this process, the feeling I got when I went running was exactly

what Lilith was missing, what ended in her demise. After running again for a month my colleagues and mentors began to tell me that I was more focused than they had seen me in the past. Certainly this was in great part due to my personal growth due to experiences in the university, but running also aided in my abilities to focus and clarify what I was doing in academia. About twenty minutes into each run, I would begin to have an adrenaline rush and then all of my thoughts would slow down. I would begin to think about the process of creating *Lilith*, and what was important in that process. I would also come to realizations about what I wanted to happen in each section, how my research would inform and underpin my choreography, and what I needed to do to move forward. Most importantly, however, running helped me to stay calm when my team began to have technical difficulties. When the lights in my costume began to break, I went running and accepted that I could only do so much and would have to accept what I could not do. Through the extreme embodied practice of running, I was able to remain calm and balanced throughout this process.

Balancing the disembodied and embodied in performance

The biggest challenge in working with technology in live dance performance became apparent early on in my research. Not only had I created *Jane* which had both projections and live dance, but I choreographed a piece called *Torn* for the dance concert Ears, Eyes and Feet that was performed in the B Iden Payne Theatre at The University of Texas at Austin in May, 2011. The piece explored two dancers' experiences with injury and recovery. I decided to use the projection of an old video I had of an orthoscopic surgery that was done on my shoulder in 1994 when I tore the cartilage in my rotator cuff. *Torn* provided me with the opportunity to experiment with balancing the movement of a video projection with live dance. I took a still shot of the projection that played for the first several minutes of the piece. This picture looked like a moon which I

hoped that the audience would notice but not pay too much attention to it, seeing it as scenery. Then, I slowed the actual video down in Final Cut Pro until it was impossible to tell it was moving. At this point, the audience would notice some movement, but I hope the video would not draw too much attention as there were no quick movements or changes in the content. The video was completely black and white in these moments, also not drawing the attention of the viewer's eye. Half way through the piece I sped the video up until in a climactic moment a blue instrument enters the screen and moves rapidly. At this moment, the dancers were lying on the ground quite still. I was experimenting with how to manipulate what the audience looked at and when.

In my investigation of literature and my own experience as an audience member I have found that when the viewer sees something other than a live dancer, specifically something technology driven like projections or unusual lights, the eye of that viewer becomes distracted. For example, if one was to project the image of ocean waves crashing in the background, the audience member may not know whether to watch the waves to see what might happen, or watch the dancer moving on stage. If he is able to remain focused on the live dancer at all, he is still torn between the dancer and the waves, tracking his eyes back and forth between the two. He might watch only the motion of the waves for long periods of time, and only look away if the motion becomes predictable. My challenge in creating my dance performance, *Lilith*, would be to balance the power of the live dance and any digital elements that were created. This balance could also be reflective of the relationship between the physical and non-physical in the choreographic process. Certainly in a piece about computer technology there would have to be projected elements and technology. I would have to focus on this relationship and the balance of power within it from the beginning of my creative process.

The final dance solo performance

Section one of *Lilith* begins with Lilith waking up. The audience sees her sleeping on a raked bed that is formed to her body with Versa TUBE lighting along each side of her body. A Versa TUBE is a long tube that appears similar to a fluorescent light with neon lights that move through it. The tube utilizes LED technology and video projection to create moving light patterns through the tube. These Versa TUBE lighting elements informed my approach to the dance. I wanted the bed to function as a sort of alarm clock that the dancing body would react to. Not only did the dance need to react to the impulse of the lights, the quality of movement needed to reflect the movement of the lights. The question would come up several times in the rehearsal process, were the lights reacting to the movement or was the movement reacting to the lights? The initiation of the dance coming from the body or the lights was in a constant state of flux until finally it seemed that the body was a reaction to the technology.

The designer and lighting programmer of the bed, Eric Gazzillo and I discussed how the lights would appear like an alarm clock waking Lilith from her sleep in the very beginning of the process. I began choreographing by imagining a light was tapping or tickling me at my hand or foot. I would shake this hand or foot until I finally threw the limb away from my body and followed the impulse and moved my body to a new place. Gazzillo then programmed the lighting around those movements, attempting to shake when I shook, pulsing from one side of the bed to the other as I turned. In this way, we created a skeleton of what the dance would become. Later, however, I realized that the lights and my body did not seem to be connected, so I began to let the choreography develop into something slightly different. I began to watch the lights as they changed from cue to cue and allowed my body to react to them. I also allowed the aesthetic of the lights to change the quality of the movement for this section. For example, I originally

shook in moments, but this was not connected to the fluid movement of the lights, so I slowed my movement down and took any shaking out of the choreography. In the end, the choreography for section one was generated from a combination of physical impulses and reactions to the computer technology.

Section two begins as Lilith finally wakes up. She steps away from the bed as a light pulses across it and then seems to appear on her costume. For the piece, specialty lighting artist Eric Lara and costume designer Erin Chmela worked together to construct a costume with LED lights built into it. This was complicated, as the costume needed to be self sufficient, working on battery power and controlled by a dimmer offstage. A power source needed to be built into the costume. Also, the dance itself was quite athletic, with Lilith constantly slamming her body on the ground. Would the LED lights be able to stand this sort of impact? The answer, it turned out, was no. The costume lights refused to work correctly from the beginning. Although the costume lit up in the final performances, less than half of the lights actually still worked. In this instance, the technology seemed to be over powering the process. The stress of trying to make the technology work took over a bit of the creative process until I resigned myself to the idea that the costume would either work or not and I would have to live with it. I could not waste time in rehearsal focusing on this one element.

The choreography for section two came directly from my yoga and Pilates practices. Section two was originally written in a script I created before the rehearsal process had begun as Lilith doing her morning exercises, trying to maintain her body mind balance and her connection to the computer. In certain moments where Lilith struggled to maintain her individuality, she would step away and dance fluidly and then convulsively, as if she was trying to escape her world but was prevented from it through her attachment to the computers. Virtual dancers appear on the rear projection screen

behind her also doing yoga and Pilates (yogalates.) These virtual characters were meant to embody the computer world. They would be in harmony with Lilith until the moments when she would step outside the yogalates vocabulary. In those moments, the costume lighting would strobe and turn from blue to red as the virtual dancers would literally step out of themselves and stare at Lilith.

The most difficult task in this section was for the live dancer to not be overtaken by all of the lights and technology on stage. In this section I wanted the audience to pay more attention to the live dancing body than to the virtual dancers. There were many versions of the projected dancers; some were minimal and some were full of dozens of virtual bodies. In the end, I decided that it would be best to only have five virtual dancers who did the same thirty seconds of movement in a loop, repeated, over and over. There were only three moments when one of the virtual dancers would step outside of its' own body, becoming a sixth dancer, and stare at the live dancer. These were punctuated moments, but were short enough that the projections were not a distraction from the live dance.

Besides finding a visual balance between the live and virtual dancers, the other difficult task was in creating a connection between the two dancing worlds. I decided that Lilith would never look at the virtual dancers, but instead attempt to sense them with the back of her body. I had made all sorts of other attempts to create a relationship with the virtual dancers based on my experience with *Jane*. In *Jane*, I had projected virtual dancers on a ten foot wide piece of fabric that hung upstage center with space to dance on either side of it. The fabric framed the virtual dancers but created a space that the live dancer would avoid. I, the live dancer, looked at the virtual dancers often throughout *Jane*. This was limiting and had the effect of emphasizing the virtual dance above the live dance. For *Lilith* I decided that the virtual dancers would need to be projected on the

upstage rear projection screen and fill the space. I would then dance all through the space as well, so that there were no physical limitations for either the virtual or live dancers. In this way, we were able to appear in the same space, in hopes of creating a clearer and more balanced relationship. I also used some of the impulse driven movement form the studio to create the virtual dance and some of the computer-driven pixilated movement form my experience with Danceforms in the live dance which I hoped would help establish this relationship between worlds.

Section three was an experiment with the struggle between the body and the mind through the juxtaposition in quality of text and movement. The difficulty lay in how speaking the text would change the quality of dance and dancing would change the quality of the spoken word. In other words, it was difficult for me as performer to separate my movement from the way that I spoke the text. I wanted the body and the voice to have different aesthetics so that it would seem as if Lilith's body was trying to say something different from the text, her underlying truth. The story Lilith tells is a fairy tale about a princess who is told by computers to shut herself away from the world. *Lilith* is a story with a gruesome and moral warning, much like fairy tales of the past. The cautionary tale posits that if we allow ourselves to be consumed by technology, we may lose our connection to the corporeal. Lilith's text is a fairy tale with the same moral. An added element to this section was the computer manipulation of the voice to create distortion and sound texture. The audience could here Lilith speaking live, but there was a distortion that would echo after each word which would not sound human or intelligible. It wasn't until the final weeks of rehearsal that I decided to use bits of the text that were prerecorded in the first section of the piece, when Lilith is asleep on the bed. However, here the text would be whispered inaudibly so that the audience would not

know what was being said. I wanted to introduce text early in the performance so that it wouldn't be an abrupt change later and to foreshadow what was to come.

Section four was perhaps the most successful in integrating the computer in the choreographic process. Taylor Kirk and I did our first experiments with the Microsoft Kinect for this section. The Microsoft Kinect is a camera that uses infrared lights to capture the shape of a moving image and project a version of that image. Through a sequence of programs the image can be altered to take on various forms, both human and non-human. The section was to be about the virtual dancers calling to Lilith, trying to calm her and invite her back to the computer dominated world. We started by filming some movement and decided on an effect that would make the virtual dancers look not quite human, but human like. They were androgynous and seemed to emit rays of light from their sketched bodies. Once we decided on an effect, Kirk filmed a three minute section that I created using choreography I had made in *Danceforms*, manipulating a skeleton frame by frame with gestures that were twisted to appear as if something not quite human was attempting to offer a hug to Lilith. I took this virtual dance with me into the studio and choreographed a quintet that drew from the vocabulary but altered it to play with levels and inversions. The final result was an ethereal, fluid, virtual dance. In my final performance, Lilith walked slowly towards the virtual dancers as they performed the four and a half minute quintet. I knew I wanted this section to be focused on the projections, so I had Lilith watch the virtual dance while she slowly walked towards them. In this way, there was no question what the audience should be looking at; all eyes including Lilith's were on the virtual dance. In the second and last performance of *Lilith*, I was moved to tears in this section. I was overwhelmed by Lilith's moment of letting go of the corporeal and desiring to join the virtual. In this moment Lilith realized that there was no use in trying to stay embodied, her life had been overrun by technology. Section

four revealed that Lilith was not able to maintain the mind body balance and that the technology was overpowering her.

The final section of *Lilith* was left until all of the other sections were completed. I knew from the inception of the piece that I wanted Lilith to commit virtual suicide, plugging herself into the computer and disappearing into it somehow. I did not know what this would look or sound like. I had hoped that we could use the Microsoft Kinect live in performance to create live projections from my organic image and then project altered versions of this onto my body. Unfortunately, there were technical elements beyond our control that made this impossible. Instead, we prerecorded my body on the bed having convulsive fits as if being electrocuted. Kirk took this projection and created five distinct virtual dancing versions of the movement that were then projected onto my body in the performance. After walking towards the bed in section four, I reached for a plug, made out of foam tubing that was attached to the bed and appeared to insert it into my chest. The virtual dancers were projected on my body while I convulsed making it appear like Lilith was being electrocuted. In a final moment, the projections stopped and I lay in complete dark as a sixth virtual avatar appeared by itself, walking towards the bed and then out towards the body. In this eerie ending, Lilith had disappeared into the computer.

Chapter 4: Conclusions

In the beginning of my research I hoped to explore computer-driven versus impulse driven choreographic processes but eventually was drawn into using the computer to manipulate rather than to generate material. I was fascinated by the idea of working with a computer program that could generate new movement, which is one reason for my interest in Danceforms. I wondered if I could program a formula into the computer and have the computer choreograph the dance, but I was foolish in thinking this could be so simply accomplished. A process like this would be completely beyond my limited knowledge of computers and computer programming. I was far behind in my experience with computers when entering the university, and had to learn very quickly if I was to consider even using computer-mediated methods. I did learn how to work with several programs rather quickly, however, going from novice to expert within certain systems. As I became more familiar with Danceforms and Final Cut Pro, it became clearer to me that my interest in using computers throughout the choreographic process was due to the nature of embodied versus what I felt were disembodied practices. I was not as interested in the movement that working with computers could create as much as I was intrigued by what the experience of working choreographically without using the body would be. The computer-mediated choreographic experience turned out to be both alluring and maddening; taking focus away from my own embodied practices.

I spent hundreds of hours using the computer to manipulate my choreography, creating a disembodied virtual dancer. In this process I found a relationship between the physical and non-physical that could be full of tension but also held potential for new choreographic ideas and performance possibilities. I wanted to learn more about what a non-physical choreographic practice could mean and how I could disembody both the

choreographic process and the performance of the choreography. Bill T. Jones had struggled with the idea of disembodied the dancer in *After Ghostcatching*. I wanted to have firsthand experience at what this process could achieve, how to achieve it, and why Jones was so apprehensive about it. For me, it was a process that could reflect the experience of working with cyberspace and new technologies. Disembodying my image to create virtual dancers became a way for me to express my intuitions about the relevance of virtual technologies in our lives today. The disembodied versions of my image in *Lilith* were a caution to society about where the path might lead if we do not balance our virtual interests with our live embodied ones. This path could lead to isolation and an unbalanced mind and body.

I was never apprehensive about disembodied, as Jones was. As a young choreographer I had learned to bring various lenses to the choreographic process when I studied with Joe Goode in San Francisco. Goode had taught me to bring spoken word, live singing, and personal experience into the studio when exploring new works. For me, the computer-mediated methods brought in a new lens that was relevant to current audiences. However, balancing this lens with the dance became a key factor in creating *Lilith*. I had seen other choreographers use technology in their work as a novelty, a projection behind a dance that either draws attention away from the live dance or is not necessary to the performance. In my work, I strove to use the technology as part of the creative process and to be a part of the performed dance. I believe that computer-mediated methods hold the potential for being another lens to connect the audience to the work rather than functioning purely as a scenic element.

In *Lilith*, there were four lenses that created a sort of quartet, although the piece was a technically a dance solo with only one live dancer. Besides the live dancer, there was the virtual dance, the Versa TUBEs on the bed, and the LED lights in the costume. I

used each of these pieces in harmony with one another to create a dance that would reflect the ways that computer technology can be used throughout the choreographic process rather than only to present it, as scenic elements. As dancing artists and choreographers we must move forward in our own explorations with disembodied and embodied practices if we are to keep pace with the ever evolving, computer driven world. In these explorations it will be a mistake to view disembodied and technology driven methods as tools to showcase dance. Instead, these tools must be seen as art forms of their own, as a collaborative part of the dance. In this way we will be able to marry dance and technology and explore and create hybridized styles that move beyond our imaginations or physical limitations.

Virtual technologies can also be alluring because of the potential they hold for simplifying tasks. In our daily lives we can see how technologies have simplified things like shopping, making travel plans and arrangements, finding schools and applying for jobs. We might fantasize that computers could take care of all our lives' more trivial tasks so that we could have more time to spend relaxing and enjoying life. For more complicated tasks, however, technologies may not yet offer such ease. In the field of dance, simple choreographic technologies have not yet been made readily available or easily manageable for the average dancer or choreographer. One technology often leads to the need for or deeper understanding of another technology. Three dimensional-programs like Danceforms may be available, but the choreographer first needs to learn how to manipulate the program. Then she must find a way to make the final product appear three-dimensional if it will be projection on stage. The choreographer will likely need collaborators familiar with the program to run the projections in performance if she does not wish to be both choreographer and technician. My lack of computer programming skills was a disadvantage throughout the process of creating *Lilith*. This

revealed one of the tensional forces that lay in the space between the physical and non-physical in my choreographic process. The frustration I found in not being able to physically perform a task while working on computers was only relieved when I was able to reinvest time in my embodied practices.

When investigating technology as it relates to choreography I found it necessary as a dancer to maintain a physicalized practice so that the technology did not become overpowering in my own life. As dancers and choreographers we must acknowledge that though all people may not have a need for kinesthetic experiences, the dance community does have this need. We must strive to maintain our mind body connection through daily physical routines while working within any sort of disembodied practice. If we believe there is any truth in the theory of embodied cognition, then we must question whether something more than just our emotional balance may be challenged in exploring disembodied methods. We must consider what might be lost if we do not find embodied ways to balance our non-physical investigations.

As I move forward with my research and career, I will continue to investigate the physical and non-physical using technology as a tool. In November of 2012, I will travel to Lasierra, Spain where I have been invited to stay for two weeks as artist in residence to further research my investigation by a group called AZALA. AZALA is a cultural arts program that provides a creative space with lodging and dance studios in the heart of the Basque region of Spain. The group is dedicated to providing creative space to artists for research and performance. I will create a piece, called *Wanderlust* that will be the culmination of a two week investigation.

As technologies constantly evolve that have the ability to impact both our personal lives and artistic experiences, it is increasingly important to remember that a relationship exists between the mind and body, the physical and non-physical. Although

we may not completely understand this relationship our disembodied and embodied experiences are reflected on some level in our work, physicality and minds. As the lines between virtual and organic realities become more blurred, the fluid relationship between the two worlds can only become stronger. New lenses for dance in performance are found at the intersection of the embodied and disembodied. In order to keep pace with the world of technology and entertainment, we must continue to experiment with technologies that can influence, facilitate and manipulate our choreography. While working with these technologies, however, we must maintain embodied practices to keep our own bodies and lives well balanced. We are only beginning to see the possibilities with these technologies, both positive and negative, and the impact of experiencing art and the world through computer-mediated lenses.

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