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Translating Embodiment: A Look at Language and Cognition of Dance Performance from Studio to Stage

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TRANSLATING EMBODIMENT:

A LOOK AT LANGUAGE AND COGNITION OF DANCE PERFORMANCE

FROM STUDIO TO STAGE

BY

SAMANTHA EVE JOHNSON

A THESIS SUBMITTED TO THE DEPARTMENT OF DANCE OF THE COLLEGE AT BROCKPORT,
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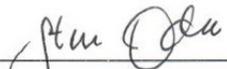
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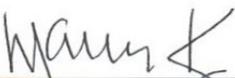
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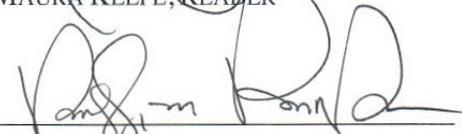
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**TRANSLATING EMBODIMENT: A LOOK AT LANGUAGE AND COGNITION OF DANCE
PERFORMANCE FROM STUDIO TO STAGE**

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INTRODUCTION:

“Computers are useless—all they can give you are answers.” –Pablo Picasso

Answers. We are constantly seeking them. Using them to identify an end point or sense of universal understanding. There are correct and incorrect answers. An incorrect answer confounds correctness. Definition of ‘answer’: a thing said, written, or done to deal with or as a reaction to a question, statement, or situation. Science, computers, and technology—all of these contemporary, progressive structures interwoven into our daily lives fuel this said definition; they identify answers with innate properties of physical understanding. Unarguably, these properties of understanding are essential to adequately perceiving the world around us.

“We cannot solve problems by using the same kind of thinking we used to create them.” –Albert Einstein

Problem Solving. Our culture is built upon a need to problem solve, to understand, to dig deeper into the reason ‘why’ or ‘how’ something works the way it does. Think of any question you have about the world around you. I bet you can find some sense of need for understanding and problem solving within it. Questions imply answers. Answers imply understanding.

There’s this famous ratio of signal to noise. Too much information and it turns into noise. You can only process so much. So to actually understand anything, you have to just keep tuning stuff out.” –Matthew Richie

Information. At its most fundamental, information is “any propagation of cause and effect within a system.”¹ This signal to noise ratio that Richie speaks of refers to a ratio of useful information to false or irrelevant data. According to cognitive scientists René Marois and Jason Ivanoff:

The human brain is heralded for its staggering complexity and processing capacity: its hundred billion (10^{11}) neurons and several hundred trillion synaptic connections can process and exchange prodigious amounts of information over a distributed neural network in the matter of milliseconds. Such massive parallel processing capacity permits our visual system to successfully decode complex images in 100 ms, and our brain to store upwards of 10^9 bits of information over our lifetime, more than 50 000 times the text contained in the US Library of Congress. Yet, for all our neurocomputational sophistication and processing power, we can barely attend to more than one object at a time, and we can hardly perform two tasks at once.²

Questions imply answers. Answers imply understanding. Understanding implies information. Information implies a bottleneck effect of, or limitation in power of, computational input processing. Brains, as primary motivators of our existence, are incredibly capable and fascinating creators of the world around us.

“The art of art, the glory of expression and the sunshine of the light of letters, is simplicity.” – Walt Whitman

However, I ask where art might fit into these ideas of correctness, understanding, information saturation, signal, noise, and sensation and perception? Specifically, where might dance, a wholly embodied physical art form, fit into our cognitively based need for reason and analysis? Where might body sit within its relationship to the active sensing brain? How might dance erode this definition of ‘answer’ and how might it elude a need for correct, universalized response?

¹ Vigo, Ronaldo. "Representational Information: A New General Notion and Measure of Information." *Information Sciences* 181, no. 21 (2011): 4847-4859.

² Marois, René, and Jason Ivanoff. "Capacity Limits of Information Processing in the Brain." *Trends in Cognitive Sciences* 9, no. 6 (2005): 296-305.

CHAPTER 1: THEORIES OF COGNITION

The purpose of this inquiry is to begin to connect phenomenological theories of embodiment with long-standing and emerging theories of cognitive science. Working closely alongside cognitive dance researcher Edward C. Warburton's claim that "the conjoinment of dance with enaction defines the knowledge domain and real-world context of dance action and performance,"³ I hope to bring scientific theory into the realm of embodied researcher.

From an ethnographic, embodied research perspective, the subsequent chapters of this project will explore notions of embodiment and translation within choreographic codes in contemporary Western concert dance. This research will be layered with a cognitive science lens—specifically looking at concepts of embodied cognition and dance enaction as they overlay studio and creative practice. I act as both participant and embodied researcher in the creative process of bringing two distinct solo works to life. For the purposes of this line of inquiry, I commissioned two internationally acclaimed, professional choreographers to act as sources of study. Each creative studio process (occurring independently as a dynamic process between choreographer and dancer/embodied researcher) has been documented with video recording, written reflection, language analysis, and interview. Through a combination of personal reflection, theoretical research, and embodied practice, I have assembled a body of inquiry that is both rich and diverse in form.

³ Warburton, Edward C. "Of Meanings and Movements: Re-Languaging Embodiment in Dance Phenomenology and Cognition." *Dance Research Journal* 43, no. 02 (2011): 67.

“Dances are not made but performed into existence,”⁴ says dance critic George Beiswanger in his 1973 address to the American Society of Aesthetics in Fairfield, Connecticut. What does it mean to ‘embody’ the choreographic codes of these professional choreographers with which I have worked? What mediates the translation of such specified and nuanced body languages from choreographer to performer? Furthermore, what cognitive forces are mediating the audience perception of what might be considered successful physical embodiment (on part of the performer) and successful understanding (on part of the viewer)? Ultimately, how might cognitive science notions of the “thinking body,” autopoiesis, appraisal and arousal, mirror neuron systems, and linguistic determinism play into answering the questions of corporeity and embodiment explored so exquisitely in dance creation and performance and what types of perceptual processing mechanisms might be at play?

As indicated by Warburton, there is a need to “assert a theoretical framework such as dance enaction that locates front and center dance content, cognition, and consciousness”⁵ in contemporary dance research. The variety of empathic responses possible when experiencing dance, making dance, and viewing dance is arguably what “distinguishes dance from other performing art forms.”⁶ In the subsequent chapters, I overlay cogent cognitive scientific theory on top of active studio performance research in hopes of bringing clarity to a highly dynamic, complex system of meaning-making situated within a kinesthetically-rooted, bodily art form.

⁴ George Beiswanger. "Doing and Viewing Dance: A Perspective for the Practice of Criticism," in *Dance Perspectives* 55 (Autumn 1973), 8.

⁵ Warburton, “Of Meanings and Movements,” 71.

⁶ Warburton, “Of Meanings and Movements,” 71.

Our world is made up of moving bodies. As 16th century French cleric and dance theorist Jehan Tabourot wrote in a treatise on Renaissance dance in 1589, “most of the authorities hold that dancing is a kind of mute rhetoric by which the orator without uttering a word can make himself understood by his movements.”⁷ In other words, every individual body carries within it a mute rhetoric—an ability to express and interpret meaning from other bodies by means of movement and interaction. However, might there be constraints of such a mute rhetoric as described by Tabourot? Might there be a delineation or layering of languages of the body, within this universal mute rhetoric, that limit our understanding of a specific movement ‘text’? “Any text that has slept with another text...has necessarily slept with all the texts the other text has slept with. However, for the orchestration of texts to have meaning, viewers must generally be familiar with the references, or the work’s appeal quickly becomes limited to an audience of insiders, leaving the average audience member at a loss to find meaning in what he or she is seeing.”⁸

To this, I respond with a few probing questions: (1) As a viewer, what does it mean to really understand or find meaning in a dance? (2) As a performer, where does the meaning lie in the work? And (3) What is the role of the kinesthetic, emotional, cognitive body in the translation of meaning between doing and (4) viewing bodies? Can such references as described above be kinesthetic or emotional, or do they have to be cognitively based in reason and analysis?

Dance writer and critic for *The New Yorker* since 1998, Joan Acocella argues that:

The truth of a dance is not found in the intellectual processes that have to do with what the artist is or is not trying to do. Dance, she says, is best seen as an orchestration of

⁷ Hagendoorn, Ivar. "Dance, language and the brain." *International Journal of Arts and Technology* 3, no. 2-3 (2010): 221-234, 221.

⁸ Van Dyke, “Vanishing: Dance Audiences in the Postmodern Age,” 217.

energies...the imaginative process by which a dance is made has a strong biological basis; there are patterns of flow that we respond to in our very bones.⁹

To narrow the scope of such a broad line of inquiry, I find myself engaged with the processes and mental faculties involved in the development of such ‘understanding’ on the part of performer, choreographer, and viewer. This project seeks to define and unravel some of these guiding cognitive principles behind processing ‘adequate understanding’ as it applies to the modern dance art form. In hopes of layering scientific research with active studio and embodied performance research, this project will be experiential in its form and analysis. However, let us start by chipping away at some of the cognitive science research behind the generalized need to “overintellectualize our capacity to evaluate and understand.”¹⁰

UNDERSTANDING EMBODIED COGNITION

According to cognitive scientist and embodied cognition philosopher Lawrence Shapiro, “embodied cognition is often presented as an alternative or challenger or ‘next step in the evolution of’ standard cognitive science.”¹¹ In contrasting the two research programs of standard cognitive science and embodied cognition, he says, the “domain of standard cognitive science is fairly clearly circumscribed (perception, memory, attention, language, problem solving). Its ontological commitments, that is, its commitments to various theoretical entities, are overt: cognition involves algorithmic processes upon symbolic representations.”¹²

⁹ Van Dyke, “Vanishing: Dance Audiences in the Postmodern Age,” 223.

¹⁰ Stewart, John Robert, Olivier Gapenne, and Ezequiel A. Di Paolo. *Enaction: Toward a New Paradigm for Cognitive Science*. MIT Press, 2010, 147.

¹¹ Shapiro, Lawrence. *Embodied Cognition*. Routledge, 2010, 1.

¹² Shapiro, “Embodied Cognition,” 2-3.

Embodied cognition, on the contrary, looks to understand and to define what it means “for cognition to be embodied.”¹³ Such an approach brings attention to the role of emotional and relational experience, in addition to the kinesthetic and algorithmic processes. Although a much less overt commitment to “cognition as computation over representations”¹⁴ (i.e., standard cognitive science), this developing field draws on many specialized fields of study including neuroscience, evolutionary theory, philosophy, and theories of categorization and phenomenology.¹⁵ Varela, Thompson, and Rosch, co-authors of *The Embodied Mind* (1991) and often considered the founders of the embodied cognition world, reject the traditional view of cognition as computation over representations, choosing instead to conceive of cognition as embodied action:

By using the term embodied, we mean to highlight two points: first, that cognition depends upon the kinds of experience that come from having a body with various sensorimotor capacities, and second, that these individual sensorimotor capacities are themselves embedded in a more encompassing biological, psychological, and cultural context. By using the term action, we mean to emphasize once again that sensory and motor processes, perception and action, are fundamentally inseparable in lived cognition (1991:173).¹⁶

Sensorimotor is an operative term here. In the same way that a microscope can (and is used primarily to) zoom closely on the physical attributes of a cell for instance, standard cognitive science can (and is used primarily to) zoom specifically on the computational properties of the brain and nervous system. However, this mechanism of analyzing a cell (i.e., the microscope) has limitations in that it only points to physical properties of the research site (i.e., the cell). It does not take into account a broader framework upon which the cell is interacting with surrounding cells, systems, and dynamic shifts in environment. Embodied cognition looks to build upon the standard model of cognitive science in the same way a

¹³ Shapiro, “Embodied Cognition,” 1.

¹⁴ Shapiro, “Embodied Cognition,” 28.

¹⁵ Shapiro, “Embodied Cognition,” 52.

¹⁶ Shapiro, “Embodied Cognition,” 52.

researcher might look to analyze the functional capacity of a cell within its dynamic living system. Zoom out. What does it mean to have a body? What role does that body play in the computational systems nestled within it?

To say that cognition is embodied means that it arises from bodily interactions with the world. From this point of view, cognition depends on the kinds of experiences that come from having a body with particular perceptual and motor capabilities that are inseparably linked and that together form the matrix within which reasoning, memory, emotion, language, and all other aspects of mental life are meshed.¹⁷

Varela, Thompson, and Rosch (subsequently referred to as VTR) present such a concept of ‘embodied action’ as a simplistic philosophical middle ground between realism and idealism—the chicken position and the egg position. However, before expanding further on such philosophical ideas of embodied action, I must first define a widely utilized concept in cognitive science called the ‘perception-action loop.’ According to VTR, “the contents of perception are determined (in part) by the actions an organism takes, and the actions an organism takes are guided by its perceptions of the world.”¹⁸ In essence, there is no way to fundamentally separate perception from action in the lived cognitive experiential model. “Perception leads to action, action leads to perception, and so on.”¹⁹

Now having acquainted ourselves with the perception-action loop and acknowledged the dynamic, cyclical interplay between perception and action, I can begin to address where VTR situate embodied action within the larger philosophical context of embodiment:

The chicken position: the world out there has pregiven properties. These exist prior to the image that is cast on the cognitive system, whose task is to recover them appropriately (whether through symbols or global subsymbolic states).

versus

¹⁷ Shapiro, “Embodied Cognition,” 56.

¹⁸ Shapiro, “Embodied Cognition,” 53.

¹⁹ Shapiro, “Embodied Cognition,” 53.

The egg position: the cognitive system projects its own world, and the apparent reality of this world is merely a reflection of internal laws of the system.²⁰

According to VTR, embodied action lies somewhere between these two positions of the chicken (realism) and the egg (idealism). VTR states:

Because cognition depends on sensorimotor capacities, which in turn reflect the nature of an organisms perceptual and bodily properties, the idea of a pre-given world is unsustainable. The world becomes “perceiver-dependent.” On the other hand, VTR wish also to reject the idealist view that the world is only apparent- a construction emerging from cognitive activity. The suggestion that sensorimotor capacities are “embedded” in a shared biological, psychological, and cultural context becomes significant in this context.²¹

THEORIES OF COGNITION: CLARK’S “THINKING WITH THE BODY”

“Cognition is embodied insofar as it emerges not from an intricately unfolding cognitive program, but from a dynamic dance in which body, perception, and world guide each other’s step.”²²

As noted earlier, research in embodied cognition spans several genres of inquiry across many multi-disciplinary fields of study. However philosopher Andy Clark succinctly describes a list of “distinguishing attributes of work in embodied cognition”²³ that I believe can help guide a simplified model of the science we are looking to understand and integrate into this particular paper. “The six ideas that Clark sees as characteristic of embodied cognition are intended to mark a shift away from thinking of the body as a mere container for the brain, or, slightly better, a contributor to the brains activities, and towards recognizing the body as the brain’s partner in the production of cognition.”²⁴ The six ideas are listed as follows:

²⁰ Shapiro, “Embodied Cognition,” 53-54.

²¹ Shapiro, “Embodied Cognition,” 54.

²² Shapiro, “Embodied Cognition,” 61.

²³ Shapiro, “Embodied Cognition,” 61.

²⁴ Shapiro, “Embodied Cognition,” 66.

Nontrivial Causal Spread, Principle of Ecological Assembly, Open Channel Perception, Information Self-Structuring, Perception as Sensorimotor Experience, and Dynamic-Computational Complementarity.

Nontrivial Causal Spread

A slinky's descent down a staircase is marvelous to watch. Despite lacking joints, gyros, and power sources, the slinky manages to take each step with what appears to be wary deliberation. It accomplishes the feat passively—leaving itself to the mercy of gravity, friction, and the tension of its own coils. Too much or too little gravity, friction, or tension, and the slinky's careful creeping will be foiled.²⁵

The slinky described here is a beautiful example of what proponents of embodied cognition define as nontrivial causal spread. If, for example, one were to compare the actions of the slinky to those of a robot designed to descend stairs, it seems that the slinky would still win out in terms of grace. The robot may have intricately programmed mechanisms (i.e., “servomotors, drive units, control units, gyroscopes, accelerators, foot sensors, batteries...”²⁶), yet as Shapiro notes, “[the slinky] exhibits a behavior we might have expected to be achieved by a certain well-demarcated system [which] turns out to involve the exploitation of more far-flung factors and forces.”²⁷ The delineation noted here is between sophisticated internal mechanisms (i.e., robot) and passive mechanisms inherent in both the structure itself and its surrounding forces (i.e., slinky). Does understanding the internal organization of a mechanism, no matter the complexity of the system, actually make that mechanism more aesthetically graceful or practically efficient? Internal organization systems and sophisticated understanding of processing mechanisms (as noted earlier) are essential for successfully building a robot that performs the given tasks that are required of it. However,

²⁵ Shapiro, “Embodied Cognition,” 62.

²⁶ Shapiro, “Embodied Cognition,” 62.

²⁷ Shapiro, “Embodied Cognition,” 62.

the slinky also performs those tasks (descending stairs), yet it utilizes elements inherent in its structure (i.e., coil tension) and its interaction with external forces (i.e., friction and gravity).

Looking ahead: How might this concept of nontrivial causal spread apply to the doing and viewing of the moving human body on stage? How might a choreographer communicate elements of material inherent in their own body to the performer? What elements of form are prominent in the studio process (i.e., organizational body systems and processing mechanisms or inherent body structures and emotions present in the performer)?

Principle of Ecological Assembly

The assumption in embodied cognition is that a cognizer tends to recruit, on the spot, whatever mix of problem solving resources will yield an acceptable result with a minimum effort. Problem solving...is a function of the resources an organism has available to it in its surrounding environment. This makes problem solving an ecological affair.²⁸

In other words, strategies used to perform a simple task are highly likely to differ depending on resources surrounding the task. Shapiro uses the example of reproducing a simple color tile pattern.²⁹ If participants are shown the example pattern for just a few seconds and then asked to reproduce the pattern in front of them, they are likely to use different cognitive strategies than if they were to have a template pattern available to reference the entire time. Problem solving involves engaging available resources for strategies that either fit or do not fit with simplifying or reducing abstract and difficult cognitive tasks.

Looking ahead: How does the Principle of Ecological Assembly apply to our understanding of dance content as both dancer and audience? If the natural human instinct is to use the

²⁸ Shapiro, "Embodied Cognition," 62-63.

²⁹ Shapiro, "Embodied Cognition," 63.

surrounding environment to solve the problem most simply, how might the cognitive task of finding meaning in movement be altered when transferred from one body to another?

Open Channel Perception

There is no need for complicated procedures of reckoning. As you move forward, just be sure that your target never flows, i.e. never appears to smear as would the portions of the optic array that are not directly in front of you. Perceptual systems, from the perspective of embodied cognition, are precisely tuned to exploit the sorts of invariances that Gibson sought to identify, thus forging computationally lavish mechanisms in favor of cheaper and more efficient alternatives.³⁰

Such a theory of navigating our surroundings has to do specifically with the “connection that the perceptual system bears to the world.”³¹ J. J. Gibson, ecological theorist of visual perception, proposes that as human beings, we are constantly monitoring our world around us—the “channel between the perceptual system and the world is constantly open.”³² Other theories of cognition might focus on building internal representations of the environment, plotting a course of action, and finally checking in with our environment periodically to be sure we are progressing adequately as expected. In this case, perception acts a secondary form of response to internal mechanisms independent of the changing surrounding environment. The Gibsonian model of perception instead favors a constant change in point of reference as the world changes around us—Gibson proposes perception as a dynamic and active process.³³

Looking ahead: What might I define as a point of reference in the creative studio process?

How might changing our perception (i.e., experience of the movement) with the world around

³⁰ Shapiro, “Embodied Cognition,” 63.

³¹ Shapiro, “Embodied Cognition,” 63.

³² Shapiro, “Embodied Cognition,” 63.

³³ Shapiro, “Embodied Cognition,” 63-64.

us (changing aesthetic choices of choreographer, changing locations in space, changing sound scores, etc.) alter how we view embodiment?

Information Self-structuring

Actions of the right sort can take some of the guesswork out of perception. If one thinks of perception as a process that generates hypotheses about the contents of the surrounding environment, the point of self-structuring information is to enhance the evidence available to this process; to enrich, or refine the evidence so that the burden on the perceptual system correspondingly lightens.³⁴

Shapiro provides a striking example of information self-structuring within the visual realm through the concept of *motion parallax*. Motion parallax provides a “very strong monocular cue of relative depth”³⁵ when viewing objects at any distance. Let’s look at a simple example. If one were to hold his/her finger out in front of his/her head at arm’s length and slowly turn the head to the right, what happens to the objects between his/her head and finger? What happens to those objects beyond his/her finger? Answer: those objects between the head and finger move in the opposite direction to which the head is moving and those object beyond the finger move in the same direction to which the head is moving. Why does this matter? It shows that “head movements are thus a means by which information is structured for purposes of depth perception.”³⁶ An organism’s way of moving and processing information is therefore dependent upon their morphology. Shapiro notes that different animals may use different actions to solicit the same information about depth perception. Interestingly, fun fact—pigeons bob their heads up and down to acquire depth information.³⁷

The physical embodiment of the organism and the cognitive mechanisms of processing information are incredibly relevant in understanding cognition because “the presence of an

³⁴ Shapiro, “Embodied Cognition,” 64.

³⁵ Shapiro, “Embodied Cognition,” 64.

³⁶ Shapiro, “Embodied Cognition,” 64.

³⁷ Shapiro, “Embodied Cognition,” 64.

active, self-controlled, sensing body allows an agent to create or elicit appropriate inputs, generating good data (Clark 2008: 21)³⁸ for cognitive processing.

Looking ahead: {Blank} are thus a means by which information is structured for purposes of {blank}. What might I use to fill in these blanks within the field of dance performance? How might structuring of information change depending upon the morphological and experiential components of the dancer?

Perception as Sensorimotor Experience

Philosopher Alva Noë and psychologist J. Kevin O'Regan have developed a theory of perceptual experience that identifies this experience with a kind of knowledge of sensorimotor dependencies. Experience with the world, Noë and O'Regan argue, leads one to acquire certain expectations about how one's movement will change one's experiences.³⁹

Of particular note here is the identification of the 'locus of perceptual experience.' Although ordinarily we think of the brain as the primary locus of perception, Noë and O'Regan's account of perceptual experience points to a more widespread locus of perception. An example of such can be seen in the movement of a person around a cube shaped object versus a spherical object. "As one moves around a cube...sides and corners that were once visible may no longer be so; previously invisible sides and edges come into view."⁴⁰ In contrast, as one moves around a spherical object, the perception of the object remains "invariant under transformation."⁴¹ It is important to note here that one's perception of the object they move around is dependent not only upon the shape (or nature) of the object, but also dependent upon the "qualities of the perceptual apparatus."⁴² In this case, the perceptual apparatus is the

³⁸ Shapiro, "Embodied Cognition," 65.

³⁹ Shapiro, "Embodied Cognition," 65.

⁴⁰ Shapiro, "Embodied Cognition," 65.

⁴¹ Shapiro, "Embodied Cognition," 65.

⁴² Shapiro, "Embodied Cognition," 65.

retinal surface of the moving individual. A “straight line will form a great arc on the retinal surface as one’s gaze shifts from the line to a point above or below the line.”⁴³

This is a complicated concept that I will not dig deeply into for the purposes of this paper. However it is interesting to note delineation between constitution and causation that such perceptual theory brings about in cognitive science: “the idea that bodily actions **constitute** perceptual experience or other mental states differs importantly from the idea that bodily actions influence or **cause** perceptual experience or other mental states.”⁴⁴

Looking ahead: What does a locus of perceptual experience outside of the “neural body” sit within dance performance? As a dancer? As a viewer? If actions constitute perceptual experience, where do mirror neurons and kinesthetic empathy come into play when understanding embodiment in dance?

Dynamic-Computational Complementarity

Despite his fervent defense of embodied cognition, Clark believes that there remains a role in cognitive science for more traditional explanatory concepts such as computation and representation...Clark’s position seems to be that cognitive science might retain this framework but would do well to focus its energies on understanding the extent to which body and world are factors in cognitive processes.⁴⁵

Simply put, Clark argues that the embodied cognition approach is an important layer in understanding cognition on a more global kinesthetic and representational scale. Furthermore, I argue that embodied cognition is a striking and creative way in to understanding and authorizing a more methodological question of what is meant by embodiment in dance performance.

⁴³ Shapiro, “Embodied Cognition,” 65.

⁴⁴ Shapiro, “Embodied Cognition,” 65-66.

⁴⁵ Shapiro, “Embodied Cognition,” 66.

THEORIES OF COGNITION: ENACTION

Defining Enaction

Enaction is a word derived from the verb to enact: “to start doing,” “to perform,” or “to act.”⁴⁶

As noted earlier, Varela, Thompson, and Rosch (VTR) present a concept of ‘embodied action’ as a simplistic philosophical middle ground between realism and idealism—the chicken position and the egg position. Cognitive scientist and emotion researcher Giovanna Colombetti describes the same VTR concept, in her case using the word enaction over embodied action, as an easing of “Cartesian anxieties”—“replacing the idea that cognitive systems represent an independent world with the idea that cognitive systems enact or bring forth their own worlds of significance.”⁴⁷ She argues that modern emotion science has a tendency to “overintellectualize our capacity to evaluate and understand.”⁴⁸ In such “over intellectualization” of what it means to understand or find meaning, Colombetti notes that we are rejecting the significance of the noneural body as a vehicle of meaning. As of current, emotion science is focused on “cognition [as] constantly preoccupied monitoring, evaluating and regulating the body, and with making sure that every action is performed out of (mental) reasons, not out of (bodily) passions,”⁴⁹ she says. This preoccupied state of understanding blinds many emotion science researchers to the meaning-generating role of the body and thus conceives of the body as a mere container whose role is only to “separate abstract cognitive-evaluative processes.”⁵⁰ With this state of understanding in mind, we now examine how we

⁴⁶ Warburton, Edward C. "Of Meanings and Movements: Re-Languaging Embodiment in Dance Phenomenology and Cognition." *Dance Research Journal* 43, no. 02 (2011): 65-84, 65.

⁴⁷ Colombetti, Giovanna. "Enaction, Sense-Making and Emotion." *Enaction: Toward a new paradigm for cognitive science* (2010): 145-164, 145.

⁴⁸ Colombetti, "Enaction, Sense-Making and Emotion," 147.

⁴⁹ Colombetti, "Enaction, Sense-Making and Emotion," 146.

⁵⁰ Colombetti, "Enaction, Sense-Making and Emotion," 146.

might allow the concepts of emotional perception and emotional response to be “conceptualized [wholly] as a faculty of the whole embodied and situated organism.”⁵¹

Autopoiesis

The term autopoiesis refers to a system “capable of reproducing and maintaining itself.”⁵² The original concept was developed by Chilean biologists Humberto Maturana and Francisco Varela in 1972—an attempt to define and explain the nature of autonomous living systems (specifically, the self-maintaining chemical mechanisms of living cells).⁵³ However, Colombetti notes a study by Weber and Varela (2002) in which autopoiesis is applied to living systems in a much more general sense. Weber and Varela state that “...living systems are autopoietic in the sense that (1) they continuously regenerate the conditions of their own survival and in doing so (2) they establish the boundary between themselves and the environment, and thus constitute themselves as unities.”⁵⁴ Furthermore, Weber and Varela state that both (1) and (2), when taken together, exhibit processes by which living systems establish a point of view, or “moreover, a concerned point of view that generates meaning.”⁵⁵

So what does this concept of autopoiesis have to do with generating meaning between moving, interacting, embodied humans? Simply, autopoiesis points to meaning generation rooted in the living system itself—“it is generated and at the same time consumed by the system...meaning is always relational in that sense that it depends on the specific mode of co-

⁵¹ Colombetti, “Enaction, Sense-Making and Emotion,” 146.

⁵² Colombetti, “Enaction, Sense-Making and Emotion,” 150.

⁵³ Maturana, Humberto R., and Francisco J. Varela. *Autopoiesis and cognition: The realization of the living*. Vol. 42. Springer Science & Business Media, 1991, 13.

⁵⁴ Colombetti, “Enaction, Sense-Making and Emotion,” 148.

⁵⁵ Colombetti, “Enaction, Sense-Making and Emotion,” 148.

determination, or coupling, that each system realizes with its environment.”⁵⁶ The environment is never a neutral environment—it is instead an environment made meaningful to the individual body through physical representation of, interaction with, and evaluation of the dynamic living system and its surroundings.

As Colombetti notes, the body itself therefore has a prominent role in the generation of meaning making—on both the macro (autopoietic) scale and on and micro (cellular) scale. “The body plays a role in cognition also thanks to its chemical and self-regulatory dimension,”⁵⁷ says Colombetti. For instance, *metabolism*, characterized by a set of “life-sustaining chemical transformations”⁵⁸ that allow the body to find homeostasis, is a significant component of sensory processing outside of the brain’s control center. Those involuntary, uncontrollable mechanisms by which the body maintains homeostatic structure at the cellular level are part of what scientists refer to as the autonomic nervous system. For the purposes of this paper, I do not expand upon the delineations and complications of the autonomic nervous system (including the sympathetic and parasympathetic nervous system). I do however note such dynamic presence of “involuntary” chemical reactions and electrical signals that work to maintain the stability of the human body’s internal environment in response to changes in external conditions. Those cellular adaptive capabilities of the body, i.e., metabolism, are thereby “necessary for the emergence of values and preferences in living systems.”⁵⁹

⁵⁶ Colombetti, “Enaction, Sense-Making and Emotion,” 148.

⁵⁷ Colombetti, “Enaction, Sense-Making and Emotion,” 150.

⁵⁸ Mandrup, Susanne. “Lessons Learned from Systems Approaches to Metabolism.” *Trends in Endocrinology and Metabolism: TEM* 26, no. 12 (2015): 669-670.

⁵⁹ Colombetti, “Enaction, Sense-Making and Emotion,” 150.

Appraisal and Arousal

Appraisal, within the realm of cognitive science, refers to the process that “evaluates and understands the environment, and that ultimately brings about specific emotions.”⁶⁰ Bodily *arousal* is often thought of as a response to appraisal that does not “exert any causal power on it—it is a by-product of appraisal.”⁶¹ American psychologist Magda Arnold introduced the notion of appraisal within cognitive science in 1960 as a reaction to emotion theories of her time, most of which ignored the role of the individualized, physiological body in emotion and feeling.⁶² Arnold was interested in the relationship between stimulus detection and emotional response. Stimulus detection, as defined within the discipline of cognitive psychology in the 1950’s, “assumes that the decision maker is not a passive receiver of information, but an active decision-maker who makes difficult perceptual judgments under conditions of uncertainty.”⁶³ Arnold expands upon this concept in her appraisal theory, pointing to the bi-directional power of bodily arousal in stimulus detection. Active decision-making involves an unconscious physical response to conditions of uncertainty, and thereby must “account for individual variances to emotional reactions to the same event.”⁶⁴

American philosopher, psychologist, and mid-late nineteenth century physician, William James, is famous for stating the following: “a purely disembodied human emotion is a nonentity; if you imagine an emotion without its bodily symptoms, you will be left with some cold-blooded and dispassionate judicial sentence, confined entirely to the intellectual

⁶⁰ Colombetti, “Enaction, Sense-Making and Emotion,” 151.

⁶¹ Colombetti, “Enaction, Sense-Making and Emotion,” 151.

⁶² Scherer, K. R., & Shorr, A., & Johnstone, T. (Ed.). (2001). *Appraisal Processes in Emotion: Theory, Methods, Research*. Canary, NC: Oxford University Press: 21.

⁶³ Peterson, W. W., Birdsall, T. G. & Fox, W. C. *The Theory of Signal Detectability. Proceedings of the IRE Professional Group on Information Theory*, 1954, 171-212.

⁶⁴ Smith, Craig A. & Lazarus, Richard S. (1990). Chapter 23. Emotion and Adaptation. In L.A. Pervin (Ed.). *Handbook of Personality: Theory and Research*. New York: Guilford, 609-637.

realm.”⁶⁵ Colombetti connects this rather dated, yet packed and presently relevant statement, with what she now defines as corporeal impersonalism. Corporeal impersonalism can be characterized by the “assumption that the noneural body does not contribute to subjective, personal understanding—in short, is not a vehicle of moving.”⁶⁶ Corporeal impersonalism implies separation between bodily arousal and cognitive appraisal.

However, appraisal and arousal research has shown that the nonneural body does in fact contribute to an emotional and kinesthetic formulation of meaning within the body. Examples of such research can be found in studies that specifically look at the dynamic correlation and integrated connection of appraisal and arousal—the bi-directional interplay between the two. Studies have shown that “uninterpreted arousal (arousal for which subjects do not have an explanation) is not meaningless or experienced as emotionally neutral.”⁶⁷ Such results allude to an integrated system of body and mind; emotions are not always understood even though they may be experienced physically. In fact, physical arousal seems to exist even with no apparent conscious appraisal of a non-neutral circumstance or environmental stimulus.⁶⁸ With these ideas in mind, we can assume that meaning is appraised through means of being embodied and situated within a physical body. The experience of emotion occurs through the state of that physical body (in addition to the thinking body, i.e., appraising body). Therefore appraisal does not result in arousal. Instead, arousal is integrated within the process of appraisal and thereby comprises a significant portion of generating meaning and understanding of the world around us.

⁶⁵ Colombetti, “Enaction, Sense-Making and Emotion,” 152.

⁶⁶ Colombetti, “Enaction, Sense-Making and Emotion,” 153.

⁶⁷ Colombetti, “Enaction, Sense-Making and Emotion,” 154.

⁶⁸ Colombetti, “Enaction, Sense-Making and Emotion,” 154.

Lastly, I note the presence of anatomical structures in the brain that work simultaneously in both the processes of appraisal and arousal. The amygdala, for instance, “plays a dual role in appraisal and arousal; the anterior cingulate cortex is involved in planning, attentional orientation, and emotion experience; bodily arousal (autonomic and endocrine activity) maintains the organisms homeostatic equilibrium, contributes to emotion experience, enhances attention, and prepares for action.”⁶⁹ The power of one such structure is difficult to grasp fully (for the purposes of this paper, we will leave this be). Yet, such complexity in structure and function points to a reciprocally constraining process of positive and negative feedback that collectively produce an integrated understanding of our world through the brain, the body, and the environment.

KINESTHETIC EMPATHY: ACTION OBSERVATION AND SIMULATION CIRCUITS

Mirror Neurons

Mirror neurons are specialized neurons that are activated both when performing and observing an action. For instance, the regions of the brain implicated in the mirror neuron system (see below) will present similar neural activity patterns both when an individual is grasping for a ball and when that same individual observes another person grasping for a ball. In essence, the neuron “mirrors” the motor behavior of the other individual, as if the motor behavior is being executed by the observer himself. Mirror neurons are believed to be essential for mediating and understanding behavior action and intentionality. Mirror neurons are also implicated in fields of study surrounding emotional connectivity, empathy, and neurological disorders.

⁶⁹ Colombetti, “Enaction, Sense-Making and Emotion,” 157.

Mirror Neuron System (MNS)

The main areas of the brain implicated in the mirror neuron system are the ventral premotor cortex, the supplementary motor area (anterior to the primary motor cortex), the superior temporal sulcus (STS), the primary somatosensory cortex (postcentral gyrus) and the inferior parietal lobule (IPL). The supplementary motor area (SMA) and the premotor area make up what is called Area 6 of the cortex, which runs rostral to Area 4, the primary motor cortex (M1). Many studies (Rajmohan and Mohandas 2007, Nelissen et al. 2011, Cross et al. 2005) have looked to the neural projections of the *mirror neuron system* (MNS) in hopes of better understanding action observation and embodiment of action.

Nelissen et al.⁷⁰ used functional magnetic resonance imaging (fMRI) to map brain activity of macaque monkeys when observing grasping actions of other individuals. Two areas of the brain that are most densely packed with mirror neurons, ventral premotor cortex (area F5 in macaques) and superior temporal sulcus, have no known direct anatomical connection to one another. The aim of this study was to investigate the anatomical link between these two regions and begin to understand the functional anatomy of the mirror neuron system in more detailed form. Nelissen et al. also looked to map cortical areas involved in visual analysis of observed action versus intentionality. An example of such distinction between action observation and intentionality can be found in a simple grasping task. The type of grasping observed can be defined as the action observation. *How* the grasped object will subsequently be used, however, can be defined as the intentionality behind the action. These actions are mapped differently within the cortex. This study found two functional routes, packed with

⁷⁰ Nelissen, K., Borra, E., Gerbella, M., Rozzi, S., Luppino, G., Vanduffel, W., ... & Orban, G. A. (2011). Action observation circuits in the macaque monkey cortex. *The Journal of Neuroscience*, 31(10), 3743-3756.

mirror neurons, that link area F5 (ventral premotor cortex) with the superior temporal sulcus. These routes act via the inferior parietal lobe (IPL).⁷¹

The following offers a simplified diagram of the Mirror Neuron System (MNS):

Sensory Input → Superior Temporal Sulcus (STS) → Inferior Parietal Lobule (IPL) → Ventral Premotor Cortex → Primary Motor Cortex (M1)

The two defined routes linking the premotor cortex with the superior temporal sulcus act via the anterior intraparietal sulcus (AIP) and the inferior parietal lobe (PFG). Both AIP and PFG have extensive anatomical connections with area F5 of the macaque. “These functional routes are a subset of anatomical connections that link the ventral premotor cortex, posterior parietal cortex, and STS.”⁷² A significant finding of this study was the brain activation dependency on object versus agent acting upon the object. It became apparent that the AIP route was more active in response to the object itself and therefore can be implicated in the understanding of goal-related acts. Alternately, the PFG route was more active in response to the agent acting upon the object. Therefore, the PFG route may have more significance in extracting intention of motor acts. The study of intentionality and cognitive effects of mirroring is still a relatively new topic of interest, however, the relevance of mirror neurons and the mirror neuron system is vast. Current research points to the implication of mirror neurons in imitation, empathy, intersubjectivity, emotional attunement, and social cognition.

⁷¹ Nelissen et. al., “Action observation circuits,” 2011.

⁷² Nelissen et. al., “Action observation circuits,” 2011.

Experiential Influence Upon Action Observation and the Mirror Neuron System

While the mirror neuron system has been studied extensively in regards to performing simple overlearned actions, the translation of such studies to complex, integrated movement (such as movement we are accustomed to in the dance studio) leaves much to be considered. As examined above, specific areas of the brain have been identified with localized clusters of mirror neurons that actively respond to movement when both performing and observing a movement. The question that follows is whether such brain activity in localized areas of the mirror neuron system can be applied to integrated motor patterns, not simply grasping tasks. Additionally, as Cross et al. explore in their 2006 study of action observation of dance by dancers themselves⁷³, does experience with movement and action patterns alter brain activity within the mirror neuron system? Does embodied experience of movement alter brain activity when watching someone else perform that same movement? Does the physical embodiment and experience with action sequence increase ones ability to visualize and perceive their own body doing such movement? Finally, does seeing ones *own* body, as opposed to another body, perform actions alter how the mirror neuron system responds to viewing movement sequences?

Cross et al. hypothesize the presence of an '*action simulation circuit*.' Action simulation is defined as the internal representation of motor programs without overt movement⁷⁴; simply put, imagining the self in performance of a movement. The action simulation circuit, then, includes five areas of the brain: anterior rostral supplementary motor area (SMAr), ventral premotor cortex (PMv), inferior parietal lobule (IPL), superior temporal sulcus (STS), and the

⁷³ Cross, E. S., Hamilton, A. F. D. C., & Grafton, S. T. (2006). Building a Motor Simulation De Novo: Observation of Dance by Dancers. *NeuroImage*, 31(3), 1257-1267.

⁷⁴ Jeannerod, M. (2001). Neural Simulation of Action: A Unifying Mechanism for Motor Cognition. *NeuroImage*, 14(1), S103-S109.

primary motor cortex (M1).⁷⁵ Note that this action simulation circuit involves most all of the same areas as defined earlier in the mirror neuron system. Mirror neurons are at the root of all action observation, simulation, and embodiment and therefore it is no surprise that all of these circuits involve the same localized areas of the brain. The goal of this specific study was to observe the impact of embodiment on action simulation in dancers. Dancers were taught several phrases and then shown videos of movement. Some movements were familiar, practiced movement to the participants and others had never been seen or rehearsed before. Researchers found that STS, PMv, IPS, and SMAr showed more pronounced activity when dancers had been exposed to the movement in rehearsal before simulating the action during testing. This result points to the significance of embodiment on the mirror neuron system.

Simple tasks such as grasping are defined as overlearned, familiar tasks. Humans are constantly exposed to grasping in everyday life. Complex, integrated movement phrases, on the other hand, are not overlearned tasks. Mapping neural activity within the action simulation circuit of novel movement phrases alludes to the innate plasticity of neural response mechanisms in response to learning new movement phrases. If neural activity is directly correlated to the physical embodiment of a particular action or sequence of actions, what does this say about the mirror neuron system and how it may impact our understanding of doing and viewing dance performance?

“Dance, although it has a visual component, is fundamentally a kinesthetic art whose apperception is grounded not just in the eye but in the entire body”⁷⁶
–Ann Daly

⁷⁵ Cross et. al., “Building a Motor Simulation,” 2006.

⁷⁶ Daly, Ann. "Shared Distance." *Dance Research Journal* 34, no. 2 (2002): 97-99.

Linguistic Determinism

“Language shapes the way we think, and determines what we can think about,”⁷⁷ says linguist Benjamin Whorf (1956). Language also has a clear role in our understanding of the world around us. Cognitive scientist Lera Boroditsky takes this idea a step further into the scientific realm by asking “whether language might selectively bias cognition, causing one to reason about or represent particular domains in a way that would differ were one’s language to differ.”⁷⁸ With Boroditsky’s idea of selectively biased cognition in mind, let us now look at a concept brought forth by Shapiro, the BACHELOR *concept*, that I feel adequately delineates between concept and conception in regards to simple and specified language. Ironical that “concept” is herein used to describe the explicated idea moving forwards...

Bachelor (concept): applies to all and only unmarried men

Bachelor (conceptions): Examples

1. Bachelors are sexually aggressive
2. Bachelors are lonely souls who need to find a good woman

Yet, according to the above delineation, does the term “concept” feel all encompassing? As Shapiro notes, the “chance that any two individuals ever share the same concept is terribly unlikely...no two of us share exactly the same thoughts about anything.”⁷⁹ However, despite differences in conceptions of an idea, we can usually agree upon a concept: i.e., bachelors are unmarried men, triangles have three sides, etc. We judge those who disagree with such as having “defective concepts, rather than simply different concepts.”⁸⁰

⁷⁷ Shapiro, “Embodied Cognition,” 72.

⁷⁸ Shapiro, “Embodied Cognition,” 72.

⁷⁹ Shapiro, “Embodied Cognition,” 77.

⁸⁰ Shapiro, “Embodied Cognition,” 77.

I wonder if language surrounding our conceptions of the world might stifle the innate breadth of cognitive, kinesthetic, and emotional understandings we have situated in our bodies. Do such ‘defective concepts’ formulated within a specified language, be it verbal or nonverbal, hold us back from trusting our ability to appraise our understanding at the level of both mind and body?

APPLIED MODELS OF UNDERSTANDING EMBODIED COGNITION

Phenomenology of Embodiment Theory

Phenomenology is broadly defined as “ a philosophical argument for the foundational role that perception plays in understanding and engaging with the world.”⁸¹ Dance scholarship, specifically, has drawn heavily upon the research of French philosopher Maurice Merleau-Ponty regarding the phenomenology of perception (1962) and structure of behavior (1963). Merleau-Ponty has been recognized by dance researchers as a progressive contributor to dance studies due to his insight surrounding topics of corporeity. Of particular interest to dance scholarship is his theory of the phenomenology of embodiment— which “makes the physical being the site of the psyche:”

The body is our general medium for having a world. Sometimes it is restricted to the actions necessary for the conservation of life, and accordingly it posits around us a biological world; at other times, elaborating upon these primary actions and moving from their literal to a figurative meaning, it manifests through them a core of new significance: this is true of motor habits such as dancing. Sometimes, finally, the meaning aimed at cannot be achieved by the body’s natural means; it must build itself an instrument, and it projects thereby around itself a cultural world (Merleau-Ponty, *Phenomenology of Perception*, 146).⁸²

⁸¹ Warburton, Edward C. "Of Meanings and Movements: Re-Languaging Embodiment in Dance Phenomenology and Cognition." *Dance Research Journal* 43, no. 02 (2011): 65-84, 65.

⁸² Warburton, "Of Meanings and Movements," 66.

In accepting this definition of meaning making and cognitive world building, we are accepting the generalized embodiment thesis, which alludes to “mental activity depend[ent] essentially not just on the brain but on the body as well.”⁸³

Direct Applications of Inter-Disciplinary Research

Cynthia Freeland, a philosophy researcher and professor at University of Houston, writes the following in regards to the active merging of art and cognitive science disciplines into forms of study:

Cognitive science is revolutionizing our understanding of ourselves by providing new accounts of human rationality and consciousness, perceptions, emotions, and desires, with great consequences for our understanding of the creation, interpretation and appreciation of artworks in all mediums.⁸⁴

Freeland is conceptualizing a form of inter-disciplinary study that would look to understand art theory and perception at the cognitive level as opposed to the mechanistic level. Creative *process mechanisms* tend to be more quantitative in nature than *performance and embodiment mechanisms*. Quantifiable tasks and resultant changes in outcome in the creative process are traceable. Therefore, creative task based research can align closer with a standard scientific methodological approach. However it seems nearly implausible that we might attempt to understand an interpretive and qualitative field of performance art and ‘embodiment’ through such a standard scientific lens. Such frameworks of study call for isolation of variables and quantifiable results—certainly not applicable in this newer, bi-directional, interdependent concept of embodied cognition.

⁸³ Warburton, “Of Meanings and Movements,” 66.

⁸⁴ delahunta, Scott, Phil Barnard, and Wayne McGregor. "Augmenting Choreography: Insights and Inspiration from Science." *Contemporary Choreography: A Critical Reader* (2009): 431-448.

Neuroaesthetics, a new line of research emerging in cognitive science, attempts “to explain some aspects of the perception of art on the basis of scientific study of the brain.”⁸⁵ I align this research project with the neuroaesthetic approach in that it applies scientific models and theories (as explicated earlier) to understanding both perception and embodiment of the dance performance art form.

⁸⁵ deLahunta et. al., “Augmenting Choreography,” 2009.

CHAPTER 2: CASE STUDY [ORI FLOMIN]

The first time I watched Ori Flomin’s work, the beauty paralyzed me. As I sprawled my tired, graduate school-worn body over my basement apartment floor and stared at my computer screen, I couldn’t help but ogle over the sweeping masses, the soft lines, the vigorous athleticism. I knew next to nothing about this professional artist, yet for some reason I couldn’t stop watching. It wasn’t logic, it was a visceral impulse—I simply *had* to ask him to be a part of my embodied research project. His artist biography reads as follows:

Ori Flomin’s choreography has been presented in New York at Gibney Dance, Dance Theater Workshop, PS122, Movement Research at Judson Church, DanceMopolitan at Joe’s Pub, and Dance New Amsterdam as well as internationally at venues in Austria, Japan, Norway, and Israel. He created commissioned work for Purchase Dance Company (2013), The Barnard Project at Dance Theater Workshop (2005 and 2010), The New School (2011), and The Dance School of Norway, (2009, 2011). He was a 2004 Movement Research Artist-in-Residence and 2003 Dance Space Center Artist-in-Residence. In January 2015 he premiered a collaborative duet with Swedish Choreographer Helena Franzen at Dansmuseet, Stockholm.

Ori served as assistant to the Artistic Director of Stephen Petronio Dance Company, for which he also danced from 1991-1999, and for whom he continues to set work internationally. He also had the pleasure of dancing with Neil Greenberg, Molissa Fenley, Maria Hassabi, Kevin Wynn and Michael Clark among others. Ori currently teaches at NYU and is on faculty at Movement Research and Gibney Dance Center. He has been a guest faculty member for Princeton University, The New School, SUNY Purchase, Barnard College and Rutgers College in the USA and internationally for many companies and schools such as ImpulsTanz (Vienna), P.A.R.T.S.(Brussels), Sasha Waltz Company (Berlin), Culberg Ballet (Stockholm), SEAD (Salzburg), London Contemporary School of Dance (London), Ballet de Lorraine (Nancy) and many more.⁸⁶

⁸⁶ Flomin, Ori. Artist Biography.

TIMELINE AND PROCESS

I first communicated with Flomin back in February of 2015. After some back and forth introductions, he asked that I send him some videos of me dancing, which of course I did, and he graciously responded, “Yes, I like what I see and I will say, sure let’s do it!”⁸⁷ As I was beyond thrilled that my hopes of working with this artist were coming to fruition, I continued to watch, read, and research his work, his background, his life journey. We continued planning and decided it would be best for me to head to New York City, take class from Flomin a few times, and get to know one another both inside and outside of the studio. In July of 2015, we did just that.

“In the same way that you want to see where my work takes you, I want to see where you take my work. It is going to be an immersive, collaborative process,” said Flomin as we sat at Starbucks on the corner of Broadway and Reade Street. In November of 2015, this immersive, collaborative process began. Two days, 5 hours/day. A weekend overflowing with generated and learned material; a weekend of kinesthetic and emotional overload. Undoubtedly, this particular weekend was a dense and complex study of a unique and physically determined “relational mode”⁸⁸ of generating meaning.

As I allude to in Chapter 1, “every individual body carries within it a mute rhetoric.”⁸⁹ My studio experience with Flomin exemplifies mute rhetoric not only in lack of vocal cueing, but also in thorough emotional and sensational cueing. Let me dig in to what exactly I mean by this.

⁸⁷ Flomin, Ori. E-mail correspondence with Samantha E. Johnson. April 2015.

⁸⁸ Warburton, Edward C. "Of Meanings and Movements: Re-Languaging Embodiment in Dance Phenomenology and Cognition." *Dance Research Journal* 43, no. 02 (2011): 65-84, 69.

⁸⁹ Hagendoorn, Ivar. "Dance, language and the brain." *International Journal of Arts and Technology* 3, no. 2-3 (2010): 221-234, 221.

Our first day of rehearsals at New York University back in November of 2015 involved what I can most simply explain as a game of follow the leader. Flomin would articulate a series of movements with his body, and I would follow along as he kept repeating and building upon the phrase. We spent about 2 hours doing just this. However, it took me several minutes to understand that this was how we were going to communicate in the studio. This understanding came not from vocal explanation of a “plan,” but instead from a perceived set of unspoken rules set by Flomin. It certainly did not take long for me to adapt to the given construct of how we were going to go about learning new material, however it took emotional and kinesthetic adjustment for me as a student/learner/researcher. What was I supposed to focus on in his body? Was he looking for specificity in line, shape, and effort, or was he looking for a generalized approach to a set of moves that are variable when taken on by another body? I wasn’t sure how he wanted me to read his specified ‘text.’

Spoken language brings sense to what we do. Without spoken identifiers utilized in the studio for me to locate and process through his movement material, I experienced an immediate sense of well, no sense. It all just looked foreign—where was I supposed to start? Already anxious about the process of both working with and living up to the high standards of Flomin’s work, I just stared following on autopilot. Flomin moves arm to the upper right, I move arm to the upper right. Flomin slides to the floor, I slide to the floor. I immediately clung to movement references that were familiar in my kinesthetic movement vocabulary—level, sense of weight, direction, position, linearity, verticality. As a trained dancer, I can confidently say that I am familiar with the said ‘references’ of dance making and performing. I understand level, time, direction change, tempo, phrasing, effort—but I understand such elements as they manifest in my own body. I experience these references on a daily basis,

whether it is in a studio, in a dance research seminar, or simply in just discussing movement and the body over coffee with friends. This structure of understanding such ‘references’ is woven into my physical, emotional, and cognitive matrix. Yet somehow despite my familiarity with these physically rooted references, I still couldn’t grasp the specified tonality, nuance, and accent of the language being communicated.

Although immediately overwhelmed by the amount of movement material being rapidly communicated, I did not disconnect or feel at a loss of understanding. The language, though foreign, felt tangible. My immediate question looking back upon this experience is *why* and *how* could something feel so foreign yet understandable in my body? What is it that distinguishes connection from understanding? Shapiro notes that “Cognition depends on the kinds of experiences that come from having a body with particular perceptual and motor capabilities that are inseparably linked and that together form the matrix within which reasoning, memory, emotion, language, and all other aspects of mental life are meshed.”⁹⁰ Simply put, Flomin and I have very different cognitive matrices made up by differing body histories, experiences, memories, languages, and capabilities...

Ori Flomin is 48 years old and grew up in Israel. He is in love with “the feeling of beginning each new day, the potential...” and enjoys the tastes of “any pastry in Paris.” He is terrified of “losing loved ones and not being able to control [his] own body.” He spends at least 3-6 months of every year in Europe, often Scandinavia, and lives his life with “continuous curiosity.”⁹¹

⁹⁰ Shapiro, Lawrence. *Embodied Cognition*. Routledge, 2010, 52.

⁹¹ Flomin, Ori. Interviewed by Samantha E. Johnson. Research guided interview. New York University Studios, November 2015.

Samantha Johnson is 26 years old and grew up in a small coastal town just south of San Francisco, California. She is in love with “the changing seasons, laughing, vanilla chai, sweatpants, sloths, pathetically romantic movies, playing in the rain, cozy socks, adventure, the feeling of love, reading, writing about absolutely nothing that feels relevant, and being present every second of [her] life.” She enjoys the tastes of “coffee ice cream, peppermint *anything*, sushi, any and all forms of chocolate, cheese, and salt (including the taste of fresh beach air)...”⁹² She is terrified of olives, snakes, and driving over bridges over water, and spends 11.5 months out of her year settled in Rochester, NY engaged as a graduate student and young professional artist.

Note some differences? Our physical arrival together into the NYU studios in November 2015, though complex in its own nature of logistical set up, was much more complex at the level of cognitive, emotional, and kinesthetic body relationships. “Cognition is embodied insofar as it emerges not from an intricately unfolding cognitive program, but from a dynamic dance in which body, perception, and world guide each other’s step.”⁹³ This particular weekend exemplifies a coming together of two embodied researchers, with body stories spanning the physical globe (space), age (time), and cognitive “perceiver dependent”⁹⁴ experiences.

As I look forward at how cognitive science principles overlay this complex studio process spanning from Summer 2015 to Spring 2016, I cannot ignore the sense of embodiment and personhood that makes up each of our bodies in the space. I cannot ignore that Flomin enjoys

⁹² Johnson, Samantha. *Translating Embodiment: A Look at Language and Cognition of Dance Performance from Studio to Stage*. Wordpress, May 2015, www.versatileartistry.me.

⁹³ Shapiro, “Embodied Cognition,” 61.

⁹⁴ Shapiro, “Embodied Cognition,” 54.

the tastes of “any pastry in Paris” because he frequents there often, and Sam knows nothing of the real tastes of French pastries (other than the American take on them). Flomin and Sam form a unique matrix of body history, meaning-making, and physical understanding. As I begin to apply philosopher Andy Clark’s “attributes of work on embodied cognition”⁹⁵ to this unique creative setting, might I begin to unveil how the physical body itself holds such power in generating meaning? How two bodies can be so foreign and so understood at the exact same time?

NONTRIVIAL CAUSAL SPREAD [STUDIO VERSION]

A [**dancer plunging into new, foreign movement material**] is marvelous to watch. Despite lacking [**kinesthetic memory of sequenced actions and movement sources**] the [**dancer**] manages to take each step with what appears to be wary deliberation. It accomplishes the feat passively—leaving itself to the mercy of [**inherent physical understanding and interpretation**]. Too much or too little [**analysis of such understanding**] and the [**dancer**’s] careful creeping will be foiled.

As noted earlier, the delineation here is between sophisticated internal mechanisms and passive mechanisms inherent in both structure itself and surrounding forces. For the purposes of this research, we can look to understand a dancer in two ways—the internally practiced dancer, and the passive experiencing dancer. Both are equally relevant in generating and communicating meaning in the body in this specific matrix formed by Flomin and myself.

As ‘internally practiced dancer,’ I arrive at the NYU studios with technical training specific to my body history. On a kinesthetic level, I arrive with a strong sense of verticality, linearity, and power. On a cognitive level, I arrive analytical and perfectionistic. On an emotional level, I arrive anxious and terrified of failure. On the other hand, as a ‘passive experiencing dancer,’ I arrive at the studios with little experience. A one-track-minded, perfectionistic individual

⁹⁵ Shapiro, “Embodied Cognition,” 61.

such as myself has trouble really experiencing the moment, for self-judgment tends to get in the way.

Dance commentator Dr. Sally Gardner notes the following of dance scholar Susan Leigh

Foster's understanding of *dancer as subject* in her article 'Dancing Bodies':

...dancing bodily consciousness is the dancing self's relationship to her/his own body—a relationship that is mediated by the social, symbolic rules of the dance technique (a set of pre-established bodily norms, codes, and conventions). The dancing self is thus a classically liberal 'social' self in microcosm: each dancer, subject to the dance technique (understood as a form of the social), is isolated within a relation to herself. This conception of the formulation of a dancer closes off the possibility of talking about interpersonal relations between the dancer and choreographer as the site of production of modern dance.⁹⁶

This structuralist approach to viewing the dancing body not only separates the internally practiced dancer from the passive experiencing dancer, but also serves to “elide fundamental historical differences between modern dance and ballet in terms of their modes and relations of *production*.”⁹⁷ It is important to note here the delineation between dancer as subject and dancer as producer of meaning. Dancer as subject illuminates a depersonalized, separate body and mind; “a moment characterized by the formative place of the dancer's *physical* relationship with the dancing choreographer as the very site of training.”⁹⁸

Dancer as producer, on the other hand, illuminates an “interpersonal/intercorporeal relationship between the dancer and the choreographer.”⁹⁹ Aligned with the concept of nontrivial causal spread, and as demonstrated in the slinky example above, this concept of passive mechanisms can be equated to inherent physical understanding and interpretation, as it exists between dancer and choreographer. There may be no quantitative reasoning for such

⁹⁶ Gardner, Sally. "The Dancer, the Choreographer and Modern Dance Scholarship: A Critical Reading." *Dance Research* 25, No. 1 (2007): 44.

⁹⁷ Gardner, "The Dancer, the Choreographer, and Modern Dance Scholarship," 42.

⁹⁸ Gardner, "The Dancer, the Choreographer, and Modern Dance Scholarship," 42.

⁹⁹ Gardner, "The Dancer, the Choreographer, and Modern Dance Scholarship," 42.

power in generating aesthetic grace and intrigue; nonetheless, this unquantifiable mechanism between dancer and choreographer is still undeniably powerful. The interpersonal relationship is as present, if not more present, than the physical relationship of body simply doing ‘moves,’ per se.

My experience in the studio with Flomin exemplifies a call for less physical analysis and more inherent physical understanding. “I have a long phrase with precision and directness and another phrase with a wobbly spaghetti feeling. I am interested in blending your quality of precision and strength with letting go and throwing yourself around,”¹⁰⁰ says Flomin in a brief interview. But “don’t be so specific.”¹⁰¹ Interesting. Let us think of this scenario in an autopoietic sense. “The environment is never a neutral environment—it is instead an environment made meaningful to the individual body through physical representation of, interaction with, and evaluation of the dynamic living system and its surroundings.”¹⁰² My individual body was given specific linguistic and physical cues that allowed me to make meaning in my own sense of understanding the terms. Flomin did not specify what exactly he defined as wobbly spaghetti (by means of physical properties), but instead allowed me to understand the reference in my own sense of the quality of what I know as wobbly spaghetti. ‘Don’t be so specific’ pushed me to find this sense of quality over property. Some *properties* of spaghetti might look like this: length, width, density, chemical composition, solid state of matter, or interaction with boiling H₂O. Some *qualities* of spaghetti might look to be more individually determined by means of self-centered ‘interaction with and evaluation of’ the thing itself. The experience of wobbly or loose or not structured is dynamic and

¹⁰⁰ Flomin, Ori. Interviewed by Samantha E. Johnson. Research guided personal interview. New York University Studios, November 2015.

¹⁰¹ Flomin, Ori. Video rehearsal documentation by Samantha E. Johnson. New York University Studios, November 7, 2015.

¹⁰² Colombetti, Giovanna. "Enaction, Sense-Making and Emotion." *Enaction: Toward a new paradigm for cognitive science* (2010): 145-164.

independently determined by my body history and perceptual experience of “wobble” and “spaghetti.”

“Images give movement nuance,” says Flomin. “Intention gives texture. It creates some kind of story telling that is not linear or literal but textural. It’s like when you see a good painting with the right layers and right amount of paint or shadowing and sometimes you say to yourself, ‘I don’t know why I like it but I like it.’”¹⁰³ His way of creating work in the studio generated a lens of understanding for me as dancer that was not literal or linear but textural, personal, experiential, passive, and active all at once.

Intent and texture became the root of all my work with Flomin, both in November of 2015 and in February of 2016 when he was in Brockport for a short residency. Inherent physical understanding of images and texture not only guided the process but also made the process come alive with color and vitality. “If you personally have intention, you will connect to the audience,”¹⁰⁴ said Flomin after a run through of my solo in February. We discussed how, despite my inability to force my experience on the audience as performer, my individual experience of the material was enough to make the work feel fully realized (on part of both choreographer and performer). The specificity of Flomin’s body and the specificity of Flomin’s understanding of wobbly spaghetti (and many other image-based references) were not to be learned or copied by me as recipient, or *subject*, of received information. The specificity was to be found in my own experiential evaluation of the terms and references as they had been and continued to be *produced* in my dynamic living system and surroundings.

¹⁰³ Flomin, Ori. Interviewed by Samantha E. Johnson. Research guided personal interview. New York University Studios, November 2015.

¹⁰⁴ Flomin, Ori. Video rehearsal footage by Samantha E. Johnson. The College at Brockport, Strasser Studio, February 23, 2016.

Too much or too little attention to my [inherent physical understanding and interpretation of] the given movement and verbal references, and I am positive that the desired intent and texture behind the work would be foiled. [Passive experiential tuning in] was the desired texture of the work. It was the universal language generating power in meaning. It was the link between the two body matrices of Flomin and myself that were so incredibly foreign, yet so dynamically connected at the same time.

INFORMATION SELF STRUCTURING [STUDIO VERSION]

Actions of the right sort can take some of the guesswork out of **[performing]**. If one thinks of **[performing]** as a process that generates hypotheses about the contents of the surrounding environment, the point of self-structuring information is to enhance the evidence available to this process; to enrich, or refine the evidence so that the burden on the **[performer]** correspondingly lightens.

Embodied cognition researchers tend to utilize this concept of information self-structuring when referring to species-specific morphologies as they manifest in obtaining the same type of information. As discussed in Chapter 1, humans use motion parallax to obtain cues about depth perception, whereas pigeons use an up and down motion of the head to obtain the same cues about depth perception. Is one more practically efficient for obtaining depth perception information? No, certainly not. Yet is one more practically efficient in obtaining depth perception information for the human specifically, as opposed to the pigeon? Yes, absolutely. Practicality and efficiency are not universal—they are dependent upon the system within which they are being evaluated.

Let us think of Flomin (choreographer) and Sam (performer) as having entirely different morphologies. For the purposes of this analogy, Flomin shall be species X and Sam shall be species Y. Species X has a way of generating hypotheses and processing movement evidence

and species Y has another specified way of generating hypotheses and processing movement evidence. Each has been independently determined by biological, psychological, sociological, and kinesthetic experiences. Let us think specifically about training of each species. Species X trained with Stephen Petronio¹⁰⁵ for nine years in the 1990's and acted as rehearsal director for the company for several years following.¹⁰⁶ It has an efficient way of recruiting muscles specific to learned physical exercises and emotional experiences in the Petronio studio. It has a learned method of “marking” phrase work—easefully in muscle tonality and cardiovascular vigor yet still incredibly grounded and spatially specific. Its evolutionary training history then, though diverse in form over many years, is heavily weighted and rooted in a Petronio practice. Its primary mode of survival as a species was dependent upon successfully (dare I say) ‘embodying’ the form and texture of a specified movement language for many years.

Species Y has a less itemized training background that occurred some twenty years after the initial training of species X. It developed primarily within the competition studio circuit of the 1990's and almost died out as a species in the mid-2000's due to emotional overload associated with meeting performance expectations. It is now a thriving species, interacting constantly with many more progressed dance species of varying forms and practices. By ‘progressed’ I mean to allude to a species with various acquired adaptations that support further survival within a specified environmental ecosystem. That being said, species Y also has a less developed understanding of muscle recruitment and kinesthetic depth, as it is a younger species than species X. It has its own efficient way of “marking” phrase work—driven by movement intention and seeking connectivity through sequence. Its evolutionary

¹⁰⁵ “Stephen Petronio,” <http://petron.io/staff-board/stephen-petronio/>.

¹⁰⁶ Flomin, Ori. Interviewed by Samantha E. Johnson. Research guided personal interview. New York University Studios, November 2015.

training history is spliced by time off from dance and drastic shifts in movement instructors. Its primary mode of survival is adaptation rooted in independent and personal self-discovery.

Similar to comparing two species in differing locations at differing moments in evolutionary time, we can look to compare species X and Y. Adaptations to climate, surrounding species, food chain models, natural selection, and hundreds of other factors are at play. Species Y experienced a training regimen specified by many teachers or varying physical backgrounds. It also is developing its own movement language in a climate where “dance participates in the pursuit of the natural...and intensely private search for inspiration and appropriate expression.”¹⁰⁷ Is the more regimented movement language of species X more or less efficient than the movement language of species Y? I argue no. I argue that practicality and efficiency of generating and performing bodily expression on the part of each species is dependent upon both its resources and systems of evaluation.

Say that both species X and Y have collectively decided that species Y will ‘mark through’ the solo movement material. Species Y presupposes a muscularly easeful, yet spatially rigorous run of the eight and a half minute solo. Species Y presupposes a muscularly easeful, yet cognitively attentive run through. Same end goal: a marked run through of the solo. Differing approaches rooted in biopsychosocial experience and species-specific dance training regimens and time periods. Result? A disconnect in physical expectations. Yet in the noting of such disconnect, might there be a reconnection of the differing species on a level of individualized, unique body?

¹⁰⁷ Gardner, “The Dancer, the Choreographer, and Modern Dance Scholarship,” 42.

My experience ‘marking through’ Flomin’s solo material is a beautiful example of information self-structuring. These are two very different beings with physical, cognitive, and emotional adaptations specific to bodily experience and training; two very different beings with acquired (species specific) modes of sequencing through movement material. Neither approach to ‘marking’ is wrong per se, however one is more practically efficient and applicable to the current studio climate. Adaptation—a key word in this studio process. As I commissioned Flomin to set a solo work on me, there was a presupposed hierarchical framework of the studio space. Flomin was the dominant species (despite me hiring him). I, as less dominant species, was quickly asked to adapt to the climate that Flomin brought with him. My practically efficient and body specific way of marking through his phrase material was no longer practical or efficient. I was in a new climate and the only mode of survival (and hopefully success) as a species was to re-self-structure my mode of understanding ‘mark.’

Additionally, I found this concept of information self-structuring to be pervasive in the packed and overflowing space between Flomin’s call for both extreme physical clarity and attentiveness to inherent feeling of the ‘moves.’ For example, in a video segment of rehearsal, Flomin points to the clarity he is looking for in the “distribution of weight between feet and the parallel nature of the feet relationship.”¹⁰⁸ Following a several minute discussion of the angle of my two feet relative to one another, I repeat the pattern several times to solidify the specific physical relationship of right to left foot in my body and mind. We then move on with the phrase. He looks back at me and says, “Less shapey, Sam. More um...less clear!”¹⁰⁹

¹⁰⁸ Flomin, Ori. Video rehearsal documentation by Samantha E. Johnson. New York University Studios, November 7, 2015.

¹⁰⁹ Flomin, Ori. Interviewed by Samantha E. Johnson. Research guided personal interview. New York University Studios, November 2015.

Admittedly, I was confused. How might I be so specific with my feet one moment, and then ‘less clear’ and more experiential in form the next? “Embodiment matters to cognition because the presence of an active, self-controlled, sensing body allows an agent to create or elicit appropriate inputs, generating good data,”¹¹⁰ says Clark. If perception is a process that generates hypotheses for refining evidence, I was being asked to actively refine evidence from one movement to the next. Only through repetition of the series did I begin to connect clarity with un-clarity in my body. The data I was generating was active physical data, not inactive cognitive data. The sense of understanding the phrase did not come to me through Ori’s words, but instead through understanding how those words were manifesting in the actions of my body—how one moment my feet needed to be x length and y degrees apart and how the next moment my upper torso had to be ‘less specified’ in space.

“Multimodal sensation [is] an integral part of self-meaning,”¹¹¹ says dance performance researcher Dr. Scott deLahunta. In addition to nontrivial causal spread and information self-structuring I found to be apparent in the dynamic studio process between Flomin and myself, I also found an element of independent self-evaluation and meaning generation. As this specific process was characterized by only two intensive visits, one in New York City and one in Brockport, there was a lot of time spent alone in a studio processing through material. I wonder if we might take a quick leap into the extremely personal and emotional journey of this process for me. I wonder what this new theoretical framework might bring to light as I reflect upon the work that came to be titled *It’s Not a Dream...*

¹¹⁰ Clark, Andy. *Supersizing the Mind: Embodiment, Action, and Cognitive Extension*. Oxford University Press, 2008, 21.

¹¹¹ deLahunta, Scott, Phil Barnard, and Wayne McGregor. "Augmenting Choreography: Insights and Inspiration from Science." *Contemporary Choreography: A Critical Reader* (2009): 431-448.

THE PERFORMANCE JOURNEY

This creative process was, and continues to be, an intense and challenging venture for me. I took on this project knowing full well that I would be pushed to my physical limits (for I chose physically rigorous, nuanced professional artists!), however I did not realize the extent to which I would be pushed emotionally. One of my favorite quotations is from the book, *Art and Fear* by David Bayles and Ted Orland. They write:

...to require perfection is to invite paralysis. The pattern is predictable: as you see error in what you have done, you steer your work towards what you imagine you can do perfectly. You cling ever more tightly to what you already know you can do—away from risk and exploration, and possibly further from the work of your heart. You find reasons to procrastinate, since to not work is to not make mistakes. Believing that artwork should be perfect you gradually become convinced that you cannot make such work. (You are correct.) Sooner or later, since you cannot do what you are trying to do, you quit. And in one of those perverse little ironies of life, only the pattern itself achieves perfection—a perfect death spiral: you misdirect your work; you stall; you quit.¹¹²

I am a dangerous perfectionist—“single minded to the point of recklessness” my parents always say. Bayles and Orland’s discussion of perfection within the art-making form not only connects to, but illuminates the experience that was this solo process for me. As mentioned earlier, by nature of the research setup, I was inherently the student, the learner, the less dominant species in the studio space (at least while Flomin was present). I asked to be put in this position so that I may better understand what it means to take on the work, the intention, the meaning of another artist’s work. I willingly stepped into an unfamiliar and less adapted climate. In taking on this position in the studio climate, I was opening my emotional self to heavy critique and struggle from all angles—something I both thrive on and despise all at once. However, when the social context changed and Flomin was no longer present in the studio, I experienced what I will most closely link to this ‘perfect death spiral’ spoken of by Bayles and Orland.

¹¹² Bayles, David, and Ted Orland. *Art & Fear: Observations on the Perils (and Rewards) of Artmaking*. Image Continuum Press, 2001, 30.

Rehearsing a solo is a challenge in and of itself. There are no spectators, no expectations to meet (at the present moment of existing independently in space), and no visual and/or verbal cueing for you as performer to subscribe to. Without feedback from the maker of the work, without knowing I was accurately sequencing through his phrases with adequate attention to say, ‘distance and angle between my feet,’ I froze. I began doing the same material over and over—the material I was comfortable with. Just thinking about the challenging sections, or the sections I knew I would do wrong in some sense of the term, made me anxious beyond belief. ‘I will do that section tomorrow,’ I would tell myself. I spent months believing that if I could not physically reproduce exactly what Flomin had spoken of over and over again those two weekends or rehearsals, I could not do justice to the work. “Believing that artwork should be perfect you gradually become convinced that you cannot make such work. (You are correct.)”¹¹³

Yet what is it exactly that makes the artwork perfect? Where does the ownership lie in the physical production of the movement sequences? As I worked through my emotional barriers and finally asked other trusted faculty and students to come in and watch a run through of the work, I began to see things differently. “You seem scared of the work,” said one fellow student. “The solo is running you instead of you running the solo.”¹¹⁴ I was stalled; I had quit my personal investment with the experience of the movement at the cost of subscribing perfection and physical property understanding to Flomin’s choreographic and performative visions. “Wanting to be understood is a basic need—an affirmation of the humanity you share with everyone around you. The risk is fearsome: in making your real work you hand the audience the power to deny the understanding you seek; you hand them the power to say, “—

¹¹³ Bayles, David, and Ted Orland. *Art & Fear*, 30.

¹¹⁴ Edwards, Joyce. Feedback session with Samantha E. Johnson. March 17, 2016.

you're not like us; you're weird: you're crazy —"¹¹⁵ I argue that my role as performer can be equated to the role of art maker in this sense and that the role of audience can be equated to the role of choreographer (Flomin). The risk in taking on a choreographer's work is that it will inevitably manifest in a new and different body history. Does this mean that choreographer has the potential to be shut out of the conversation once the movement is translated out of their body and into the body of performer? I believe that in taking on this project, I gave Flomin the power to deny understanding of his own creative work. I believe that the translation of physical, cognitive, and emotional language from his body to mine mutely gave me power as art maker, as opposed to art object. The original choreographic canvas was his to paint. I was simply his paintbrush; the executor of the actions and strokes he envisioned in his head. However, being that I inhabit an active physical body (different than a wooden object with no cognitive motor processes), my strokes somehow became the driving force of the work. My strokes became the artwork that was begging for understanding.

¹¹⁵ Bayles, David, and Ted Orland. *Art & Fear*, 39.

CHAPTER 3: CASE STUDY [TAMMY CARRASCO]

My work with Tammy Carrasco began much differently than did my work with Ori Flomin. Carrasco had accepted an Assistant Professor position at The College at Brockport that was to begin in the Fall of 2015. She had just graduated from Ohio State University with a MFA in Dance in Spring 2015 and I admittedly knew very little about her choreographic work. I had observed a class she taught at Brockport as part of the candidate search, so I was vaguely familiar with her movement aesthetic, however, that was about it. When I e-mailed Carrasco back in April of 2015, expressing interest in working with her, she responded, “I like to work with improvisation and movement prompts in process, so I hope that interests you. I do work with my own material, but it all depends on the work and people in the room.”¹¹⁶

I asked Carrasco to be a part of my thesis process because I knew that she brought distinct perspective, body history, and movement vocabulary to the project. I knew she was a young professional artist close in age to myself. I knew she was a recent graduate student. I knew she was probably nervous to be moving across the country, away from her friends and loved ones, and the idea of starting this new job was both exciting and terrifying. I knew that she would be taking on a lot of new things come Fall 2015, but that she loved making dance. Why not ask if she wanted to work with me in this intimate studio process—I knew we could both stand to learn and benefit greatly from the experience.

¹¹⁶ Carrasco, Tammy. E-mail correspondence with Samantha E. Johnson. April 2015.

We began discussing the new work in October of 2015. I was fortunate enough to be enrolled in Carrasco's contemporary technique class that semester so we spent the first few weeks of the semester, prior to solo discussions, learning about the other person on a primarily kinesthetic level. Our relationship began to develop out of watching the other person move through a series of warm-up sequences and larger movement phrases three days per week. Her dynamic, vigorous, athletic frame of movement reference immediately drew me in. Such a small person exploring space so unboundedly; it was exciting and complex, calming and simple all at once.

A few weeks into the semester, we began discussions of this specific solo, later to be titled, *Straight Jacket* for its performance in DANCE/Hartwell the weekend of April 7-9, 2016. We had over 6 months of time together to make this piece. 'Together' being a very important word to note here. The process was long, collaborative, multi-disciplinary, discussion-based, and sprinkled with periods of both intense studio work and out of studio reflection and settling of material. We had the luxury of both being in Brockport for the entire duration of the project, and I believe this greatly influenced the creative process for both Carrasco as choreographer and myself as dancer.

Before outlining what I have hesitantly labeled as progressive phases of the creative process between Carrasco and myself, we must acknowledge that these phases were not at all static or one-directional, but instead fluid, dynamic, interweaving processes—each section informing another; each section embedded within the others coming before, after, and between it. For that reason, I have removed numbers (or order, as it correlates to the progression of numbers) from the labeling of said phases. The order I am presenting is a *generalized* progression of

creative investigation with respect to time, not demarcating linearity in any sense, but instead cyclicity. “Discovery was the process of finding the dance,”¹¹⁷ said Carrasco in a reflective discussion with Sam following performance of the finished piece in DANCE/Hartwell.

Undoubtedly, the finished product of this creative investigation exists somewhere between the lines of the kinesthetic, emotional, and cognitive layering within these (hesitantly labeled, yet inexplicitly identified) phases of creative research. Let us not ignore such dynamic cycling of information as we begin to outline and unpack the many facets of research that occurred within the studio process.

“Each time we came to a rehearsal it was like we were discovering [the piece] for the first time, for both me and for you. I think that kind of did a lot for the depth and development of the dance but also put the brakes on the process in a lot of ways. It was a stop and start process for us.”

- Tammy Carrasco (April 2016)

CREATIVE INVESTIGATION [A RELATIVE PROGRESSION]

Phase [=]: What A Perfectly Stupid Time We Would Have...

Sam compiles a list of text she is interested in. Excerpts come from personal writings, autobiographies, novels, pinterest boards, random labels, cards, etc. Carrasco takes list and circles portions of text that jump out to her. Together Sam and Carrasco decide to come back to the text once they work through some movement material.

¹¹⁷ Carrasco, Tammy. Reflective interview with Samantha E. Johnson. April 18, 2016.

Phase [#]: Have You Ever Made A Chair Dance?

“I’ve never made a chair dance before! Have YOU ever made a chair dance?”¹¹⁸ Carrasco knows she wants something in the space with my solo body. “I like this idea of you coming to and from something,”¹¹⁹ she says. The two of us discuss open-endedly what might feel right for the piece. The conversations are long and have no real trajectory—just thoughts, ideas, challenges, frustrations, desires...all being thrown around and jumbled together in a creative pot. “I guess it’s less so about what the object is and what’s in the space with you that holds meaning...”¹²⁰ Carrasco begins to set a template for Sam’s navigation of the work—person-object and person-experience relationships feel particularly relevant.

Phase [@]: Physically Document What This Feels Like

New idea. We take a small adventure around SUNY Brockport campus to find some new inspiration for movement resources. Carrasco decides that we will make short phrases at differing locations. First, we play with the sound of the metal slats that line the entryway of Hartwell Hall lobby. Then we head outside and find our way to a tree that we then use as both a spatial reference for generating movement and as a structure by which movement can be generated on and around. “Make sure you remember what it feels like to have this perspective underneath the branches,”¹²¹ says Carrasco. Even as the input information changes (i.e., location, space, reference points), the task is consistent: kinesthetically document the experience of being in a specified place and time.

¹¹⁸ Carrasco, Tammy. Video rehearsal footage by Samantha E. Johnson. September 29, 2015.

¹¹⁹ Carrasco, Tammy. Video rehearsal footage by Samantha E. Johnson. September 29, 2015.

¹²⁰ Carrasco, Tammy. Video rehearsal footage by Samantha E. Johnson. September 29, 2015.

¹²¹ Carrasco, Tammy. Journal reflection by Samantha E. Johnson. October 6, 2015.

Phase [^]: 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 9, 8...

Layering of text and movement. After working through a floor phrase in Carrasco's technique class, we both decide that we like the movement and it feels worth exploring further in solo rehearsals. For some reason, the movement 'sticks' and sits strongly with both of us, so why not explore it in more depth? Yet with text still at the forefront of both of our minds, we begin to look for ways to interweave spoken text with the soft, weighted floor material. Approach one involves numbers—Carrasco tells Sam to count up to ten slowly, speaking each number at points within the phrase. The choice of when and how the numbers are voiced lies in Sam's hands. Multiple versions of this are generated. We then layer the text from phase [=] on top of the numbering. These rehearsals are highly improvisatory and relaxed and span a few weeks time.

Phase [&]: What Are Your Feelings On Being Left-Handed

Carrasco is driving to campus one morning listening to the radio. She hears an interview with a mother of a child who is left-handed. She finds herself intrigued by this idea of 'otherness.' She stumbles upon a seeming connection between this interview and some more personal discussions she has had with Sam and this connection brings about the idea of recording a mock interview as text inspiration. The two of us ever so awkwardly record our take on a mock interview about 'being left-handed.'¹²² Although not discussing it directly, both Carrasco and Sam know that the implications of this approach are personal and challenging for Sam. This idea of 'otherness' and identity is complex. Sam is highly invested in her own self-discovery as of late and the dance form is helping to fuel a new sense of permission in her independent existence. So just as Sam works to challenge herself in this studio rehearsal

¹²² Carrasco, Tammy and Johnson, Samantha E. Mock interview recording by Tammy Carrasco. 'Left-handedness.' October 12, 2015.

process, she is moreover challenging herself to find genuine strength, understanding, and peace in her individuality and personal identity...in her ‘left-handedness,’ or ‘otherness,’ we will say. This mock interview reflects the here, the now, and the emotional depth that is both simply aligned with ‘left-handedness’ and more complexly aligned with claiming of identity outside of norms or standards. After much editing, Carrasco and Sam generate a short text that reads as follows:

1. Have ever been forced to write with your left hand?
2. No, but I always felt like, ya know, like I was different.
3. Was school hard school when you learned to write?
4. Yeah, I guess.
5. What are your feelings about being left-handed.
6. I mean, ya know, people make assumptions about me... like I’m a creative type b/c of my left-handedness.
7. Oh gosh, I never thought about that.
8. Yeah.
9. I’m a right-handed individual, so I can’t imagine what it is like.
10. I mean, yeah.
9. She said: What a perfectly stupid time we would have...
8. She said: you should say that again.

Phase [%]: He Said, She Said

The numbers that are being read prior to the text do not seem to be working for Carrasco.

They now feel too distant from the text that was generated in the recent mock interview. So

next step—switch out numbers for “He Said” and “She Said.” The change looks as follows:

He Said: Have ever been forced to write with your left hand?
She Said: No, but I always felt like, ya know, like I was different.
He Said: Was school hard school when you learned to write?
She Said: Yeah, I guess.
He Said: What are your feelings about being left-handed.
She Said: I mean, ya know, people make assumptions about me... like I’m a creative type b/c of my left-handedness.
He Said: Oh gosh, I never thought about that.
She Said: Yeah.
He Said: I’m a right-handed individual, so I can’t imagine what it is like.
She Said: I mean, yeah.
He Said: What a perfectly stupid time we would have...
She Said: You should say that again.

At this point, an overabundance of material, both physical phrase work and text, is mulling around in the space. Carrasco and Sam decide that a short break from working on the solo is not simply desired, but necessary. They have reached a saturation point—kinesthetically, cognitively, emotionally, with respect to motor learning mechanisms. They are not sure. They simply know that time away from the studio is the next logical step in the creative process (note that not being in the studio is still an acknowledged step forward).

Phase [*]: Simmering

Carrasco and Sam have been rehearsing two times per week for an hour mid-day for the past several months. Both incredibly busy individuals, these mid-day rehearsals (1:00 – 2:00 p.m.) have felt abrupt, short, and unrealized. “I just feel like, ahhhhhhh, I need more time, Sam!”¹²³ says Carrasco. “The text just feels like a different dance at this point,” “the movement is so rich,” “the table feels really important now.”¹²⁴ Yes, there is a large table that has arrived on scene of rehearsals; a workbench found in the scene shop, wooden, raised, large, and statuesque. I cannot recall at what point this table came into the picture, but it is now an unquestionably important presence in the work. Beautiful messes of ideas circle the two of us and we decide to live in the chaos of it all. Let it simmer, allow ourselves to exist in the unknown of what this dance ‘is’ or ‘was’ or ‘is supposed to be.’ Carrasco is noticeably frustrated, but not upset, with the process. She is deeply invested in the moment to moment of what this solo is becoming. The process is the most active and dynamic studio process Sam has ever been a part of.

¹²³ Carrasco, Tammy. Video rehearsal footage by Samantha E. Johnson. October 29, 2015.

¹²⁴ Carrasco, Tammy. Video rehearsal footage by Samantha E. Johnson. October 29, 2015.

Phase [+]: Return and Wreck This Dance

“The movement is so rich...I feel like we feel we have an obligation to use the text because we have worked so hard with it...but I am not sure it is really serving what is really happening. Um, but I don’t want to abandon it.”¹²⁵

At this phase in the process, Carrasco is beginning to ask questions as to what this conglomeration of movement, text, inspiration, props, etc., is and what it is becoming. Is the table more important than the text? Can they all exist together or does one feel to be driving the continued development of the work? Specified language of this phase looks as follows:

“What happens if...”

“Let’s try this...”

“Look at this...”

“Assign things motivation even when we haven’t talked about it so it feels like its coming from a place of you.”

There is something important to me about what content emerges in the process. But how can we really let something emerge if we are constantly rediscovering it?
- Tammy Carrasco (April 2016)

PRINCIPLE OF ECOLOGICAL ASSEMBLY [STUDIO VERSION]

The assumption in embodied cognition is that a **[performer/choreographer]** tends to recruit, on the spot, whatever mix of problem solving resources will yield an acceptable result with a minimum effort. Problem solving...is a function of the resources a **[performer/choreographer]** have available to it in its surrounding environment. This makes problem solving an ecological affair.¹²⁶

¹²⁵ Carrasco, Tammy. Video rehearsal footage by Samantha E. Johnson. October 29, 2015.

¹²⁶ Shapiro, Lawrence. *Embodied Cognition*. Routledge, 2010, 62-63.

This concept, I argue, is both supported by, and contradicted by, my studio experience with Carrasco. Problem solving involves engaging available resources for strategies that either fit or do not fit with simplifying or reducing abstract and difficult cognitive tasks (refer to Chapter 1). Simply put, this solo process engaged a plethora of available resources that challenged both choreographer and dancer to increase abstract and difficult cognitive processing mechanisms (as opposed to decreasing or reducing). As illustrated by the timeline above, the process became a journey characterized by an “ecological affair: relating to or concerned with the relation of living organisms to one another and to their physical surroundings.”¹²⁷

I now turn to think a little more abstractly as to how this specified ecological assembly may apply to studio and creative process. As discussed by Gardner, “it is precisely the interpersonal/intercorporeal relationship between the dancer and the choreographer...that must be taken into account if the distinctiveness of modern dance as social and aesthetic practice is to be fully appreciated and recognized.”¹²⁸ Every piece of material generated in this work came from an active engagement of dancer, choreographer, and physical surrounding. Some distinct moments can be noted in each phase of creation.

Principle of Ecological Assembly Applied to Process

Phase [=]:

Material was generated as a result of blending my personal generalized interest in words/text with Carrasco’s personalized text aesthetic. As Carrasco went through my choices of text, she

¹²⁷ “Ecological definition,” <http://www.dictionary.com>

¹²⁸ Gardner, Sally. “The Dancer, the Choreographer and Modern Dance Scholarship: A Critical Reading.” *Dance Research* 25, No. 1 (2007): 35-53, 42.

circled words of interest to her. Already, this process is inherently built upon a structure between two individuals—ideas feeding one another, ideas forming the context for the further creative choices being made by both Carrasco and myself.

Phase [#]:

Open-ended discussions while in the studio. These conversations provided an important template for me in learning how to cognize, or process through, the movement and text material being generated. Similar to the example given with color tile patterns, the cognitive strategy used for solving the problem (reproducing the pattern) is different depending upon the references and resources available to the participant.¹²⁹ Participant given momentary glimpse of tiles, then participant recruits short-term memory storage strategies. Participant given a reference tile for the entire duration of the experiment, then participant recruits less memory and more copying/reproduction strategies. Similarly, if I had been given a momentary glimpse of the ‘task’ or ‘ideas’ in Carrasco’s head, I would have processed through the movement material differently than I did in having continual access to her changing ideas, directions, inspirations, etc. The consistent dialogue allowed me into her headspace, where I was then able to question, dialogue, and translate those thoughts to my own physical and emotional body. I did not have to track or recall as much specified information. I was being given permission to experience and process the emotional content behind the movement as a primary motivator for creation and performance. As noted by Columbetti, embodied cognition recognizes that “meaning is generated within the system for the system itself—that is, it is generated and at the same time consumed by the

¹²⁹ Shapiro, “Embodied Cognition,” 62-63.

system...meaning is always relational in the sense that it depends on the specific mode of co-determination, or coupling, that each system realizes with its environment.”¹³⁰

Phase [@]:

Physical documentation of constantly changing resources, inputs, and physical relationships. This specific phase of studio research is a brilliant example of ecological assembly in that it actively and purposefully engages dancer with a changing environment. “Problem solving is a function of the resources an organism has available to it in its surrounding environment.”¹³¹ I argue that Carrasco utilized changing environment to guide a more complex and inspired generation of material as opposed to a more simplified model of movement generation. The principle of ecological assembly highlights the tendency for humans to recruit the simplest cognitive mechanism for successfully completing a task. However, Carrasco’s process called for a more complex form of problem solving. “What do the slats sound like?” she asked. “What does that make you want to do physically?”¹³² She was not interested in an accurate solution to a problem, per se, but instead interested in a deeply investigative state of problem *solving*. She was interested in the state of experience as opposed to the state of finding an answer. So although a beautiful example of ecological assembly in its simplistic nature of dynamic interplay between participant and environmental shift, it is a less accurate example of the cognitive system finding simplicity in task based processes. In fact, my experience in working to find physical documentation of say, ‘being the branches of a tree’ or ‘experiencing the sound of the slats in a physical nature,’ was one of the most complex and counterintuitive experiences of the process. There was no solution, no end goal, and no right

¹³⁰ Colombetti, Giovanna. "Enaction, Sense-Making and Emotion." *Enaction: Toward a new paradigm for cognitive science* (2010): 145-164, 148.

¹³¹ Shapiro, “Embodied Cognition,” 62-63.

¹³² Carrasco, Tammy. Journal reflection by Samantha E. Johnson. October 6, 2015.

response. There was solely my individual body and my experienced surroundings to make meaning in the most individualized and relativistic sense of the term.

Phase [^]:

Layering of movement and text. I now note what Varela, Thompson and Rosch conceptualize as the experience of color—a hypothesis that states that, “color experience is created through a unique sort of embodied coupling...there is no single physical property with which experience or a single color coordinate.”¹³³ VTR highlights what they refer to as the color constancy phenomenon. If I move a color patch from one surface to another, my experience of that color can change immensely, despite the fact that the color patch is still reflecting the same frequencies of light. On the contrary, if I move a color under different frequencies of light, the patch can sometimes appear one consistent color, despite its exposure to different frequencies.¹³⁴ So what is the significance of this color constancy phenomenon when it comes to studio practice of layering movement and text? First, under this assumption, it is impossible to locate color independently from our perception of color. Color is only defined when located within an experiential model of the world. Similarly, under this assumption, it is impossible to locate text independently from our perception and understanding of the specific collection of characters and associations assigned to those characters (as understood in our independent bodies). Second, under this assumption (and keeping in mind the principle of ecological assembly being applied here), it is impossible to separate out a real solution to what the text ‘means’ or ‘represents,’ similar to color having “no physical property with which experience or a single color correlate.”¹³⁵ The text does not correlate with one given

¹³³ Shapiro, “Embodied Cognition,” 82.

¹³⁴ Shapiro, “Embodied Cognition,” 82.

¹³⁵ Shapiro, “Embodied Cognition,” 82.

movement, and the meaning generated for both dancer and choreographer in producing a layering of movement and text does not correlate with the same individualized text/movement ‘experience.’ As dancer, I was given the freedom to layer text upon a pre-assigned movement phrase. With no measure upon which to guide my choice making towards correctness, every run through of this layering section became a new color swatch upon which to view the same movement/text material. Source material remained exactly the same. However the *experience* of the source material in relation to present environment—different with every step taken, every word spoken, and with every minute, hour, and day that passed.

Phase [&] and [%]:

We can look at these phases quite simply with respect to ecological assembly: a compelling example of “abandoning strategies that no longer fit for more efficient ones”¹³⁶ within the creative studio setting. The ‘left-handed’ interview seems rather arbitrary, right? What does this have to do with anything the two of us had been working with in the studio (movement or text wise)? It seems strange and maybe not “traditional” to listen to an interview and use it as guidance for movement generation, doesn’t it? It is often artistic bodily choices such as these that make contemporary modern dance “feared as an intimidating, often impenetrable cultural pursuit for general audiences who worry they might just not get it.”¹³⁷ Although a much larger topic for discussion (and a topic I will not delve into for the purposes of this research project in particular), I note it here because of its undeniable impact upon perceived body techniques and strategies utilized in the modern dance practice.

¹³⁶ Shapiro, “Embodied Cognition,” 63.

¹³⁷ Lederman, Marsha. “Stepping into contemporary dancer Crystal Pite’s choreographed life.” *The Globe and Mail*, February 12, 2016. Accessed February 15, 2016.

Marcel Mauss, early twentieth century French sociologist, claims that, “body techniques can be classified according to their efficiency, that is, according to the results of training.

Training, like the assembly of a machine, is the search for, the acquisition of, an efficiency.”¹³⁸ This ‘efficiency’ is the key connector between Andy Clark’s definition of ecological assembly (as utilized in embodied cognition) and Marcel Mauss’s delineation of body techniques and training. Mauss’s definition of efficiency situates itself within norms and expectations of body training. A dancer is expected to execute “x” move at “y” height with “z” amount of aesthetic ease and grace. Efficiency lies in meeting standards or expectations of specified and nuanced body language; efficiency is situated within the body and solely within the body. On the contrary, Clark’s recognition of ecological assembly situates efficiency within a dynamic, ever-changing environment. Choices and exchanges made with the external environment in the creative process are as important, if not more important to the bodily training of dancer, than achieving “x” move at “y” height.

This process with Carrasco exemplifies body training by means of efficient interaction, as opposed to efficient action. Strategy of making personal choices was an embodied practice prevalent throughout this work. In performing the solo in DANCE/Hartwell, I note that this generalized idea of ‘left-handedness,’ and the process of digging into what this concept meant to me as an individual, was consistently at the forefront of my mind. “Really experience it,”¹³⁹ Carrasco would say. My experience of the material was constantly changing relative to my connection with ‘left-handedness,’ or ‘otherness,’ in that specific moment. At this phase of the process, the prescribed movements of the work started to feel secondary. However they

¹³⁸ Mauss, Marcel. "Techniques of the Body (1934)" in Jonathan Crary and Sanford Kwinter (eds) *Incorporations*, NY Zone, 1992.

¹³⁹ Carrasco, Tammy. Journal reflection by Samantha E. Johnson. February 17, 2016.

were not secondary in the sense of less importance, but rather in the sense of reactivity. In my experience with the development of the work, the actions I was making with my body only developed meaning and came to life as a result of my experience with the intention, the physical doing and experiencing of the thing—the feeling of ‘otherness,’ the attention to the ‘feeling of otherness,’ and the expectation as to what ‘otherness’ was in my life.

Phase [*] and [+]

Ecological assembly is inherent in the language utilized in this phase of the process. Let us recall some of the language found in the studio: “What happens if? Let’s try this... Look at this...” These are all relational terms—situated with respect to me as mover, Carrasco as maker, and environment as guider of information resources. For instance, “what happens if you increase the speed, then run around the table, then find a way onto to table, and repeat the phrase slowly?”¹⁴⁰ Carrasco was changing dimensionality of the work with respect to the dynamic moving parts of performance—like the table for example. She did not ever speak to what the body technique should ‘look like’ on top of the table, but instead spoke to the movement as a *reaction to* being ‘on top of’ the table. The feelings of fear, anxiety, height, weight associated with being on a raised 3x3 foot platform.

Efficient forms of relational material-generation were a predominant force behind this work. Efficient forms of body technique and goal-oriented movement were much less predominant. What I mean by this is that efficient options (as indicated by ecological assembly theory) were generated within a system of multiple bodies, objects, and experiences. The resulting

¹⁴⁰ Carrasco, Tammy. Video rehearsal footage by Samantha E. Johnson. February 2015.

call for personal efficiency in body technique was only evident as a result of ecological efficiency within the system.

So how can we really let something emerge if we are constantly rediscovering it? If we are constantly going between these different phases of creative investigation? I argue that the answer to these questions depends entirely upon what we are defining as the ‘something’ or the ‘it.’ What ‘something’ is emerging and what ‘it’ are we discovering in this solo work? Ecological assembly, as described specifically in relation to the many said phases of creative investigation listed above, alludes to an inherent sense of reactivity within the discovery process; a reactivity to kinesthetic self, to emotional self, to thinking and judging self, and furthermore a reactivity to a sense of dynamic environmental impulse. So, what emerged within this dance was in fact simple discovery (not to make it any less of a finished product I might add). In the end, what came to define this dance was the interweaving of discoveries made within each phase of the process and within each moment I performed the work on stage. What came to define this dance was the blurring of edges between self and environment, the accumulation of experiences in process and performance, and the physical documentation of this living, breathing organism we named *Straight Jacket*.

OPEN CHANNEL PERCEPTION [STUDIO VERSION]

This concept is less suited for direct exchange of descriptive identifiers when applied to the studio setting (as I have utilized in all of the past conceptual frameworks of analysis).

However, this is not to say that we cannot find direct correlation between the embodied cognition concept of open channel perception and the studio concept of open channel perception. Let us recall from Chapter 1:

Other theories of cognition might focus on building internal representations of the environment, plotting a course of action, and finally checking in with our environment periodically to be sure we are progressing adequately as expected. In this case, perception acts a **secondary form of response** to internal mechanisms **independent of the changing surrounding environment**. The Gibsonian model of perception instead favors a **constant change in point of reference** as the world changes around us—Gibson proposes perception as a dynamic and active process.

Now let us look at a rehearsal reflection excerpt from February 17, 2016:

The performative nature of the piece seems to come from my **doing of the things**. My **interaction with** the space, time, the table, the edges, etc. There's something important about the **weight of the space** and how I am **navigating it**.¹⁴¹

My experience in the performance process of Carrasco's work exemplifies this aforementioned constant change in point of reference as related to active and dynamic perception. To illustrate this concept more clearly, let us think about what the performance process might have looked like under the assumption of perception as a secondary response to internal mechanisms (an opposite take on embodied cognition, and an allusion towards the more traditional dance forms). Under such a cognitive model, the perceptual system of dancer (me) would act as a quantitative marker of surroundings. Notes to self might look as follows: table is located at x location; movement y takes place on top of x, at z speed, for example. The role of the dancer perceptual system in progressing through the solo material would then have been to "check in periodically to be sure [she] is progressing adequately as expected."¹⁴² She does y move adequately on top of location x, etc. In this scenario, each movement would have an expected form, and the dancer's goal would be to execute expected form despite variances in environment (i.e., stage lighting, stage set-up, audience feedback, emotional state, physical state, etc.).

¹⁴¹ Carrasco, Tammy. Journal reflection by Samantha E. Johnson. February 17, 2016.

¹⁴² Shapiro, "Embodied Cognition," 63.

However, as noted explicitly in rehearsal footage and performance video, this solo was built upon personal investigation and *navigation* of changing surroundings and personal experience with movement material. Each performance night was a new experience—and the body acted as a dynamic response unit to those changing experiences. There were simply no quantitative ‘markings’ to be had in the performance of this work, because the markers, or points of reference, changed constantly. The markers were experiential in form, as opposed to physical. What do I mean by this? I mean to say that as performer within this work, *Straight Jacket*, my perceptual markers were reactive and real in physical form. There was simply no way to ‘adequately progress’ through the solo because adequately progressing would mean giving up the actual *experience* of interacting with space, time, table, edges, boundaries, and so on. The performance of this piece was an open channel of perceptual exchange, at both the kinesthetic and emotional level of cognitive processing.

Ambitious and progressive visual artist, Matthew Ritchie, discusses the ‘project of modern art’ with respect to his drawing work as follows:

Each time the drawing is reproduced, it gets bigger and bigger and contains more detail, because it always has to include not only all the elements that I’ve made since then, but also the previous version of itself. So it’s like a kind of cross between a dictionary and a map, like a living document of its own history, and a history of all the hands that have participated in its making. It’s what keeps it alive in some ways.

Straight Jacket can be viewed in the same way Ritchie’s work can be—as both a dictionary and a map. It is a dictionary of the many phases of creative investigation and a map of the individualized experience navigating the layers of these definitions. As these terms, or ‘phases’ swirl, cross, highlight, and question one another, meaning is generated in and by the work. This beautifully chaotic, swirling of definitions on the page is what gives the work breath and a sense of liveliness; meaning then emerges out of this constantly changing

experiential pattern on the page. Never will the lines swirl or overlap in exactly the same way in this work. As the theory of open channel perception alludes, the points of reference, or might we say overlap of lines on the page, are always shifting. The life of the work exists in the constantly changing pattern within the dynamic chaos. Lines may be erased, thickened, redrawn, enhanced, forgotten...but the page still becomes more detailed in form. Nothing is ever truly lost or forgotten. It is just redirected, re-informed, re-‘marked’ as a new point of reference from which to navigate this map.

THE PERFORMANCE JOURNEY

This was unassumingly the most challenging and rewarding creative experience I have ever been a part of. I argue it is a vivid rejection of the concept of corporeal impersonalism with respect to appraisal and arousal and a vivid illustration of the said bi-directional power of bodily arousal, as mentioned in Chapter 1. I cannot adequately explain, or put into words, the physical experiences that overcame my body in the making and performance of this work. I cannot adequately even touch upon the physical weight of emotion that I experienced. I quite honestly do not have a clear ‘cognitive’ understanding of why or how I was experiencing the work so deeply. However I do have a physical memory of those experiences. I have a physical memory of standing atop a 3x3 table, in front of hundreds of people, feeling not exposed but entirely vulnerable to my own self. I have a physical memory of walking into the streaming sidelights knowing nothing but those seconds of existence. I have a physical memory of taking off my red sneakers in the downstage right corner of the space, and staring at them for what felt like both an eternity and a millisecond. I have a physical memory of

feeling both bared and safe, and empowered in the unknown of the entire performative experience.

“Appraisal and arousal research has shown that the nonneural body does in fact contribute to an emotional and kinesthetic formulation of meaning within the body.”¹⁴³ Uninterpreted arousal, “arousal for which subjects do not have an explanation,”¹⁴⁴ feels incredibly relevant with respect to this concept of nonneural body. Before moving forward, I must be clear and acknowledge that every human experience (of emotion, physical sensation, cognitive processing, etc.) is in some form directly and dynamically linked to a neurological pattern within the body, for electrical and chemical signaling is what keeps us alive and capable human beings. However, this concept of nonneural body is still relevant in the sense that sensation lies disparate to understanding (or kinesthetic experience lies disparate to central nervous system processes). For instance, I may not know why I experienced such emotions and sensations on stage while performing this work, however my lack of understanding of the said ‘aroused state’ does not make the experience “meaningless or experienced as emotionally neutral.”¹⁴⁵

Recall from Chapter 1 the notion of corporeal impersonalism, which proposes that “a purely disembodied human emotion is a nonentity; if you imagine an emotion without its bodily symptoms, you will be left with some cold-blooded and dispassionate judicial sentence, confined entirely to the intellectual realm.”¹⁴⁶ My experience performing this work directly supports the notion that corporeal impersonalism is a restricted and inadequate way of

¹⁴³ Colombetti, “Enaction, Sense-Making and Emotion,” 147.

¹⁴⁴ Colombetti, “Enaction, Sense-Making and Emotion,” 147.

¹⁴⁵ Colombetti, “Enaction, Sense-Making and Emotion,” 154.

¹⁴⁶ Colombetti, “Enaction, Sense-Making and Emotion,” 152.

viewing human emotion and experience. My physical memories on stage, my uninterpreted arousal we might say, were emotionally dynamic and incredibly humanistic and real. Noting the presence of such physically felt and emotionally charged arousal, despite a clear cognitive appraisal of why or how that physical state was arrived at alludes to a bi-directionality in appraisal (the neural, ‘thinking body’) and arousal (the nonneural, ‘experiencing body’).

My physical body experience of human emotion, despite cognitive understanding or adequate references to make sense of the emotion, is what I personally would define as the purpose, the meaning, the intention behind this work. As Carrasco stated in our reflective discussion:

I guess I was afraid that if I knew consciously that I was thinking about these kind of human challenges, or like the challenges that we face in the world, that the dance was going to be too transparent, too literal, too easy to watch. But I think ultimately I was really satisfied by having something tangible for me to understand, but also enough in the movement, and in your performance, and diverse enough in the creation for there to be different ways in...¹⁴⁷

I argue that such striking and purposeful attention to our humanity, our individual personhood, and to our constantly shifting emotional reactivity in this whirling process and performance, is what allowed me as dancer to more fully grasp what embodied cognition researchers mean by the term nonneural body. It was not so much about understanding why such emotional experiences were taking place (as a reaction to x or y) but instead about acknowledging that whatever those physical moments of arousal and input were, were real and worth trusting. Because that trust in my own experiences as performer, and that trust in the unknown of fully understanding every moment, is what made this work come alive. That trust on part of both Carrasco and myself is what seemingly took this piece from a two dimensional image of messy overlapping lines and moves on a page, to a living, breathing,

¹⁴⁷ Carrasco, Tammy. Reflective interview with Samantha E. Johnson. April 18, 2016.

three dimensional organism wrought with vibrant body histories, blurred edges, and colorful maps of *choose your own adventure*.

CONCLUSIONS: LOOKING FORWARD

The goal of this thesis research investigation was to begin to introduce scientific theory into the realm of embodied researcher; to begin to blur the edges between two seemingly disparate, yet individually resourceful and rigorous disciplines: cognitive science and creative dance practice. I acknowledge that the premise of this research agenda is vast and seemingly skims only the surface of questions regarding cognitive embodiment theory and application. I acknowledge that the preceding chapters provide only a small glimpse as to how cognitive science and dance performance practice might interact, inform, and regenerate meaning in the body. However, my hope is that this research helps to generate a new and distinct template for viewing embodiment theory in modern dance performance. How might the concise nature of scientific theory help us further connect and understand the process of dance creation? How might scientific principle inform the living, breathing web of abstract idea and thought that underlies performance? And inversely, how might embodied research in dance practice and performance seek to inform scientific principles?

“We have neglected the gift of comprehending things through our senses. Concept is divorced from percept,”¹⁴⁸ says dance scholar Jan Van Dyke in her article titled, “Vanishing: Dance Audiences in the Postmodern Age.” Optimistically looking towards a future where dance theory and scientific theory research may coexist, I wonder why it is that conception is often viewed as more valid than perception. Conception implies a generalized understanding of underlying principles or properties whereas perception implies a more personalized reckoning as reactionary response to such principles and properties. Why is it then that understanding something conceptually is put on a pedestal? I have no answer to this line of

¹⁴⁸ Van Dyke, “Vanishing: Dance Audiences in the Postmodern Age,” 223.

questioning. Instead I look to challenge this idea of conception as primary mode of understanding and generating meaning. I look to challenge us all to invest in the idea of the perceptual body as primary brain. How might the body act as another brain by which the human experience is lived through?

As illustrated through the ethnographic, embodied research of this project, theories of embodied cognition can, in fact, be found sprinkled throughout (if not baked in to) the seemingly abstract creative process that is dance making and performance. Words and theories can be applied to the creative strategies being utilized in the studios. Concepts commonly applied to robotic mechanisms can in fact be broadened to a world of doing and moving bodies.

I found the embodied cognition framework to be a potent, alternative, and exciting overlay and way in to studying the performance process and meaning generation in the body. Nontrivial causal spread identifies a distinction between internal mechanisms and more passive inherent mechanisms situated within a dancing body. Ecological assembly theory identifies a definitive form of creative process and choreographer-dancer interaction. Open channel perception helps us understand performance as both a dynamic and active process of bi-directional entity. Lastly, information self-structuring theory points to “the presence of an active, self-controlled, sensing body [that] allows an agent to create or elicit appropriate inputs, generating good data.”¹⁴⁹ All of these concepts, though specifically defined within a clear, explicit, scientific discipline, can (and certainly did!) inform a discipline that feels both ethereal and corporeal. Not only do I believe that such a scientific model can inform this

¹⁴⁹ Shapiro, “Embodied Cognition,” 64.

creative discipline, but I believe this model of understanding the body and mind can actively provide a new lens for understanding a form of art that “exists at a perpetual vanishing point.”¹⁵⁰

In speaking with an advanced photography class at SUNY Brockport regarding the interdisciplinary nature of embodied cognition research, one student said to me: “I try so hard to understand dance but I just have so much trouble (and I am an artist)! It’s not like with a piece of photography or visual art or even music where I can go back and look at it again or listen to it again. It’s just there and then it’s gone; I can never go back and try to understand it.”¹⁵¹ I note this comment because it directly points to our generalized need, at least in Western art forms, to “overintellectualize our capacity to evaluate or understand.”¹⁵² So how might embodied cognition models yield a deeper understanding of the body not simply as a secondary perceptual apparatus but instead as a primary apparatus for perceptual understanding and meaning making? How might this model of science help us release the need to ‘overintellectualize’ and ‘adequately understand’ something at the level of brain? How might such a concise scientific model help us trust ourselves as humans in our physical, reactionary, unconsciously processed responses to both existing within and viewing a work?

I acknowledge that this research agenda is vast and that the majority of these questions still remain unanswered. My hope is that aligning science and art in process might reveal new and progressive avenues for studying the active, self-controlled, sensing body. For instance, let us briefly recall the Mirror Neuron System, MNS (covered in Chapter 1). Simply, the MNS

¹⁵⁰ Siegel, Marcia B. *At the Vanishing Point: A Critic Looks at Dance*. Dutton Adult, 1972.

¹⁵¹ Advanced photography undergraduate student. *Inter-Disciplinary Research Presentation*. April 18, 2016.

¹⁵² Colombetti, “Enaction, Sense-Making and Emotion,” 147.

alludes to integrated motor patterns that directly correlate with neural activity. Studies with dancers have revealed that increased neural activity in the brain is directly correlated with embodiment of action prior to viewing the action. If a dancer has performed the action in the studio before viewing the action on some other body, their response to the action is heightened.¹⁵³ For the purposes of this research agenda, we will leave this here. However, from an embodied cognition lens, I ask the following: Does the MNS only respond to the physical action taking place, or might it also be reactive to the *experience of* the physical action? What do I mean by this? Let's take an excerpt from my solos, *Straight Jacket* and *It's Not a Dream*.

In *Straight Jacket*, I first perform a series of side steps from the upstage right corner of the stage. Emerging from the sidelight, hands laid gracefully upon my head, I skim the surface of the floor with ease. I then walk to the table, jump upon it, and repeat this side step action atop the 3x3 platform. My question lies in whether a viewer, having embodied the simple action of the stylized side step, might have an increased MNS response to the action when they view it atop a heightened platform? The viewer, having experienced height (and the possible fear, or anxiety, or any emotion individually associated with height) not only has the physical experience of the side step action now, but also has the emotional and perceptual experience of being a body experiencing height. Similarly, I perform a series of highly stylized shifts in sitting position at the beginning of *It's Not a Dream*. Are these simple physical moments also representative of an MNS system response heightened by experience of the emotional states observed? Does a familiar experience of looking, longing, investigating ones surroundings heighten the physical MNS response (on top MNS response to the physical experience of the

¹⁵³ Cross et. al., "Building a Motor Simulation," 2006.

shifting positions)? Although an admittedly complex line of questioning for scientific research, I wonder if the broadened view of the body as an integrated system of both brain and physical body (as a brain in and of itself) might carry concepts of effort, quality, and emotional experience into the realm of a rigid and standard dance science discipline.

Thus the nature and role that mimetic empathy plays in a dancer is not mere representation, but a materiality grounded in bodily experiences of the choreographer's way of dance-making, which, through mimetic mirroring of movement qualities and emotions and intent, becomes a shared vision both in actual presence and, possibly, in actualizing absence. In this way, mimetic empathy is not only a re-presenting or re-imagining, but has a decisively corporal, physical, tangible quality from which the dance ultimately emerges and from which it derives aesthetic, cultural, historical, and social significance.¹⁵⁴

Sensation lies disparate to understanding. We all experience this in our everyday lives. You see a piece of art and you don't know why you like it but you are drawn to it. You listen to a piece of music and you are immediately brought to that time you were driving down the California coast with your sister blasting music as the fresh coastal air pushed your hair in too many directions. You meet someone for the first time and there is just that connection that can't be explicated in words, but it is felt; you understand one another, you feel one another deeply. Putting words to such moments would only be limiting, permanent, and unsatisfactory to the human experience of it...

These solos, though now existing in the past in both process and performance, are still living and breathing through my body. As emphasized in the individualized responses to each creative process, I was consistently asked to experience moments actively as they lived through my body in that specific moment. Learning to trust these moments of physical

¹⁵⁴ Warburton, Edward C. "Of Meanings and Movements: Re-Languaging Embodiment in Dance Phenomenology and Cognition." *Dance Research Journal* 43, no. 02 (2011): 65-84, 74.

arousal and the dynamic experience of physical body (as related to environment) was both challenging and liberating as a dancer in process. Cognitive understanding of action was only the baseline upon which to engage with these processes. There was no solution, no end goal, and no right response. There was solely my individual body and my experiential surroundings to make meaning in the most individualized and relativistic sense of the term. Trusting the body as an active and self-controlled system of evaluation, a body “actively refining physical evidence from one movement to the next [and hence] generating active physical data,”¹⁵⁵ was an integral part of bringing these works to life.

“Nothing is ever truly lost or forgotten. It is just redirected, re-informed, re-marked as a new point of reference from which to navigate,”¹⁵⁶ says visual artist Matthew Ritchie. This project, although physically ‘vanished’ in time and space, exists in my body for the remainder of its lived experience. My body now holds experiences that act as new points of reference from which my body alone can navigate forwards; my body now holds investigative power in its release from the need to find ‘adequate meaning or understanding’ in these works. Although I can cognitively process through many aspects of this experience (and clearly write about them in some form of comprehensible manner), I can also cognitively process that most aspects of this experience are unquantifiable. Such definitive concepts and theories of embodied cognition allow me to step back and view this process as an interpersonal/intercorporeal dialogue of body histories, a re-linguaging of kinesthetic understanding, and a “dynamic dance in which body, perception, and world guide each other’s step.”¹⁵⁷

¹⁵⁵ Colombetti, “Enaction, Sense-Making and Emotion,” 157.

¹⁵⁶ “Matthew Ritchie in “Structures”” from *Art in the Twenty-First Century* Season 3 (2005),” <http://www.art21.org/videos/segment-matthew-ritchie-in-structures>

¹⁵⁷ Shapiro, “Embodied Cognition,” 61.

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