

KNOWING IN THE BODY: A DANCER'S EMERGENT EPISTEMOLOGY

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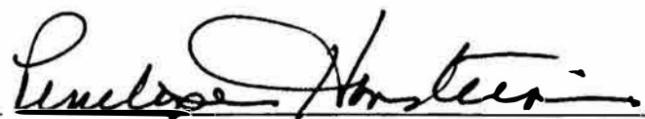
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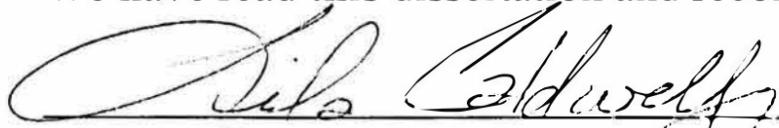
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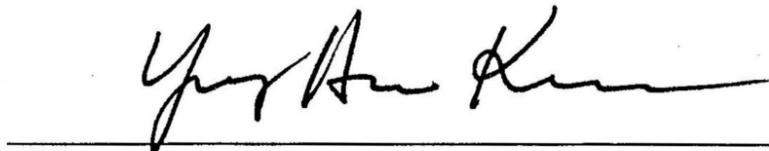
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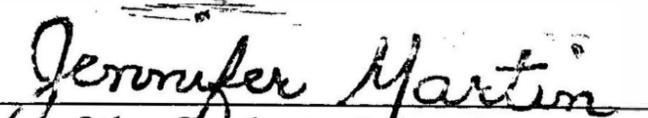
  
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## ABSTRACT

MARGARET WILSON

KNOWING IN THE BODY: A DANCER'S EMERGENT EPISTEMOLOGY

MAY 2007

The purpose of this study was to explore how knowing in the body develops when dancers translate and integrate detail and sensory information about the structure and function of their bodies, both through movement exploration, and in their dancing. In this research I asked how the body both can be a site of knowledge and how this knowledge develops and emerges. I reflect on the implications of this research as it pertains to pedagogy, and throughout this document I describe a pedagogy that puts the body (back) at the center of teaching in dance.

Four courses which blended anatomic information with experiential application, both in terms of improvisation and exploration and within a structured dance technique class, and two biomechanical studies generated data for analysis. The data collected reflects different research and pedagogical approaches which provided multiple sources of information. A case study methodology allowed me to look in depth at each group and grounded theory methodology allowed me to integrate multiple sources of data for analysis.

Framing the data within a larger milieu, created through a review of literature in ecological affordance, embodied cognition, phenomenology and embodiment, I detail how dancers are *Bodies-in-the-World*, who through research, exploration and integration of information about all bodies, explore more deeply their understandings of their own bodies. When dancers integrate knowledge of the body with knowledge of their dancing, this knowledge acts as an *attractor* that leads to the development of an individual physical knowledge – a knowing in the body. Each dancer has an individual epistemology that develops from her experiences and her expectations. This epistemology, *knowing in the body*, develops in action and is influenced by many different sources.

Understanding how dancers develop *knowing in the body* presents a new paradigm for pedagogy. Placing the body back at the center of dance, a bodily centered pedagogy creates a different paradigm for teaching dance. In addition to learning about movement, a bodily centered pedagogy teaches dancers how to access a *knowing in their bodies* when they are dancing.

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## CHAPTER I

### WHAT IS *KNOWING IN THE BODY*?

Dancers often state that they have muscle memory, or that they “know movements in their bodies.” But what is muscle memory? Is a dancer’s “knowing” a feeling, a confidence, or simply a movement patterned so efficiently that she no longer needs to think about it? And when a dancer experiences movement, is she informed consciously or subconsciously about how her body is creating the action she desires? More specifically, does the experience of moving, informed by a sensation of the limbs and muscles develop a knowing in a dancer’s body? Finally, if a *knowing in the body* exists, can we recognize and build on this somatic knowledge? And how does this knowing develop? In short, what does it mean to know something in the body?

As dancers move in the world, they are already negotiating the physical properties of the world with their bodies. Dancers (and non-dancers), constantly affected by the force of gravity, adapt to this limitation without explicitly thinking about it. However, dancers also move in very particular ways, adhering to the different styles or techniques they are studying or performing. Through repetition and practice, augmented with feedback, dancers acquire knowledge of their movements. As they develop knowledge of their movement, dancers do not have to think about their actions or the particular details of the actions they are performing. Finally, from this movement

knowledge, when dancers are engaging in action with their individual bodies, they begin to develop knowledge in their bodies.

In Western theatrical dance at the beginning of the 21<sup>st</sup> century, dancers are expected to be both technically proficient and somatically savvy. This requires them to develop skill in the mechanics of movement and performance, but also to learn a bodily way of knowing that favors kinesthetic process over a cognitive reflection upon movement. Yet, within specific dance techniques, do dancers discover a “dancing body” or their own bodies? As a dancer tries to match her movement to the aesthetic ideal in the dance form, is her own body understood, or unobserved? In other words, do dancers acknowledge their bodies as their own when dancing, or do they simply view their bodies as any body?

While the dancer’s body is the medium through which she works; it is also a source of information. As pertains to the latter, a dancer can better understand movement when she recognizes how her body is helping create the actions she desires. For example, a dancer can identify and perform circular motions of the arm in the shoulder joint or leg in the hip joint because she understands, or has embodied the concept of the rotary configuration of these joints. The information the dancer gets from her body in these joints is markedly different from information she receives from the knee or elbow joints.

One means for a dancer to develop a better understanding of the body, and her body in particular, is through the study of anatomy and kinesiology. Dance kinesiology looks at how movement is created in the body. This rich and complex area of study can

be addressed on many different levels. Names of muscles, muscle actions, origins and insertions of muscles via tendons, joint actions, planes of motion, energy expenditure, and neuromuscular patterns involved in learning comprise but a fraction of the information about the body that can be studied. However, the individual dancer's ability to retain all of this information may be limited. In fact, some dancers may prefer not to understand or consciously retain this information about the body. Yet, if the time spent teaching kinesiological principles is justifiable, each student should integrate the information presented on some level.

I have been teaching kinesiology for many years and I know that this anatomical information can be valuable to dancers, but often my students do not understand or integrate the material as thoroughly as I would like them to. Augmenting academic study of the body with movement exploration offers one means of helping the student embody, and thus make meaning from, the anatomic and kinesiological information.

If a dancer wishes to understand specific anatomical information about the body, one method for accessing this information might be through the exploration of movement around a concept that she has learned from academic study of the body. In applying information about the body to a specific movement or action, integrating a somatic approach with a kinesiological approach, the dancer learns to understand her body in context. Another approach is simply to explore the information in the body to develop a feeling for the information. Both of these approaches represent a somatic, or body centered method for understanding anatomical information.

Somatics is a very general term that indicates a dancer is engaging with her body at some level in an attempt to know or become comfortable within her own body.

Although there are many somatic techniques, all of them can be defined as “bodily based access to information about the whole system and its interactive patterns” (quoted in Fitt, 1996, p. 304). Somatic explorations are based on discovering the wisdom of the body; these explorations complement learning to understand the structure and function of the body. Any of the somatic techniques, for example, Alexander Technique, Feldenkrais, or Body Mind Centering, provide rich experience and information that benefits the dancer. However, I adopted a somatic *approach* in the development of the research, rather than a particular somatic practice: I asked dancers to access their bodies somatically, to engage with their physicality and their awareness.

Somatic work is usually done outside of a traditional dance course. For example, a somatic exploration would be conducted with the dancers lying on the floor, or working with partners, so they could focus is on the sensation, rather than the action. However I extend the idea of somatics to include more active exploration as well: moving fully through space with a focus on the internal environment of the dancer’s body, and linking this sensation with both general and specific movement. *Therefore throughout this document I will use the term somatics in this general way, indicating an approach, rather than a practice, and I will also use the word interchangeably with the term experiential.*

While many dancers come to know their bodies and to know in their bodies simply through movement, my experience tells me that dancers come to understand their bodies when they study the body *in* their bodies. Dancers need not study kinesiology in

depth to understand how their bodies move; conceptual anatomic information gives them a context for understanding their bodies in movement. Yet, if dancers have an ability to understand and embody anatomical information and it informs their dancing in ways that make their work 1) more efficient, 2) more aesthetic, and 3) more efficient and aesthetic, could we call this *knowing in the body*? And, how do dancers make meaning from this information?

Rather than comparing the merits of either an academic or experiential approach, as a researcher I was interested in examining the effects of combining these approaches to learning about the body. Specifically, I was interested in what would be translated from the anatomical model and somatic experience for the individual dancer in a general as well as a practical manner. In addition, I wanted to examine how students processed anatomical information through the medium of movement and how they made meaning from this experience. Therefore the study of the body would be augmented with study *in* the body.

This blended approach of understanding the body through movement is not new work; experiential anatomy has existed in dance curricula for many years. This action-oriented method is designed to help students “feel” physical principles in their bodies. This approach also assumes that what is experienced in movement, or in a specific improvisation, creates awareness of physical sensation at a bodily level. Therefore, as I designed and developed my research, I drew from the expertise of others in my field, as well as from my experience as a teacher to affirm or identify the value in an experiential approach to learning about the body.

## Design of the Study

The research was comprised of four courses and two research studies. During my residence at Texas Woman's University (TWU) during the 2003-04 and 2004-05 academic years, I taught one semester of Introduction to Dance as an Art Form, a first-semester course for students new to TWU introducing somatics; Ballet II, a one-semester, intermediate-level course taught with a somatic approach, and I co-taught two semesters of Experiential Anatomy, a graduate-level course with Sarah Gamblin, Assistant Professor of dance at TWU. In addition, I conducted two research projects in biomechanics with Dr. Young-Hoo Kwon, looking at the kinematics of a specific movement from ballet: grand rond de jambe en l'air. In this dissertation, I will present data from these six projects as individual case studies, and then analyze the data collectively to address the question of how a dancer develops *knowing in the body*.

In the courses for the study, I developed a general model where specific anatomic information was presented followed by movement exploration focused on embodying the presented information. In setting up these courses, I was creating an environment for learning within a very specific environment. From an ethnographic perspective, knowledge is embodied in what Bourdieu (1977) termed the *habitus*: it is culturally distinct and discipline specific. As knowledge is socially constructed, the role of the learning environment and style of presentation play an important role in this process. Therefore, in designing the courses that contributed to the study, I considered both how the pedagogical approach would shape the dancers' experiences and how the learning

environment would shape the acceptance of the concepts and methods used in the courses.

As an example of this pedagogical approach, in the Experiential Anatomy course Sarah and I demonstrated that the anatomic and somatic information was complementary and could be naturally incorporated with dancing and learning to dance. In our teaching we “modeled” this information in our delivery of the information and development of the students’ experiences. In addition, as several of the students were also enrolled in Sarah’s Modern IV (advanced) class, the students witnessed how her pedagogy naturally embodied this complementary interface of anatomy, somatics, and movement. This integrated approach was important in helping the dancers synthesize the information and explorations we presented. We hoped the dancers would extend their initial engagement into a relationship with the information, each selecting and integrating what was most meaningful or applicable to her, and see how the information and experience presented in the Experiential Anatomy course also related to their work in technique class.

This approach would not have been entirely new to the students; even in the most codified dance environments, dancers intuitively work on their own to find “the feeling” in their bodies. What was new to the dancers was the label “somatic.” The purpose of this inquiry, however, was to observe, analyze, and describe how dancers make meaning of anatomic information through somatic exploration in a particular dance environment. I was interested in how work with anatomic information and somatic exploration might lead to a confidence or a way of knowing for a very specific population of dancers. Working within an environment that encouraged this approach, would the dancers learn

to apply the anatomic and somatic information they had been introduced to when they made choices or processed information about their bodies or their dancing in the future? And more particularly, how would they use this information? Would the students utilize this anatomic and somatic information within technique class or in performance, or would they only use this information as a frame of reference? Would the study and exploration of the body develop a confidence or knowing for the dancers? And if so, how would they apply this knowledge?

Thus, the current study explores how dancers translate and integrate detail and sensory information about the structure and function of their bodies, through movement exploration and in their dancing. In this research I ask how the body can be a site of knowledge and how this knowledge develops and emerges. Finally, I reflect on how this information has shaped (and re-shaped) my pedagogy.

Beyond this practical application of the research, there is also an important ideological shift that I hope to negotiate. My work exists between the seemingly separate beliefs and values that surround the art and science of dance; I hope to be able to articulate the richness of the epistemic space that joins these two perspectives. This fusion of the abstract and experiential, concrete and elusive, embodied and practical creates a vast landscape within which my work, as well as a new discourse on the art and science of dancing, can reside.

And, ultimately, what light will this research shed on teaching dance kinesiology? While this last question will indeed be an end product, the distillation of my research, it

also serves primarily to situate my questions within the larger framework of dance, bodily knowledge and the intersections of the scientific and artistic domains.

I advocate that all dancers benefit from the inclusion of anatomical information and exploration of this information as part of their training. Each individual makes her own meaning with this information, consciously or not, in her own body. Knowing in the body will be different for each individual dancer, and she may or may not find the language to communicate this verbally. Yet a *knowing* can be seen in a dancer's comfort and ease in negotiating the different demands of dance and in her confidence as a performer.

In the following pages, I detail the design of the courses used in the research, analyze the generated data and propose a theoretical perspective on how dancers come to know in their bodies. Chapter II outlines the research study, the methodology I used for analysis of the data and the steps I took to theorize about the findings. Chapters III - VI present the data from the various case studies. These data are organized to present themes that emerged from the dancers' journals and interviews. Chapter III focuses on the many worlds a dancer is working within, including the world of dance and the individual dancer's body. Chapter IV looks at the dancer's experience; Chapter V discusses movement as a context for knowing. Chapter VI presents various pedagogical approaches. Chapter VII presents four constructs that emerged from the data and introduces supporting literature in the development of a theoretical perspective. Chapter VIII provides the narrative of the theoretical perspective, and Chapter IX will serve to locate the theory generated from the data in the larger world of dance.

## CHAPTER II

### CREATING A WORLD FOR RESEARCH AND ANALYSIS

I began my research with an inquiry: What is the best way to teach kinesiology? As I probed and developed this question, I determined my question was predicated on many others. For example, in teaching kinesiology, what is the ultimate goal for introducing dancers to this information and why do they need to know it? If there is value in teaching or learning kinesiological information, it must contribute in some way to a dancer's performance. Specifically, does knowing more about one's body enhance dancing, and if so, how? How does anatomic information contribute to what a dancer "knows," and is this "knowing" only a cognitive understanding, or is this information embodied in their dancing? Does this knowledge develop in the dancers' bodies, and if so, do dancers *know* in their bodies?

In an effort to answer these questions, I set out to design a study that would allow me to observe the effects of presenting information about the body that the dancers could integrate with their dancing. I created three courses to allow me to inquire into the nature of the participants' experiences as well as factor in an awareness of the social milieu in which the dancers were working: Introduction to Dance as an Art Form, Ballet II and Experiential Anatomy. These courses were complemented with two studies in biomechanics, looking at grand rond de jambe en l'air.

By designing the three courses and two biomechanical studies as individual projects, I was able to collect data that reflected different research and pedagogical approaches and thus provided multiple sources of information. Grouping all of the research would then speak to the larger experience of how dancers “create knowledge in their bodies.”

A case study methodology allowed me to look in depth at each group and to integrate multiple sources of data. Each case study was bounded in 1) a specific location—the dance department at Texas Woman’s University (TWU), 2) time—including the length of the semester, frequency of meeting time and length of meeting time in each course and 3) range of experience—including dancers of different ages and educational status. The data sources in each case study included journals, class projects, questionnaires, videotape and mid-term and follow-up interviews. In order to systematically sort through all the data the studies generated, I employed a grounded theory methodology.

My primary orientation in the research was qualitative; I collected and analyzed qualitative data from the Introduction to Dance as an Art Form, Ballet II and the two Experiential Anatomy courses. The rond de jambe study generated both qualitative and quantitative data. The questionnaire and interview data from the rond de jambe studies was qualitative in nature, yet the kinematic data in these biomechanic studies was analyzed quantitatively. Therefore, I will begin with a discussion of qualitative methodology to provide a framework for the investigation, which includes information from the courses and questionnaire and interview data from the rond de jambe study.

This discussion includes a brief introduction to grounded theory, and is followed by an orientation to a quantitative research paradigm used in analysis of the kinematic data.

### Qualitative Research

A qualitative researcher is guided by philosophical tenets, or what Creswell calls “a basic set of beliefs or assumptions that guide inquiry” (1998, p. 74). These assumptions relate to the nature of reality (ontology), the relationship of the researcher to the subject or data she is studying (epistemology), the role of ethics and values (axiology) and the process of research (methodology). Studying things in their natural settings and attempting to interpret, rather than explain, phenomena, characterizes qualitative research. In general, qualitative researchers employ a host of different yet often interconnected methods to better understand the subjects they are studying. Rather than using prescribed tools, this approach allows a researcher to frame the research question from a number of perspectives. Therefore, the research methodology gives rise to, shapes and defines the research.

The data I collected in this research reveals as much about me—my questions and my ideas about shaping the studies—as it says about the experiences of the participants. Qualitative researchers know their interpretation is situated and value-laden; their history, gender, race, and class shape their perspective. Therefore, a researcher must be explicit about how meaning is constructed and how meaning is embodied in both “the language and actions of the social actors” (Schwandt, 1998, p. 222). In addition, as qualitative inquiry is querying the human condition, it is “inherently social and shaped by multiple ethical and political questions” (Denzin & Lincoln, 1998, p. 408). Finally, in utilizing a

qualitative methodology I was looking at the lived experiences of the dancers and developing a way to integrate very particular information—about the body, and about each individual dancer’s body—into each dancers’ understanding of their bodies, and ultimately into their dancing.

In developing the research framework, I began with both phenomenological and ethnographic orientations. A phenomenological methodology addresses the “lived experience” of the individual as well as the emergence of a phenomenon. My objective for this framework was:

To determine what an experience means for the persons who have had the experience and . . . provide a comprehensive description of it. From the individual descriptions, general or universal meanings are derived; in other words, the essences of structures of the experience. (Moustakas, 1994, p. 13)

However, I was aware that I was looking at a very particular social situation that required that I also bring an ethnographic lens to the framing of the individual studies. According to Creswell (1998), ethnography is “an exhaustive description and interpretation of a cultural group or social system” (p. 59). As the participants in my study were all members of the TWU Dance Department, they comprised a social system at a given period of time. As a member of the same community I was immersed in the day-to-day goings on, both as an observer, and as a participant. Using an ethnographic approach, the interview and observation data provided an emic, or insider’s perspective, as well a view from the outside, or an etic perspective. Employing an ethnographic focus I could clearly see that dancers were developing patterns of behavior in response to their participation in the dance department, specifically in the courses used in this study.

However, in the end I approached each course in the research as separate, but interrelated case studies, allowing me to focus on the ethnographic and phenomenologic aspects of each group. The analysis of the data however, required that I look at one more qualitative research tradition: grounded theory.

### *Grounded Theory*

Originally defined by Glaser and Strauss in the 1960's, grounded theory is less a specific method or technique, than a style of qualitative analysis to understand "process within the context the process was occurring in" (Morse and Field, 1995, p.157).

Grounded in data, grounded theory is concerned with "how participants create and respond to experiences" (Schreiber, 2001, p. 11). A grounded theory method of data analysis allowed me to identify themes in the data and to distill this information into a theoretical perspective. Using a grounded theory methodology to analyze the data, I have included phenomenologic and ethnographic data in each course as a case study and both qualitative and quantitative findings from the rond de jambe studies. The details of the grounded theory analysis will be explained in greater detail following the description of the individual case studies. However, prior to the presentation of the case studies, a brief overview of quantitative methodology is included to situate the rond de jambe studies.

### Quantitative Analysis

The empirical sciences aim to explore, describe, understand, and predict events in the world. Research is conducted in the pursuit of new knowledge, which is evidence based. Statements in the empirical sciences must be controlled by facts derived from experience. Based on objective reasoning, quantitative research is characterized by

experimentation, or what Chatfield (1999) calls “directed observation in a controlled setting with the aim of making statements about cause and effect experiments” (p. 133). Key aspects in scientific inquiry include discovering facts and constructing hypotheses or theories. Most research is conducted in a laboratory setting, and ultimately the purpose of theory in quantitative research is to predict and explain. Quantitative research includes use of statistical procedures to examine similarities and differences (Ponterotto, 2005, p. 128). While there are standard formats for conducting and reporting research that reflect widely accepted procedures, there is not one “scientific method,” but as Chatfield notes, “all scientific inquiry is problem solving” (1999, p. 125).

The rond de jambe studies were designed to observe pelvis motion in the execution of grand rond de jambe en l’air en dehors. In setting up the rond de jambe studies (2004 and 2005), I created hypotheses that guided the research design. The kinematic analysis, which was analyzed numerically, supported the hypotheses relative to the population I was studying.

### Design of the Case Studies

In this section I will describe the courses and the set up of the kinematic analysis studies. The courses included two graduate level courses in Experiential Anatomy, Ballet II (an intermediate level dance technique course taught with a somatic focus), and Introduction to Dance as an Art form (an undergraduate course designed for students in

their first semester at TWU). In addition, the research incorporated two kinematic studies of *grand rond de jambe en l'air* conducted in the TWU Biomechanics Department.<sup>1</sup>

These case studies will not be presented chronologically, but grouped to orient the reader to the different populations I was working with. Each study was approved by the TWU Institutional Review Board, and the approved consent forms for each study can be found in Appendix A. The six case studies are presented in the following table.

Table 1: Summary of Data Collected<sup>2</sup>

Case Study	Date	Participants in course	Participants in research	Data collected
Introduction to Dance as an Art Form	Fall semester 2004	22	10	Journal entries, mid-term interview, follow-up interview
Ballet II	Spring 2005	19	15	Journal entries, mid-term interview
Experiential Anatomy 2004	Spring 2004	6	6	Journal entries, mid-term interview, follow-up interview
Experiential Anatomy 2005	Spring 2005	10	10	Journal entries, mid-term interview, follow-up interview
Rond de jambe 2004	Spring 2004	N/A	10	Kinematic data, questionnaire
Rond de Jambe 2005	Spring 2005	N/A	15	Kinematic data, questionnaires pre and post-test, follow-up interview.

<sup>1</sup> See chapters III, IV and V for additional information about the delivery of the courses and biomechanic studies.

<sup>2</sup> Due to the overlap in the different case studies, the total number of participants in the dissertation was 51.

### *Introduction to Dance as an Art Form*

I designed the Introduction to Dance as an Art Form course to introduce somatic information to undergraduate dancers during their first semester at TWU. While the majority of students in this course were freshmen dance majors, there were several transfer students and two other students enrolled at TWU who were not dance majors.

The course met two days per week for ninety minutes each day in a large dance studio. Each time the course met, I introduced a concept focused on a particular part of the body, balanced by readings from Andrea Olson's *Body Stories*. We would discuss the reading as a group; the students would then stand up and move from the identified perspective (often a part of the body, such as the scapula). We finished each individual class with discussion and journal writing.

While the information presented in any given class was not difficult, many of the students found the set-up of the course challenging. Countering traditional models of dance training, I asked the dancers to temporarily set aside dance technique and come to know their bodies – through the exploration of movement. Dancers touched their own bodies, touched other bodies, and reflected on their bodies' capacities and limitations. Despite their initial discomfort, all dancers participated fully in the course, including submitting weekly journal entries, participating in mid-term discussions, and writing final "body stories."

As I was the teacher of record for this course, the following procedure for obtaining informed consent was used to prevent any perception, on the part of the students, of grade coercion. I explained the research component of the course at the

beginning of the semester and invited discussion about the research agenda. Next, I left the room, and a staff member in the department provided the students with consent forms. Each student was given the option to sign the consent form or simply return the blank form to the staff member. These forms were placed in a sealed envelope and were not released to me until after final grades had been turned in for the semester.

After grades had been turned in at the end of the semester, I learned that ten of the twenty-two students would participate in the research component. These students allowed me to copy their journals for data and participated in one follow up interview. Two dancers from the Introduction to Dance as an Art Form were also enrolled in Ballet II, and one participated in the 2005 rond de jambe study.

### *Ballet II*

While Introduction to Dance as an Art Form focused on introducing somatic principles to the dancers outside of a technique course, in the Ballet II course I integrated information about the body directly into the structure of a strongly codified technique at the intermediate level. This course met two days per week, ninety minutes per day. The text I used to complement the material presented was Valerie Greig's *Inside Ballet Technique*. There were nineteen students enrolled in the course.

In most ways, this course mirrored a typical ballet class. However, I focused each class around an anatomic or somatic concept. For example, I would begin by identifying a particular part of the body or a joint action on a demonstration skeleton, or I would ask dancers to sit on the floor to explore a concept. Alternatively, I would instruct the dancers to work with partners to explore a movement or a sensation. After establishing

this bodily focus, the dancers would go to the barre to begin the traditional sequence of pliés, tendus, and dégagés.

We always began the ballet barre exercises with the right hand on the barre, requiring the dancers to start working on the left side of the body instead of the right. This adaptation unsettled and confused the dancers at first – they had always started classes holding the barre with the left hand, and their *bodies* were accustomed to working the right side first. Nevertheless, I felt that the change was important for facilitating the other adaptations I would be making. After a brief time the dancers were able to integrate this reorientation. Moreover, through this minor adaptation, the dancers had the opportunity to learn material with the left side of their bodies. If nothing else, this change altered the dancers’ investment in the first few exercises, simply because they felt different when they worked their left sides first.

We finished dancing about five minutes before the end of each scheduled class so the dancers could write in their journals, usually in response to a very specific question. For example, after one class, the dancers responded to the following question. “After working with a partner in rond de jambe en l’air how did your body feel, and were you able to apply this sensation when working on your own?” All of the dancers participated in mid-term interviews so was able to ascertain their perceptions of the class, particularly how the anatomic or somatic information was influencing their dancing.

As I was the teacher of record for this course, I used same process to obtain informed consent as I used in Introduction to Dance as an Art Form. The dancers were informed of the nature of the research at the beginning of the semester, signed, or simply

turned in blank, consent forms under the supervision of a staff member while I was not present in the room. These forms were not provided to me until after the semester had concluded. By granting informed consent, the dancers allowed me to xerox their class journals and integrate notes from their mid-term interviews. Fifteen dancers from Ballet II participated in the research phase. One dancer from Ballet II was also enrolled in the 2005 Experiential Anatomy course. One dancer from Ballet II participated in the 2005 rond de jambe study.

#### *Experiential Anatomy 2004 and 2005*

Both semesters of Experiential Anatomy created an environment that was similar to Introduction to Dance as an Art Form: the dancers in these courses investigated the structure and functions of their bodies through physical exploration outside the structure of a dance technique course. However, this course was designed for graduate students. In addition, I co-taught this course with TWU dance professor, Sarah Gamblin. Having two professors teaching the class created a very different dynamic in the teaching of the material and provided the students with a more diverse learning experience (as compared to the two courses described previously). We used the same syllabus in 2004 and 2005, which determined the distribution of concepts and flow of topics for the semester. And, in both courses, we used Andrea Olson's *Body Stories*, Eric Franklin's *Dynamic Alignment through Imagery* and Callais-Germain's *Anatomy of Movement* as texts for the course.

The courses are initially presented as one to discuss the design of the course, but in the data analysis, they are treated as two different case studies. Treating these courses

as distinct case studies allows me to identify and differentiate social and environmental factors that would have shaped the dancers' experiences. And while the set-up for the two courses was the same, in the discussion that follows, I will note how the courses differed in their actual development.

The class met once a week on Friday mornings from 9:00 -11:15 in a large dance studio. The set-up of the course was to 1) discuss assigned readings and answer questions, 2) discuss the relevant anatomy and engage in some experiential activity, 3) write about the experiences in the activity, 4) reflect upon this information and integrate or explore new ideas that developed in movement, and 5) journal. In addition to the in-class writing, each dancer submitted a weekly journal entry following up on the information presented in the previous class.

Each student also participated in a mid-term interview. For each interview, I had prepared about 8 - 10 questions for follow up, based on re-reading the dancers' journals. During the interviews conducted in both years, in some instances I asked all of the questions and received answers. In other instances, I asked only one or two questions, but the discussion covered a wide range of topics, most introduced by the dancers. In 2004 each interview consisted of watching a short video clip from a previous class and discussing it. We also followed up on questions the dancers had posed in their journals prior to the interview. However, the majority of the interview focused on the dancers' questions, perceptions and new information they were processing in their bodies. In 2005, we did not watch video clips during the interviews, but focused on my questions as a point of departure for discussion. The dancers always had a lot they wanted to talk

about; while the dancers signed up for a 30-minute interview, most of our discussions lasted an hour.

Although the two Experiential Anatomy courses contained the same progression, material and similar exercises, with 10 students in 2005 as opposed to 6 in 2004, the 2005 class was different in several notable ways. There were several reasons for this. First, Sarah and I had taught the class previously, we had developed a clearer organization and focus in the presentation of the anatomical information and structure of the experiential exercises, and we included work with partners more frequently. The students in the 2005 course commented that the environment was conducive to experiencing and exploring how their bodies worked and how past experiences affected their dancing. For example, right before the mid-term break, we asked the dancers to write in-class journal entries about what they had been learning in the course, and then share these with their classmates. Demonstrating that each dancer had both questions and revelations about her body, this process of recording and then sharing their observations effectively synthesized the dancers into a community. In addition, in 2005 each dancer wrote a final essay for the course; this essay requirement was not included in 2004.

Four of the six dancers from the 2004 Experiential Anatomy course participated in follow-up interviews during May and June 2004, and two of these participants provided additional follow-up information during October 2005 and April 2006. Seven of the ten dancers from the 2005 Experiential Anatomy course participated in follow-up interviews in October and November 2005. In addition, two dancers from the 2004 Experiential Anatomy course participated in the 2004 rond de jambe study and were

joined by three dancers from the 2005 Experiential Anatomy course during the 2005 rond de jambe study.

As I was not the teacher of record for either of the Experiential Anatomy classes, I introduced the research project to the students on the first day and administered the consent forms. The research was based on each student's individual experiences, observed through her journal writing and mid-term interviews, and was augmented by observing videotapes of the weekly classes. All of the participants in the Experiential Anatomy courses participated in at least one follow up interview.

### *Rond de Jambe Studies*

Participants in the rond de jambe studies represented a cross section of dancers involved in the other courses used in the research. However these studies were bounded by the dancers' experience in ballet training (skilled and unskilled). In addition, the quantitative data from the rond de jambe studies represents some of the scientific, conceptual data the dancers were introduced to. In the first study, conducted in 2004, 10 dancers participated, completing grand rond de jambe en l'air at 45 degrees, and 90 degrees. In the second study, conducted in 2005, 15 dancers completed grand rond de jambe en l'air at 90 degrees, 105 degrees and at each dancer's maximum active range of motion (M-AROM) or fullest height. The testing provided a novel environment for the dancers in which to perform, and reflect on, what they *knew* in their bodies.

The two rond de jambe case studies were set up similarly; however, there were also some differences. Throughout this narrative I will identify how the studies differed. The participants were recruited from ballet classes in the dance department at TWU; in

2005, two dancers from Texas Ballet Theatre participated as well. I informed each dancer was informed about the benefits and risks of participating in the research prior to the testing, and each signed an informed consent form on the day of the testing. The testing took place in the Biomechanics Laboratory on the campus of TWU.

All participants in 2004 filled out a questionnaire prior to the study. In 2005, the dancers completed questionnaires prior to and following the testing. I also interviewed the 2005 participants during the summer following the testing. The participants observed both the video of the test and the 3-dimensional model that was created from the video data. The questionnaires and interviews produced qualitative data from these studies; however, the methodology that directed the research was quantitative. Therefore, a brief orientation to the research methodology used in the rond de jambe studies follows.

Quantitative analysis involves the identification of dependent and independent variables. In the rond de jambe study, the dependent variable was pelvis motion; this is the variable I was observing in the experiment. The independent variable was the change in conditions: the increased height of the leg from 45 degrees to 90 degrees in 2004, and from 90 degrees, to 105 degrees to each dancer's maximal active range of motion in 2005. The test design included placing reflective markers on the participants' bodies to identify the ankle, knee and hip joints, the anterior superior iliac spine in the pelvis and acromion processes in the trunk. Motion data was captured using six digital video recorders.<sup>3</sup> I asked the dancers to warm up for a minimum of 5 minutes prior to testing,

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<sup>3</sup> See Wilson, Lim & Kwon (2004), Appendix B.

and encouraged them to keep moving between trials. Each dancer completed a minimum of two trials per angle condition.

Each trial lasted for twelve counts, eight counts for the full grand rond de jambe en l'air and four counts for a relevé and lowering at the end. In 2004, the dancers performed the rond de jambe phrase to a metronome, but in 2005, the dancers performed the test with musical accompaniment. I selected one trial from each height for analysis. Criteria for trial selection included moving the leg smoothly, maintaining balance, minimizing counter movement in the body, and synchronizing with the music.

The dancers were given feedback regarding the height of the leg in an effort to control the independent variable. In the case of the 105-degree measure, each dancer's leg length was measured and a target was established for each dancer to aim for with her leg. The test set-up test created a standardized environment where the effect of the leg height on the motion of the pelvis was measured. Standardization of the measurement technique was important for internal validity.

Although kinematic data is primarily descriptive, the data can be combined for statistical and pattern analysis. In this particular study, the video data was transformed into a 3-dimensional model, the movement was divided into set events, numerical representation of the data was converted into graphs, and statistical analysis of the differences between the testing conditions was made. The publication that contains kinematic data for the 2004 rond de jambe study and the manuscript for the 2005 study are both included in Appendix B.

## Using Grounded Theory for Data Analysis

In using Grounded Theory, I am influenced by Charmaz's (2000) constructivist approach to using this methodology, originally conceived by Glaser and Strauss (1967) and refined by Strauss and Corbin (1998). Charmaz notes that grounded theory allows researchers to look at slices of life as they can "portray moments in time" (p. 522). As Charmaz writes:

Grounded theory offers a set of flexible strategies, not rigid prescriptions (p. 513). [Furthermore], a constructivist approach recognizes that the categories, concepts and theoretical level of an analysis emerge from the researcher's interactions with the field and questions about the data, one that does not seek a single truth, but addresses human realities and assumes the existence of real worlds. (p. 522)

Finally, a constructivist approach celebrates the incorporation of multiple social realities, recognizes the co-creation of knowledge by the viewer and the viewed and aims toward interpretive (rather than analytical) understanding of the subjects' meanings.

To summarize, a constructivist approach to grounded theory 1) studies people in their natural surroundings, 2) focuses on meaning that furthers interpretive understanding and 3) adopts grounded theory approach without a positivist stance. Using a feminist approach to data collection, which is less formal than quantitative research methodologies, more immediate and in which subjects' concerns take precedence over the researcher's questions, the narratives allow "emotions to surface, doubts to be expressed, and relationships with subjects to grow" (p. 523). Finally, Charmaz writes that a constructivist approach "fosters our self-consciousness about what we attribute to

our subjects and how, when and why researchers portray these definitions as real.” (p. 523).

### *Coding and Portraiture*

The rigor of grounded theory is based on clear guidelines “from which to build explanatory frameworks that specify relationships among concepts” (Charmaz, 2000 p. 510). Data analysis is characterized by coding at four different stages. First level coding, or open coding allows the researcher to form initial categories of information (Creswell, 1998, p. 57). Second level, or axial, coding reconfigures the data to reveal categories. Level three, or selective, coding, creates a story from the emerging categories, and level four, or theoretical coding, looks at the interface of the data with what is known in the field. The following table outlines the different coding performed in each case study, and each level of coding is explained in the narrative that follows.

Table 2: Summary of Coding and Data Treatment for Courses

	Journal	Mid-term Interview	Follow-up Interview	Follow-up Interview	Level 1 Line-Coding	Level 2 Axial Coding	Level 3 Selective Coding
Introduction to Dance as an Art Form	XX	XX	XX		By group	By group	By group
Ballet II	XX	XX			Individual and group	By group	By group
Experiential Anatomy 2004 *	XX			June 2005, October 2005, April 2006	Individual and group	Individual and group	Individual and group
Experiential Anatomy 2005				October and November 2005	Individual and group	Individual and group	Individual and group: between group

\* Theoretical coding performed with two participants from this course

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Table 3: Summary of Coding and Data Treatment for Rond de Jambe Studies

	Pre-test questionnaire	Post-test questionnaire	Follow-up Interview	Line-by-Line Coding	Axial Coding	Selective Coding
Rond de Jambe 2004		XX		By group	By group	By group
Rond de Jambe 2005	XX	XX	June 2005	By group	By group	By group

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Level one, or open coding, can be conducted in a sentence, paragraph, or by following the guidelines established by Strauss and Corbin, line by line. This process breaks down the data and allows the researcher to define conceptual categories that arise in the data. These codes reveal both the language and imagery of the data, or what Strauss and Corbin (1998) described as the “way in which connections were made between a category and its subcategories” (p.124).

I grouped the data from the Introduction to Dance as an Art Form class (journals and follow-up interview information). The journals and follow-up interviews were all prompted by similar questions; therefore, the answers in both the dancers’ journals and my presentation of the data were arranged topically. General themes that emerged from these documents included attention and intention, choice, focus, breath, emotion, touch and specific questions or references to pain or injury.

I also grouped the questionnaire data and follow-up interviews from the rond de jambe studies. In both 2004 and 2005 common themes in the questionnaire data focused on strength and flexibility, technique, extension or range of motion, the set-up of the study, full body movement, weight shifts and turnout. In 2005, the line-by-line coding also identified themes that related to specific concerns with injury or asymmetry in the body, comments the dancers had received and feedback they had relied on, and entries detailing how each dancer's internal sense matched or did not match feedback she was getting from the outside.

I coded the journal entries for both of the Experiential Anatomy courses and interview data first by individual, then grouped by week, and then by course. I also coded the journals and interview transcripts with line-by-line coding. Initially, the 2004 and 2005 data was kept separate through open and axial coding. The following themes were revealed after the 2004 Experiential Anatomy mid-term interviews: 1) Alignment, 2) Is knowledge good?, 3) Pain: what am I doing wrong?, 4) Breath, 5) Images, 6) A little knowledge is dangerous, and 7) Challenging assumptions about technique. The 2005 mid-term interview data revealed 1) Comparison of previous training to current training, 2) Previous study in anatomy, 3) Pain, 4) Imagery, 5) Breath, 6) Alignment, 7) Bone v. muscle, 8) Certainty v. uncertainty, 9) Is my body right?, 10) Movement translates the concept, 11) Reflecting on learning preferences, and 12) Romanticizing the process. The follow-up interviews for both groups were also coded in this open manner.

Level two, or axial, coding requires a reconfiguration of data to reveal concepts and categories (McCann and Clark, 2003a, p. 13). The concepts are clustered into

categories and the data moves to a more abstract and more concentrated form. This coding was applied to all of the level one data from all of the different classes, and included the rond de jambe questionnaire data. The level two coding summaries were sent out to my committee members for feedback.

Level three, or selective, coding was used to identify a story line that links information across and between categories. Selective coding takes the initial codes that frequently appear to sort large amounts of data and link them together to form an overarching category. This coding is more conceptual and more directed than the line-by-line coding but will organize and categorize the data (Charmaz, 2000, p. 516). In creating the selective coding, I utilized the feedback from my committee regarding the axial coding to configure larger themes for analysis.

In the development of the data chapters, I chose a method for summarizing some of the data I collected that lies outside of a grounded theory tradition, but that resembles selective coding. I developed narratives of the data based on the work of Sara Lawrence-Lightfoot and Jessica Davis, which they call portraits. As Lawrence-Lightfoot and Davis (1977) write, "Portraiture seeks to capture the complexity, dynamics and subtlety of human experience" (p. 2).

Portraits offer a discerning, deliberative process, "searching for the story line that emerges from the material. However, there is never a single story; many could be told" (Lightfoot-Lawrence & Davis, p. 10). A portrait is evaluated based on what Eisner refers to as referential adequacy, "testing the criticism against the phenomena it seeks to describe, interpret and evaluate" (Quoted in Lawrence-Lightfoot & Davis, p. 246).

Meaning is thus co-constructed between the artist and the observer; the researcher and the researched.

Theoretical coding, or level four coding, asks the researcher to “perceive the data theoretically rather than descriptively” (McCann & Clark, 2003a, p. 12). Theoretical coding balances the data with the researcher’s knowledge of the field. This technique enables the data to be situated into a meaningful whole (McCann & Clark, 2003a, p. 13).

In the theoretical coding phase, I brought forward all of the axial and selective coding that had been sorted into larger themes – themes that had emerged from the coding and sorting of the data. This information was then divided into four sections. The first section defined the elements of the dancers’ environments. These elements include 1) balancing internal and external information, 2) dealing with conflicting information, 3) the individual versus the field of dance, 4) ideologies of dance, 5) specific versus global experiences, 6) positive and negative aspects of thinking about the body, 7) cultural or environmental support for the work, and 8) points of interface or intersection.

The second section of theoretical coding revealed how the dancers’ perspectives and experiences changed over time. This information revealed how the dancers were attending to change, how they integrated the anatomic and somatic information, their confidence and familiarity with the material, the importance of taking/making time. The third section included what the dancers trusted, their perspectives, emotions and experiences. The fourth section of theoretical coding looked at pedagogy, both mine and that of the students involved in the study.

## *Memoing*

Throughout the entire research process, reflective comments and observations served as my reflexive narrative with the data. Because grounded theory researchers function as the instrument for data collection, grounded theory requires constant reflection “to enable researchers to serve as filters for interpretation of the data” (Mallory, 2001, p. 89). This “informed speculation” recognizes that a researcher’s ideas about her values and beliefs may differ from, or be similar to, the participants’ values and beliefs. In grounded theory constant reflection is necessary and is embedded in the design.

As defined by McCann and Clark (2003a), memoing is the researcher’s dialogue with the data; “it is both inductive and deductive and allows the researcher to deal with any preconceptions she has about the study” (p. 15). Memoing allows the researcher to conceptualize the data, while at the same time sort the information into categories and subcategories. By writing about the data, seen as a composite, memo writing can help direct the researcher toward more data collection and theoretical sampling. According to Charmaz (2000), “through memo writing, we elaborate processes, assumptions, and actions that are subsumed under our codes. Memo writing leads us to explore our codes...thus our codes take on substance as well as a structure for sorting data” (p. 517). Memo writing helps the researcher see the connections between the categories and conceptualize how the categories that they develop from the data fit into larger categories.

### *Core Category*

The core category synthesizes the information from the subcategories from which it was generated. As McCann & Clark explain, “A core category begins to emerge only after constant comparative analysis with the data, questioning and analytical thinking” (2003a, p. 14). A core category that emerges through this process must be broad in range and able to integrate with other categories. It should be general, appear frequently in the data, and help synthesize or explain the findings.

I sorted and re-sorted the data numerous times to develop a core category in this research. Seven themes emerged from the reconfiguration of the theoretical coding. These themes included 1) balancing dualities or perceived binaries, 2) identifying and understanding points of intersection and the synergistic effect of being in the class, 3) finding a context for applying the information, 4) understanding the information the dancers received from their bodies, 5) noting how the class goals shaped the pedagogy and the research, 6) noting how the dancers’ experiences shaped the pedagogy and the research, and 7) acknowledging the effect of time spent and social support for the research. Through continual comparison with the raw data, and frequent memoing, core categories were distilled down into four constructs. These constructs include the following: 1) Dancers learn to balance diverse information and dualities. 2) Attention is immediate; integration, retention and knowing develop *over time*. 3) Dancers find application of the information in intersections. 4) Dancers acquire the skill of moving on individual basis.

### *Theoretical Sampling and Development of Theory*

Theoretical sampling is another unique attribute of grounded theory. After the initial sorting, coding and memoing, a structure develops that reveals the depth and breadth of the collected data, but it also reveals the gaps and holes. At this point the researcher can return to the field to address specific issues to further exemplify the developing theory. When the researcher collects new data to “compare emerging categories and establish conceptual boundaries” (McCann & Clark, 2003b, p. 15), theoretical sampling takes place. Theoretical sampling is a key for moving toward the development of theory. It demands that researchers have compared “data with data and have developed a provisional set of relevant categories for explaining our data” (Charmaz, 2000, p. 519). Furthermore, this technique helps define the properties of the categories, determining how and when the concepts are sufficient to “specify conditions under which they arise, are maintained, and vary; and to discover their consequences” (Charmaz, p. 519). Theoretical sampling looks for consistency in the data as the data is used to describe the phenomenon.

I conducted theoretical sampling of the final follow-up interviews with two of the participants from the 2004 Experiential Anatomy course and with my co-teacher, Sarah Gamblin. These final interviews provided an opportunity to place the research into context. The questions for these interviews focused on the core concepts that had emerged in the data.

Finally, while a preliminary review of the literature is necessary to frame the study and guide the researcher in the development of questions, more extensive

integration of the literature comes at the end of the research, which links the concepts to theory. By limiting the in-depth research to the end of the data collection, the researcher avoids sensitizing the data with other theoretical perspectives. The literature also serves as an additional source of data, and a means of theoretical sampling; it gives a context for the data and plays an important role in validating the theory (Strauss & Corbin, 1998, p. 53).

### *Research Credibility*

In all aspects of research, viability and credibility must be established utilizing consistent and ethical procedures. Terms that describe verification in quantitative research are validity, reliability and objectivity. In qualitative research the guiding questions are focused on “trustworthiness and authenticity” (Guba & Lincoln, 1998, p. 210). Trustworthiness addresses the “confirmability of the data,” so that the researcher’s bias is eliminated from the analysis. Creswell (1998) offers eight verification procedures that check for “misinformation that stems from distortions introduced by the researcher [or the participants]” (p. 201). Creswell recommends at least two of these procedures be utilized in any given study. Of the eight presented, I will discuss the five that apply to this study: prolonged engagement and persistent observation, triangulation, peer review, clarifying researcher bias, and rich, thick description.

Creswell writes that prolonged engagement includes “building trust with the participants, learning the culture... and making decisions about what is salient to the study” (p. 201). In each of the courses taught, I interacted with the students throughout the semester. I collected journal data weekly in each of the courses used in the study, and

interviewed all dancers in the courses at mid-term. The students involved with the research participated in at least one follow-up interview. I also maintained contact with many of the participants following the courses in the follow-up interviews and through their participation in the rond de jambe study. Transcripts from all recorded interviews were typed and submitted to the individual dancers for review and comment. Even though the transcripts were typed verbatim, often the dancers' felt they had not made their intentions clear in their choice of phrase or words. Many participants returned the transcripts with clarification. In addition, in reviewing transcripts of the interviews, the dancers were given an opportunity to reflect on their experiences further. Two of the dancers discussed the transcripts with me at a later date.

In addition, as I was a student at the same institution during this same time, I interacted with some of the participants in my study in courses outside of the research framework. This allowed me to keep my emic perspective, as a member of the dance community I was studying. Furthermore, I was able to participate in several classes with the participants in my study as a fellow student; thus I could integrate the experience of being a student at the same institution into my analysis.

The breadth of data in the study afforded the opportunity for triangulation as a means for establishing research credibility. Triangulation refers to data gathering from multiple sources, methods and investigators (Creswell, p. 202). The courses were taught to two different populations: graduate students and undergraduate students. The material was presented as a stand-alone subject in the Experiential Anatomy and Introduction to Dance as an Art Form course, but it was integrated specifically with dance technique in

Ballet II. In addition, for the Experiential Anatomy courses, there were two instructors offering their individual perspectives to the development and delivery of the material. Furthermore, in the biomechanics study I used both qualitative and quantitative methods for the data collection and analysis. The qualitative data shed light on the dancers' experiences, while the quantitative data describes the kinematic response the dancers had to the testing requirements. In addition the rond de jambe data was drawn from an environment outside of the dance department.

The third criterion is peer review. Peer review took place on two levels. First, in the follow-up interviews, the participants discussed journal entries as a means for clarifying or expanding upon their responses. I provided transcripts of the interviews to the participants for verification and clarification. Secondly, as the axial data was coded and re-assembled, I sent drafts of these documents to my committee members for review and comment. Their comments served to acknowledge my impressions of the data.

The fourth criterion is researcher reflexivity. Researcher bias was made clear in two coursework documents,<sup>4</sup> in the researcher's journal, in planning meetings for the Experiential Anatomy course taught with Sarah Gamblin and in memos on the data. Finally rich, thick description of the data came from coding, memoing and the creation of portraits used to present data in a descriptive, rather than a reductive fashion.

Finally, in evaluating grounded theory, the theory developed must adhere to the following criteria: fit, work, relevance and modifiability. As Charmaz writes, the

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<sup>4</sup> "When Outside Becomes Inside," final paper for DNCE 6023 Critical Analysis of Professional Literature, May, 2004, and "The Body as Schema," final Paper for DNCE 6113 Fieldwork Methods, May 2005.

theoretical categories develop from the data and must fit them. “They must explain the data they subsume. Grounded theory must provide a useful conceptual rendering and ordering of the data that explains the studied phenomenon” (p. 511). An evaluation of the theory will be presented in Chapter IX as the theory is applied to pedagogy.

### *Theorizing About the Data*

In theorizing about the data, I am aided by Deleuze and Guattari (1994), who, in their definition of philosophy, create a context for how theory develops.

Philosophy presents three elements ... the pre-philosophical plane it must lay out (immanence), the persona or personae who must bring it to life and the philosophical concepts it must create (consistency) (p. 76). The three have incommensurable relationships....they continually pass from one to the other, support one another.....a concept like knowledge has meaning only in relation to an image of a thought to which it refers and to a conceptual persona that it needs.” (p. 78-81).

Theorizing exists in the concepts and in the plane of immanence from which the concepts emerge, but the theoretical development requires the embodiment of the concepts for the transition to theory. In theorizing about the development of *knowing in the body*, I will bring forth the concepts that emerged from this inquiry. These concepts are important to understanding how students utilize information about their bodies as they sense and perceive their bodies moving.

### Concluding Comments

At this point it is necessary to bring forward two aspects of the research that will form an important part of the discussion and the development of the theory: 1) the reciprocity of pedagogy and research and 2) an acknowledgement of the factors that influenced the formulation of the research, the pedagogy and thus the theoretical

perspective. As pertains to the first, it was clear that the teaching and the research complemented one another. The design of the courses used in the research and the methodology for conducting the research developed in tandem. My original question in designing the individual studies was concerned with understanding “the best ways” to teach about the body, thus pedagogy was the point of entry for the research. The research agenda shaped the teaching of the courses, and the research, with its focus on inquiry and understanding, had a profound influence on my teaching. And yet my teaching, a skill I have developed over twenty years, shapes my perspective on how I believe students learn, or come to know in their bodies. I feel that the symbiotic nature of this relationship between the research and the pedagogy is an important consideration for understanding the theory generated from this data.

Secondly, in Chapter VII, I develop a theoretical perspective of “Bodies-in-the-World,” based on information from ecological affordance, embodied cognition and phenomenology. While I did not apply these theoretical perspectives to interpret the data until after I had completed all of the analysis, I had been researching this information from the beginning of my doctoral studies.

We enter into research with assumptions and certain understandings of how we see the world, and yet how we see the world is shaped by our experience in it. My experience working with both qualitative and quantitative epistemologies required that I cast a wide net for presenting my understanding of the world (ontological orientation) as well as my understanding of the epistemological foundations of knowledge construction.

It is clear that this ontology and epistemology are both embodied and grounded in my interactions with the world.

## CHAPTER III

### A DANCER'S BODY IN THE WORLD OF DANCE: IDEOLOGIES, CHALLENGES, AND EPISTEMOLOGIES

In this chapter, I present images of the framework of the research, the worlds in which the dancers were participating, dancers attending to their bodies, and the venues within which the dancers were applying the information, and experiences they received during their participation in the study. The participant's ideals and expectations about dance and dancing have created a particular understanding for the dancers, including the forms the dancers are studying, as well as an understanding of the body, and their individual bodies.

The dancers in this study were asked to process anatomic and somatic information about their bodies as well as reflect on this process. The anatomic and somatic information provided a new bodily perspective for the dancers through which they could reflect on their training, integrate the information about their bodies with their dancing, and reflect on their perceptions of past injuries and alignment. In this way the dancers were coming to understand their epistemologic frameworks as well.

In this first section, guided by my interpretation of the dancers' experiences and responses, I present several worlds: I discuss the larger field of dance as representative of the ideal that many of the dancers aspire to. I also describe the dance department at

Texas Woman's University (TWU), and present the individual dancer's responses to the courses and the presented material.

### Dancing in Many Worlds

When an individual chooses to become a dancer, she must investigate, navigate, and negotiate the territory of what it means to enter into the field of dance. There are different styles of dance and different levels at which one can pursue dancing. In addition, wide ranging perceptions about the body vary with given aesthetic standards. These standards clarify specific methods for dancers of developing their physical bodies, yet also influence each individual's dancer's discernment of his or her body. Furthermore, within any style of dance, there is a system of preparing and developing the dancer that has as its focal point the attainment of a particular way of moving, and hence a *shaping* of the body.

#### *A Body in the World of Dance: A Discipline of Shaped Bodies*

Some dance techniques nurture the development of an "ideal" body. For example, the requirements for becoming a ballet dancer are based on physical exceptionalism and a capacity for bodily adaptation. Long and lean limbs, which facilitate a full range of motion, are ideal components of the ballet aesthetic, in tandem with lightness and ethereal agility. While this emphasis on a specific body has traditionally been attributed to classical and contemporary ballet, many dancers aspire to work in other genres in which clear archetypes exist, both in the movement style and vocabulary, and which are specific to the training the dancers pursue. For example, many forms of

modern dance require development of strength and stability to support the aesthetic of sharing another body's weight.

While some dancers are drawn to a particular style of dancing because of their bodily configuration or physical potential, for others, the physical ideal can be a struggle or seem like an unattainable goal. How closely do the dancers need to match the physical requirements of the form and how are individual bodies accommodated... bodies with differing shapes, flexibility or strength? As dancers pursue study or performance in a given genre, how do their bodies facilitate or inhibit this quest for this ideal? And in the pursuit of a particular body, are the dancers' discovering their own bodies, or striving to pattern their development after an ideal body? Yet within different genres of dance, and programs for training in dance, there is variety in the type of body which is being created.

#### *Dance at TWU*

The dance program at TWU has a strong commitment to training dancers with an emphasis on each individual student's artistic agency. The anchor of the dance curriculum at TWU is a somatic approach to movement and performance process; personal movement investigation and meaning making shape and focus daily technique class, choreography, and pedagogy. At the undergraduate level, an open admission policy reflects TWU's ideology of embracing diversity, including diversity of body types. Students in the dance program at TWU come from a variety of social, economic, geographic and dance backgrounds.

Students in the graduate program, which offers Master of Arts, Master of Fine Arts and Doctor of Philosophy degrees, are admitted via audition; only a small

percentage of these dancers are awarded graduate assistantships. As dance majors, the students at TWU, and thus the participants in this study, had embarked on professional training in preparation to enter the larger world of dance.

The courses included in this study (Experiential Anatomy, Introduction to Dance as an Art Form and Ballet II) all taught with a somatic focus) supported the department's vision of personal movement investigation and meaning making. Reciprocally, the goals of the dance program helped facilitate successful class experiences. In each of the courses used in this study, the focus was on the body. In teaching the courses, I expected the students to discover something about their bodies, to attend to discoveries about their bodies and utilize this information and experience in their development as dancers. In particular, I hoped that the students would develop an understanding of their physical bodies, and that this understanding would augment and enrich their technical training.

The environment for each of the courses was relaxed. Dancers sat on the floor for the lecture and discussion as opposed to sitting in desks. Following the presentation of information, such as names of bony landmarks or joint actions, the dancers explored this new information through movement. Working alone and/or with partners, the dancers developed both a sense of their bodies and their partners' bodies. Familiarity in the environment facilitated the development of trust; the students soon became comfortable working with one another and in all of the courses, there was the establishment of "a class experience." The students quickly came to understand the set up and design of these courses and adjusted to the expectation of being in a dance environment with a primary focus on the body.

### *The Dancers and the Courses*

In this section I will introduce the three courses taught in the research, Introduction to Dance as an Art Form, Ballet II taught with a somatic focus, and Experiential Anatomy. Each course was distinct in nature: Introduction to Dance as an Art Form, and Ballet II were primarily taught to undergraduate students. The Experiential Anatomy classes however, were geared to the graduate students in the program at TWU.

While the purpose of the Introduction to Dance as an Art Form course during the fall 2004 semester was to ask the dancers to think more broadly about the discipline of dance, it also introduced a somatic or body-oriented focus for thinking about dance training. Most of the undergraduate students enrolled at TWU arrived with backgrounds in jazz and ballet, as well as experience with drill team. Coming into the program, many of the students' perceptions of the field of dance in the Introduction to Dance as an Art Form course may have been shaped by study of only one of these dance forms. Few of these freshman students had studied modern dance or improvisation before coming to TWU and most of them quickly realized that these forms required different physical abilities and strengths than they had previously developed.

The students enrolled in Ballet II, an intermediate level course for sophomores and juniors, represented a wide range of experiences and technical abilities. Most of the students had completed at least one year of ballet training at TWU, but many had studied ballet before college. Some of the students in this course believed they were modern dancers taking ballet for one of two reasons: either to develop strength and base

technique or to fulfill a requirement for graduation. However, during the spring 2005 semester, the course also had an anatomic and somatic focus.

The Experiential Anatomy courses were offered to graduate students in the spring semesters and most of the Master of Arts (MA) or Master of Fine Arts (MFA) students took it during their first year of residence at TWU. The students in these courses had varied dance backgrounds, mostly in ballet and modern dance, however, also ranged from an MA student who worked primarily with drill team to an MFA student who had performed professionally for several years. Students in this course also noted that the styles of dance they had previously studied had fashioned their perceptions of how the body should take shape and function.

Specifically, the dancers' perspective had been shaped by what they had accepted about their bodies from previous dance experiences. This perspective was also influenced by the dancers' perceptions of their abilities to perform certain skills or movements and included reflection upon how they negotiated physical and aesthetic challenges. However, the Experiential Anatomy course gave the dancers an opportunity to put their training into perspective. Several of the dancers felt that the Experiential Anatomy course helped them understand and begin to master elements of ballet technique. One of the dancers also noted that understanding her body allowed her more freedom and confidence in her modern dance course. Another revealed that she had begun to understand dance from a bodily perspective (Summary, Follow-up Interviews).

In the 2005 Experiential Anatomy course, many of the dancers were also taking Modern IV, taught by Sarah Gamblin, the co-teacher for the Experiential Anatomy

course. Modern IV is the highest level of technique at TWU and is reserved for graduate students and accomplished undergraduates by invitation. Sarah uses anatomical language and initiates movement from specific body parts as part of her artistic vision; this approach obviously enhanced and augmented the information students were receiving in Experiential Anatomy. While it was not necessarily Sarah's goal for the technique course to link with the Experiential Anatomy material, many of the dancers commented on the complementary balance of information between the two courses. For the students taking both courses simultaneously, it was a very successful experience (Summary, Follow-up Interviews).

There were specific applications for some of the students as well. Molly, new to ballet when she came to TWU, discussed struggling with her confidence in this genre. In an interview conducted the semester following Experiential Anatomy, she discussed physical limitations that hindered her, particularly in ballet; she attributed these limitations to the difficulty she found in studying this dance form. However, she noted that the information she received from the Experiential Anatomy course, balanced with the somatic approach used in Ballet II, helped her feel more comfortable and competent in the ballet course (Follow-up Interview, 10/24/05). Yet some of the dancers were also reflecting on other dance forms while studying Experiential Anatomy.

Like many of the undergraduate dancers at TWU, Gayanne, a graduate student in the MA program, came to dance via drill team, a precision jazz dance style that includes dancers of all abilities and backgrounds. Gayanne's previous drill team experience provided an interesting context for being at TWU and in the Experiential Anatomy

course. During the course Gayanne began to question the uniformity and conformity of drill team and to ask where the individual could exist in such an organization. She spoke on several occasions about having to compensate for differences in body types and abilities when working with these dancers. Reflecting on this, she began to question if there should be variation in what is considered correct or right in movement, stating that “Being different doesn’t mean you are doing it wrong” (Follow-up Interview, 12/15/05).

### Dancers Attending to Their Bodies

In each of the courses used in this study, the students spent time looking at a skeleton. Presumably a representation of normative structural alignment, this model provided a codified arrangement of bones (and therefore muscles). In presenting the anatomic and somatic information to the students, the goal was to establish a common image and language with which students could better understand the structure and function of their bodies.

The dancers knew, or had come to realize, they had control over developing flexibility and strength. But structural components, such as the shape of their legs and feet, or the structure of the pelvis, could not be changed. And while it was not the intent of the courses to have the dancers reflect on the fit or match of their bodies to the styles of dance they were studying, this seemed an inevitable consequence of their participation in the study.

It was clear for some of the dancers that the skeletal model represented yet another way of measuring themselves to an ideal. Chloe, a student in the 2004 Experiential Anatomy course, commented that her goal was to perform dance correctly,

but she felt her body prevented her from doing so. She wondered why she had been successful as a dancer when she saw her structure as a mismatch for the scientific/artistic models she had been exposed to. Chloe went on to discuss that when performing the movement correctly, she got conflicting information. She knows there was a “mismatch between her performance and [her perception of] the ideal.” Often as she tried to conform to this ideal she experienced pain in her body (Journal Entry, Experiential Anatomy, 04/11/04). Another dancer noted that she was focused on making the movements look right, she wanted to look good doing the movement, but she had not previously considered how her skeletal structure facilitated or inhibited her success (Summary, Journal Entries, Experiential Anatomy, 2004).

*Anatomy and Aesthetics: A Productive Pas de Deux?*

One of the questions I had when first embarking upon this research asked if the embodiment of anatomical information would enhance the artistry of the dancers’ performance. Following my data collection and analysis, I would add an expanded query to my original question: Does understanding the anatomic and somatic information prepare us for the aesthetic demands of the dance world?

In this section, the study of anatomy and somatic exploration is viewed in light of aesthetic demands in dance. The questions in this section point to larger issues about the use of the body in dance. What is acceptable artistically is not always safe anatomically; however can the ranges of what is acceptable, in terms of balanced anatomical structure, support the aesthetic of dance? Is it useful or counterproductive to study the body in preparation for becoming a dance artist?

An understanding of anatomical structure for the individual dancer may keep her from incurring injury. However, are there physical conditions that should prevent dancers from dancing? Does dancing with a “flat” foot or overdeveloped but weak arch predispose a dancer to sustain an injury? While none of the students in any of the courses were physically impaired in any way – they all had strong and balanced bodies – one thing they learned within the courses was that within the normal anatomical model, there was room for individuality.

Throughout the semester in the Experiential Anatomy courses, several of the dancers acknowledged variation in their bodies – not as limitations, but as acceptable differences. For example, following discussion, analysis, and exploration of the structure and function of the foot during the class, the individual dancers’ reflected on the configuration of their feet. The question of ideal foot shape arose after a discussion of how the arch of the foot moves from a mobile position to a stable position in the transition from pointing (plantar flexion) to a flexed position (dorsi flexion), particularly in weight bearing.<sup>5</sup>

Two of the dancers wrestled with the fact that their feet were viewed as ideal for some of the dance styles they were pursuing, yet they were unconvinced that they could find a way to work within other aesthetics based on their foot structures (as if that were the only determinant of their success). These dancers could not see beyond the visual image of the foot’s shape to its function; for example, a flat foot provides better mobility

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<sup>5</sup> In *Dynamic Alignment through Imagery* (1996), Eric Franklin presents a model and metaphor to explain the relationships between the longitudinal and horizontal arches in the foot. See p. 179-181.

and support. Janelle wrote, “My mind has been on [our] discussion of feet – flat or arched – tendencies of stability preferences [high arch v. flat foot]” (Journal Entry, *Experiential Anatomy*, 03/04/05). Molly, who saw her foot as poorly designed for dance, mused about a comment she had received, indicating she had “a good plié foot” (Journal Entry, *Experiential Anatomy*, 03/02/05).

In dance programs, emphasizing a particular style of dance, the specific style will dictate movement preferences and anatomic ideals that are preferred by the programs. Where there is a mismatch between the student and the ideal (too high an arch, too much emphasis on turnout, or too little) there is confusion and ideologic contention between the faculty and students. In this particular study, as it pertained to strength, range of motion and turnout, all the dancers could see where their bodies were successfully or poorly designed for the dance idioms they had studied or were currently studying. Some were challenging peers’ or faculty members’ assumptions about the body as they tried to understand how their bodies matched up to the aesthetic of the forms they were studying.

*(Mis)Understanding the Shape of Her Legs*

While certain anatomic variations are undesirable, others, such as hyper-extended knees (*genu recurvatum*), are favored in classical ballet. In addition, ballet emphasizes flexible legs and spines; modern dance requires more upper body strength; and tap dancing requires mobile ankle joints. While these all seem to be desirable anatomic components—particularly as they relate to mobility in the hip joint, shoulder joint, spine and feet—are these attributes absolute or do they define a myriad of possibilities for moving? In a preliminary analysis of the data (axial coding summaries), one of my

dissertation committee members asked, “How do we celebrate the possibilities of moving with bowed legs”? (Linda Caldwell, Personal Communication, 12/15/05)<sup>6</sup>

One of the dancers in the 2005 Experiential Anatomy course discovered that her legs were shaped differently than she had originally realized. Throughout the semester, Marta discovered that her medial condyle was taller than the lateral causing a condition called knock knees.<sup>7</sup> This realization put into context the pain she had been experiencing in her knees, pain that developed from a misunderstanding of how the joint was shaped. However, later in the semester, Marta wrote of an experience where she was asked to dismiss this new awareness and knowledge. A teacher asked her to stand in a true parallel, to which she replied:

I have knock knees and my feet cannot touch closely because of this. With all of the experiential anatomy I am receiving this semester I assumed she would understand and move on. However she laughed at my explanation and said she had never heard of this concept. Then she asked me to touch my toes to give the illusion of a “true” parallel first. (Journal Entry, Experiential Anatomy, 05/01/05)

On certain levels, all dance forms *select* the bodies that match the demands each genre makes on the body. And yet the dance field would be very narrow if only naturally selected bodies were to continue on. Likely there have been many great dancers who are knock-kneed or have one leg longer than the other; they simply have learned to make the

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<sup>6</sup> This comment also made reference to another dissertation looking at Butoh Dance, which may be founded on the bow-legged shape of Japanese dancers’ legs.

<sup>7</sup> See Fitt, 1996, p. 50. Dancers with this condition, also known as genu valgus, bear more weight in the medial part of the leg; this affects the dancers’ ability to perform certain movements.

necessary accommodations in their bodies so that they could continue dancing.<sup>8</sup>

However, for the students in the Experiential Anatomy courses, discovering how their bodies were physically capable, or challenged, in particular styles of movement, became pertinent to their performance as dancers.

And what about styles of dance wherein a specific (re-)interpretation of anatomy is used as support for truthfulness? The “beveled” foot in ballet is an aesthetic ideal, but in a scientific model, such as the model used in kinesiology, it is not anatomically sound. The natural position of the foot is slightly supinated which is in opposition to the winged eversion of a beveled foot.<sup>9</sup> Certainly this mismatch between artistic and scientific models has the potential to create confusion, particularly for the dancers in the study who initially learned about the body through dance, instead of anatomy or kinesiology. Ballet, for example, favors the aesthetic rather than anatomic or somatic information. As Bridget asked, “How does one develop body awareness and how does one develop skills to witness without judgment. I zoned into watching things like sickled or flexed feet...tell tale signs of the aristocratic dance world’s view of ‘poor technique’” (Journal Entry, Experiential Anatomy, 02/25/05). However, would the development of a technique based on the structure and function of the body be more desirable? To use the words from a member of my committee, “Can we build a dance technique on anatomical expertise, and

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<sup>8</sup> According to Fitt (1996), “There is no possible correction for knock knees...but in the studio certain adaptations need to be made...Knock-kneed dancers should not be forced to stand in parallel with the feet touching” (p. 50).

<sup>9</sup> A beveled foot is a combination of eversion and pronation. In both of these conditions the weight is transferred to the medial aspect of the foot with the toes abducted. See Fitt, 1996.

if we did, would it really be dance?” (Linda Caldwell, Personal Communication, 12/05/05)

Rather than limiting their focus to either an anatomical or dance ideal, the best strategy for the dancers was to learn to mediate between individual physical attributes and technical demands. As an example, in the Ballet II course the students explored the contribution of their individual levels of strength and range of motion to find a balance between support *and* range of movement in actions such as *développé*. The goal was to discover a way to move that was right for them instead of trying to achieve some predetermined position.

Each of the dancers who participated in the study had a specific goal for how she would find success within the dance field. Each had likely gone through some process for evaluating her abilities in the styles of dance she had experienced as well as the match or mismatch with these that she identified in her own body, but likely this assessment was only subconsciously processed. Whereas one student had previously been told that the “study of the body enhanced expressiveness” (Toni, Mid-Term Interview, 03/05/04), it was not clear if this information was embodied in her movements, or just in her perspective. It was clear that during the study, the dancers saw value in the anatomic information, but the long term retention of this information was limited (Summary, Follow-up Interviews).

### Describing the Body and Defining Sensation

In this section, I will examine the many ways in which the dancers tried to communicate their experiences. Journal entries documented the discoveries the dancers

were making while working with the concepts, their quests for a workable language, and their experiences with partner work. In recounting their experiences, the dancers used many different languages to tell their evocative stories; they also accessed visual, spatial, kinesthetic and imaginative information to help them make sense of what they were feeling in their bodies.

In general, the dancers found the anatomic and somatic information and explorations stimulating and interesting. As Molly wrote, “I think visualizing the interior structure of the foot helps in articulating the foot in technique class. If I see the possibility for movement on paper or in the skeleton and visualize it in my mind, I feel that the potential for articulation in my own foot is increased” (Journal Entry, *Experiential Anatomy*, 02/25/05).

During both *Experiential Anatomy* courses, the dancers wrote in their journals immediately following the movement explorations. These group experiences of guided discovery elicited varied individual responses. When asked to write about their experiences in the exploration, some wrote immediately and then reflected; others waited for a few moments as if completing the sensory experience and collecting the words they wanted to use. Some wrote in stream-of-consciousness paragraphs, while others jotted down just a few words. Many wrote about the sensations of the explorations themselves but not necessarily about how they could apply this information. However, after the first class, Belinda wrote the following:

I found myself sensing my body on a bony level, then epithelial (skin). My bones felt stable, not clinched and in flux. My skin poured over my contents as a protective container that felt my soft clothes wrapped around

it. My muscles felt warm (after walking) and ready for movement, the sensation to dance empowered me. (Journal Entry, Experiential Anatomy, 1/23/06)

What I find interesting about this journal entry are the various levels of information Belinda brings to her writing. She is looking at the different systems of her body, discussing them metaphorically and connecting sensation from her body to an emotional state.

Within all the courses there was an emphasis on learning the names of anatomical landmarks (e.g., greater trochanter) as well as translating the vernacular to the scientific (heel bone is called calcaneous). The intention was for the students to become as conversant in the language of anatomy and kinesiology in their verbal description as in their somatic or 'felt' understanding of their bodies. However, the students balanced the scientific vocabulary with other languages and concepts they had been introduced to. Again Belinda serves as an example of processing the information and experience on many levels. She wrote:

I had difficulty finding my lesser trochanter. I had trouble visualizing while walking and imagining them swinging from the acetabulum. But, because my skin movement was sending me other information, I got really good feedback from swinging my greater trochanter, I am excited to visualize this when dancing. I really could visualize my pelvic rotation. (Journal Entry, Experiential Anatomy, 02/11/05)

In both the journals and mid-term interviews, the dancers described their bodies in general terms rather than with the precise anatomical language they had been exposed to in the course. However, it was clear that the dancers were not confident using anatomical

language, and for some of the dancers, perhaps there was too much material. As one student noted:

The exercises don't always make sense to our readings. I can't relate or connect to them...I highlight or make some sort of notation by the ones that do work for me, that way it is easy to go back and find some imagery or anatomical material. (Dani, Journal Entry, Experiential Anatomy, 03/04/05).

Although it was certainly the teachers' desire to have the students learn the language and integrate the concepts, knowing that they had a system to reference back to the material was a step in the right direction. And while the anatomical terminology served as a good point of entry, the dancers used other languages as well.

### *Learning New Languages*

All of the students should have had some experience studying anatomy prior to participation in the courses used in this study. The students in the Experiential Anatomy courses, for example, would have had some anatomy in their undergraduate programs; the students in Ballet II and Introduction to Dance as an Art Form would have studied anatomy more recently (than those in Experiential Anatomy) as part of their high school biology curricula. Theoretically, participation in the courses utilized in this study would have presented the opportunity to review anatomical information.

During the 2004 Experiential Anatomy course however, only one student had experienced in-depth study of anatomy balanced with a somatic perspective. The rest of the students acknowledged distance and lack of memory for much of the material they had learned in kinesiology or anatomy courses. Additionally, none of the students seemed confident in what they remembered from these courses. For many of these

students, the names of leg muscles were familiar, but they treated the muscles of the shoulder joint and the actions of the scapula like new information.

For many, the anatomical language was a stumbling block in the course, difficult to remember, difficult to pronounce, challenging to incorporate into conversation. And yet, a few totally embraced the language. In the mid-term interview, Isabel discussed that for her, anatomy was truth, and learning the language was empowering for her. “To study anatomy is a source for me making my own revelation. That is why speaking a language is empowering – it is the truth – impressive.” She noted that the language had given her a means to understand the experiences in the course as well, “therefore I think this language is symbolic” (Mid-term Interview, 03/09/04). In the follow-up interview, Isabel discussed how anatomical language was necessary for description, and how specific language initiates change (Follow-up Interview, 06/06/04). Finally, Gayanne, who was a kinesiology major as an undergraduate student wrote, “I know the anatomical language, but I need to come up with practical applications” (Journal Entry, Experiential Anatomy, 04/09/05).

Many of the students from the 2005 Experiential Anatomy course had taken a Laban Movement Analysis<sup>10</sup> course the previous semester. These students used Laban’s language regarding Space and Effort to describe their experiences in the course as much as (if not more than) the anatomical terminology. Some of the dancers discussed the relationship between feeling and form, patterning, and what is “correct.” For example,

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<sup>10</sup> Based on the work of Rudolf von Laban (1879-1958) and further developed by Irmgard Bartenieff and Peggy Hackney, this work discusses the polar ranges of four aspects of movement: Time, Weight, Shape and Flow, known as the Effort Elements.

Amye discussed changing the initiation for a figure eight arm swing in modern class:

“When I initiated the arm swing from my arm, the movement felt flat and the movement was [limited to] one arm... but [with] the shoulder blade initiation, the movement became more 3-dimensional” (Journal Entry, Experiential Anatomy 04/12/05). Amye could have addressed this same sensation talking about the range of circumduction in the glenohumeral joint or the integration of scapula-humeral rhythm (as this was one of the ways the information was presented in class), but she chose other descriptive terms instead.

In the interviews conducted six and eighteen months following the Experiential Anatomy courses, most of the participants acknowledged that while they weren't using the anatomical language per se, the concepts that had made sense during the course were still with them. Isabel discussed a new experience regarding the placement of her shoulders as it related to turning. The adjustment was so small and simple she wondered why she hadn't figured it out before. She noted that before this discovery she was only patterning the movement, but now she had “developed a feeling, a knowing” (Follow-up Interview, 10/23/05). And Belinda observed variability in her perception of Time and Effort; she noted that working with these variables might help her better understand balance. Belinda wondered, “Do we lose or gain our balance by trying too hard?” (Follow-up Interview 10/24/05) This question was not reflective of strategies for thinking about balancing per se, but of a means for thinking about how she approached movement.

### *Seeing and Feeling*

Among the many dichotomies dance training perpetuates, the contexts in which dancers distinguish between seeing and feeling seem prevalent. But is this a somatic or a semantic difference? The nature of a dance environment favors visual, spatial and temporal information over kinesthetic, but in movement the dancers are developing and experiencing a “sense of moving.”

Repetition, which is common in most dance techniques, leads to refinement of movement; practice makes perfect. During this process the dancers develop both a kinesthetic understanding of the movement and their bodies’ capacities for proficiency. But in this process of repetition do they acknowledge a sensory perspective *or* become desensitized to their bodies in lieu of following visual-spatial cueing?

This sensory versus visual-spatial dichotomy was clearly illustrated on the day the class focused on the hip joint. As an exploration, the Experiential Anatomy students were asked to perform a leg swing in attitude to the side. As they had done this action many times, they could pattern this action immediately. Based on an exercise from Andrea Olson’s *Body Stories*, the students were then asked to initiate the leg swings from different parts of the hip joint and observe the sensation. The movements looked the same, but as described by Dani, they felt very different:

When we moved our pelvis from the ASIS, greater trochanter, sitz bones, back of pelvis and lesser troch [anter], I could feel the differences in the initiations. Different muscles did more work – or different work, i.e. in the sitz bones, I felt more release in the low back, with the lesser troch my inner thighs worked harder, with the ASIS I felt as if I had more of a figure-8 shape in the movement. I gained access to some release in my

legs too – by the end of the exercises my femurs felt freer. (Journal Entry, Experiential Anatomy, 02/11/05)

Isabel, who was interviewed several times in the eighteen months following the course, realized that she was beginning to rely more on sensory than visual information, which she had previously acknowledged as dominant. But, was the focus on the sensory information helpful to all dancers? Bridget, seemingly full of uncertainty, asked, “Do I really understand what my body is doing during movement? How many levels of awareness do I have left to achieve?” (Journal Entry, Experiential Anatomy, 03/28/05)

### *Uncertainty and Certainty*

Within a dance class there is specific information that is given which falls under the classification of jargon or insider language. This particular terminology becomes part of the dancers’ vocabulary and is supported by imagery, presentation and context. While this codified language is oral, it references a visual standard, and most often the dancers use visual information to determine if their movements are “correct.” However, if this information is unclear to the dancer, it can create interference. In this section, I will discuss the types of information that the dancers used or received in relation to the usefulness of this data.

One source of ambiguity for the dancers in this study came from the use of imagery. A common teaching or coaching strategy in dance, imagery can help facilitate a change in the quality or feeling of a movement. The images are often visual representations that synthesize a great deal of information into one picture or idea. These images resonate differently with different individuals. For some, the rich imagery used in

dance training facilitates great change, while in others, it causes confusion. A specific example of this was “sitz bones to heel.”<sup>11</sup> This very general image speaks to dancers in many ways, creating either clarity or confusion. For example, Isabel explained that she ignored information that was not logical to her, and “sitz bone to heel” was confusing. Isabel noted that while the names of bones and muscles make sense to her, this image was perplexing as she was not certain if it was meant to be literal, metaphoric or directional (Mid-Term Interview, 03/09/04).

It was clear from the dancers’ discussions and writing that there were other sources of confusion as well. These included misunderstanding a comment from a teacher, a perception that their bodies were somehow not right for dance, or concern that they had done something incorrectly. In addition, discrepancies existed between how the information was presented in class and how the students heard or interpreted this detail. It would not be unusual to have a situation where a student was told one thing about her body but did not feel or perceive it that way. In other instances, a dancer might hear something differently from the way it was intended, or understand information in a way that contradicted her expectations. As the transmission of much of what is communicated in dance technique class is oral, particularly material that is qualitative or relates to action, the clarity of communication of both the image and the dancer’s expectations are vital.

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<sup>11</sup> This image is used in a variety of ways. In *Making Connections: Total body integration through Bartenieff Fundamentals*, Hackney describes this as finding the correct vertical alignment of the sitz bones “over” the heels.

However, when does the match of information that the dancer is receiving from the inside and the outside take place? Bridget stated that when she gets individual feedback, she is often surprised because it has to do with something she is not aware of. She wonders how perception is informed by the body, because for her, this information does not seem reliable (Summary, Mid-Term Interviews).

### *Matching The(ir) Ideal*

In dance there are often questions regarding the match of an individual dancer's body to an ideal (anatomic) body for dance. "I am resigned to the fact that what is right externally will not feel right [in my body]. I know what is right for me even if it is not right" (Toni, Journal Entry, Experiential Anatomy, 02/20/04). Uncertainty and insecurity caused these dancers to question their abilities to perform the desired technique and create ideal movements in their bodies. For example, Gayanne wrote in her journal, "The term correct is embedded in my body in a perfectionist way that if I do not do what is correct, I feel as though I failed. First of all what is the meaning of correct and how do you know when you are correct?" (Journal Entry, Experiential Anatomy, 04/25/05)

As the dancers in this study were not aspiring to a common goal in their dance careers, the application of the anatomic and somatic information in the form of imagery, feedback, and context should have varied as much as the individual. Within a given group of dancers, one might be focused on rotation of the legs in the hips, another on shoulder mobility. Therefore, each dancer had to assess what she was capable of performing in her body, and this capacity needed to match the criterion of the aesthetics she was studying.

Still, in some forms, all dancers must align or compare their performance to an ideal, although often this can be as qualitative as it is quantitative. For example, in arabesque, the dancers must find a particular quality of lightness or strength in the movement in addition to the more measurable standard of a specific height their legs should attain. Many of the dancers in all of the courses noted instances where their bodies did not fit the expected ideal, although toward the end of the 2005 Experiential Anatomy course, the dancers were also writing about understanding the uniqueness and capacities of their individual bodies.

The uncertainty that the dancers had regarding the match of their bodies to the ideal was an emotional one; not conforming or not knowing made the dancers feel vulnerable. Earlier in the semester Bridget had written, “I truly can’t describe the embarrassment and shame I place upon myself whenever I have some new body revelation – like if I notice that I’ve been sickling my foot in attitude” (Journal Entry, Experiential Anatomy, 03/04/05). This student also discovered that she could not trust the information she was getting from her body. She wrote, “Alas, my new found joy and excitement [from understanding a sensation in her body] comes only with looming criticism and a lurking reminder of what is ‘right’” (Bridget, Journal Entry, Experiential Anatomy, 04/01/05).

The dancers also questioned what was considered “normative.” Isabel asked, “Why is [C]hild’s [P]ose, good and rotation bad?” (Journal Entry, Experiential Anatomy,

03/31/04)<sup>12</sup> And Bridget asked, “Is my resistance to accept certain theories because I’m so comfortable with working with my own movement theories (Pilates based) and I just don’t want to change, or is it because it is unnatural...?” (Journal Entry, Experiential Anatomy, 03/28/05) Bridget also noted that the course readings made her challenge her notion of “where spine is” relative to the “navel to spine fixation” that she had learned in Pilates.

Reflecting on their experiences in the courses during the fall semester interviews, several of the dancers noted that perceptions of their bodies and of their performance still did not match comments or information they received from the outside. These dancers were uncertain whether they performed these tasks correctly, after receiving more information about their bodies. It also appeared that in order for an image or idea to be useful for the dancers, they needed to be ready to hear and process the information from a place of confidence.

### *The Novelty of the Focused Body Work*

Looking at muscles and bones in a book, or seeing this information relative to the skeleton is straightforward and clear. Yet, for the dancers in this study, “seeing” or imagining this information inside their bodies, or the bodies of others, proved to be both challenging and daunting. For example, when working with partners, many dancers were uncertain as to whether or not the practitioner, the partner locating structures or manipulating the passive dancer’s body, was in the right location. A further unspoken

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<sup>12</sup> Child’s Pose is a restorative position from Yoga. The dancer is kneeling with the knees open and the feet together and the body is rounded over the legs.

concern during the movement explorations was whether or not the dancers had identified the “correct” specific location in their own bodies. In general the dancers found it difficult to trust the sensations they were receiving, even if, in fact, they could identify the sensations that were coming to them. For example, did they really know where the lesser trochanter was located in their bodies? Could they sense movement initiating from that location and were they feeling something ... or nothing? As I wrote in my journal:

It is my general feeling that we receive a great deal of information from our bodies and yet lack the awareness or language with which to communicate what we are feeling. The anatomical language could give the dancers that ability, but so does the language they used from Laban when talking about the quality of movement – an important aspect of the Experiential Anatomy course. (Researcher’s Journal Entry, 02/25/05)

This uncertainty raised many questions for the dancers regarding both their abilities to apply the outside anatomical model inside their bodies (or inside another’s) and how to process the sensations they were experiencing. One dancer in the 2004 Experiential Anatomy course was often frustrated when everyone else “got it” (whatever concept we were covering), but she did not. She wrote, “There are times I want to make the connection and I cannot – this is frustrating” (Miche, Mid-term Interview, Experiential Anatomy, 03/04/04).

However, as the dancers became more comfortable with the information from the courses, they began to use anatomic and somatic terms blended with dance terminology and were more confident and open when communicating the sensations and feelings they were experiencing (Summary of 2005 Experiential Anatomy Mid-Term Interviews).

Marta, who had the least experience in anatomy or kinesiology of anyone in the class,

seemed to savor the language and the concepts she was learning. She wrote toward the end of the semester, “Twenty-seven bones? That is amazing to me. My hands are always busy; opening doors, serving as stoppers in movement, writing, washing, and now supporting my weight....in inversions” (Journal Entry, Experiential Anatomy, 04/06/05).

In general, the dancers could easily understand movement relative to a task or an idea; this understanding was often referenced through their individual bodies. When negotiating this translation, there were obvious landmarks for evaluation. For example, the structure of the foot, the amount of external rotation, or the limits of one’s range of motion can facilitate or inhibit a dancer’s movement goals. And yet in this evaluation, were the dancers practical about their capabilities? Are judgments about the body made from a factual or emotional perspective? The Experiential Anatomy course asked the students to take this one step further – not to judge their body’s capacity but to understand it.

### Connections the Dancers Made

#### *Injury and Pain*

Pain brings dancers face to face with the structure and capacity of their bodies. Pain and then cessation of pain helps them attend to their bodies in a more specific way, whereas soreness and fatigue tend to have a more global effect on the dancer. Pain illustrates the boundaries of a dancer’s structure, but also opens us up to considering new ways of moving.  
(Researcher Journal Entry, 11/25/05)

Injury and pain inform the body in very specific ways. Pain tells a dancer how her body is feeling, where she is on a given day and what she is doing right or wrong.

However, injury also teaches one about the body – not only in the midst of the

limitations, discomfort, and frustration, but also when those disappear and the dancer feels she “has her body back.”

Several of the dancers in the Introduction to Dance course were dealing with injuries. Terry had injured her foot in the previous year. While she remembered the exact moment the injury happened, she wondered if she had made herself susceptible to the damage (Follow-up Interview, 04/20/05). Another dancer realized that her past injuries were still an issue with her as she was always subconsciously trying to protect herself. She discussed that she was compensating for past injuries in some of her movements; she also wondered if this adjustment would eventually cause additional injury.

How an individual tolerates or translates sensory information about pain is highly variable. During the mid-term interviews for the 2004 Experiential Anatomy course, four of the six dancers talked about pain in detail. Of the two who did not address pain in depth, one realized that she had never been injured and thus could not understand it in others; the other only talked about the damaging effects of tension in her body, but cited nothing specific. For one of the dancers, however, pain and injury were the context through which she understood her body and previous dance training. And while absence of pain should give as much information as its presence, as one participant noted, it took a while for her to realize that she was no longer in pain when dancing (Summary of Mid-term Interviews, 2004 Experiential Anatomy). However, one student in particular was never released from pain.

Miche, one of the students from the 2004 Experiential Anatomy course, realized that she always focused on her pain in the course. She felt this attention to pain may have impaired her ability to absorb and understand of the material. As Miche noted in her journal, she was pre-occupied with the pain she was experiencing. For her, pain resulted when “you do something wrong” (Journal Entry, Experiential Anatomy, 03/13/04). In a follow-up interview, Miche commented on this: “The more attention I gave to the body, the more of a hypochondriac I felt like. [T]he more attention I gave my body the more caught up in it and the more self consumed I became.....but it is important – it is your body” (Miche, Follow-up Interview, Experiential Anatomy, 06/01/05).

*Did Paying Attention to the Body Reveal or Create Discomfort?*

At times focusing on the body brought up information that was difficult for the students, e.g., memories of injuries or negative self images related to the structure of their bodies. During both semesters of the Experiential Anatomy course, when the topic for the day focused on a particular body part, issues of past pain or current discomfort surfaced. As soon as the topic changed, or we moved on to a different body part, however, identification of this sensation disappeared from the dancers’ journals. Focused study of the body resulted in greater awareness of the body, and yet this was translated into pain or discomfort for the dancers. The dancers never noted if this pain affected their dancing, mostly they addressed their consciousness of the body part. However, the dancers were keenly aware of the attendant pain or discomfort associated with the body part being studied, and they mused about how these feelings arose and subsided. As Melissa wrote,

I will start off my journal by mentioning weekly sympathetic pains. I actually had toe cramps in class on Wednesday, which I have never have, making it the third week in a row that I had pain associated with our topic. I think I was really focusing on articulating my feet during tendus which probably caused them, but I still find it quite amusing. (Journal Entry, Experiential Anatomy, 2/19/04)

And yet as co-teacher for the Experiential Anatomy course, Sarah worried that the dancers seemed to get “stuck in their pathology or stuck in pathologizing their habits as fundamentally injurious” (Sarah Gamblin, Personal Communication, 12/16/2005).

Dancers must maintain a fine balance with pain.

Our bodies give us perplexing information. Molly, one of the dancers from the 2005 Experiential Anatomy course was inspired by the idea of working to prevent recurrence of back pain, which she had dealt with from an injury sustained several years previously. She tried rehabilitative back exercises as a precautionary measure, however this re-ignited her back pain and caused confusion about how to take care of her body. Melissa realized that all of her efforts at finding external rotation was making it painful to stand in parallel. She wrote, “I wonder if my knee problems could be related to this” (Journal Entry, Experiential Anatomy, 02/05/04). And Roberta, who was rehabilitating an injury she had sustained over the summer, stated that she was “dancing cautiously because of my fear of injury.... I wonder if this will change my dancing permanently” (Follow-up Interview, Experiential Anatomy, 10/24/05).

Melanie, who had been experiencing general body joint pain, was told that she was “holding too much in her joints” (Mid-Term Interview, 3/27/05). This dancer had experienced chronic pain in her knees, but she had recently discovered a different way to

conceptualize the action at that joint with Alexander technique.<sup>13</sup> This method gave her relief from her knee pain as it taught her to think about her body more holistically.

The dancers in this study acknowledged the presence of pain. How they dealt with this information varied by individual, but it seems clear that the dancers know about their bodies relative to the presence or absence of pain, fatigue, or confusion. What is less clear is whether the dancers could describe a natural healthy state of the body, a state marked by the absence of pain.

#### *General Information Became Meaningful in the Application*

The explorations in the Experiential Anatomy courses were not designed to be a means to an end, but to be applied within a context. Certainly there was intrinsic value in the anatomical and sensory material, but for the dancers in this study, it appeared the information was most useful when it was used in context. For example, in all of the courses in the current study, the dancers were introduced to a topic and then spent time exploring the information inside their bodies using imagery in constructive rest, changing their relationship to gravity by working on the floor or by working with partners. Following this internalization of sensory and tactile information, the students directly applied this experience to a concept, such as rotation, or to specific dance movements. However, they still needed to integrate the information about their bodies into their dancing in order for synthesis to take place.

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<sup>13</sup> Alexander technique focuses on habitual movement patterns and helps the practitioner overcome unproductive movement patterns by inhibiting them (Maisel, 1995).

For example, one day in Experiential Anatomy there was investigation of spiraling as an action of the front and back of the body. The desired effect was to build on the experience of spiraling in order to expand the dancers' perspectives for turning. The students began performing spirals while lying on the floor and then progressed to spiraling on a physioball. Following the work on the ball, the dancers stood up and practiced pirouette en dehors. Most of the students found this exploration to be very beneficial. As Belinda wrote:

It is easier for me to remember the feeling of equilibrium motion (to have continuous progressive pirouettes and balancing) rather than imagining balance as stillness. Coming to know that the body is in constant motion helps me approach ballet in a way that is more realistic, tangible and approachable. (Journal Entry, Experiential Anatomy, 01/28/05)

Another student commented that taking Ballet III at the same time as the Experiential Anatomy course was beneficial; she felt the information helped her understand ballet, taking her beyond just doing the actions, and she had less tension in her body. In the Ballet II course, demonstrating how the muscles of external rotation created "turnout" was an effective focal point to help the students feel this action in their bodies.

Katie, one of the participants from the Introduction to Dance as an Art Form course wrote, "In my modern class on Monday, I really noticed my joints while dancing... I found it pretty interesting that our body can move in so many directions because of our joints" (Journal Entry, Introduction to Dance as an Art Form, 10/20/04). And in the same class Brendan wrote "The information that I had read took on new meaning when I used my body to sort through the information. It was interesting feeling

what my body was doing in the different planes [of movement]” (Journal Entry, Introduction to Dance as an Art Form, 09/20/04). Whereas often the course explorations created a context for the dancers to reflect on the general components of the movement or their abilities as dancers, it seemed that this investigative approach also afforded the students opportunities to think about their bodies as contexts for more specific information.

### *Points of Interface or Intersection*

The students’ experiences in the different courses were individual and wide ranging, and several points of intersection served to synthesize their experiences. In the examples listed in this section, the students were able to make connections with the information they were receiving back to the larger worlds in which they were aspiring to work. These intersections included application of the anatomical information, classes in improvisation and contact improvisation, and alignment.

In both semesters of the Experiential Anatomy course, a few of the students were completing a certification program in Pilates and had therefore recently engaged in additional study of the structure and function of the body. And for many of the students, whose previous experience in anatomy was positive, they were able to process the information about the body in more depth, both in the Experiential Anatomy course, but in their other courses as well. There were, however, a few students whose first experiences with anatomy were negative or presented in a way that did not seem applicable to them. For these students, a lot of time in the course was focused on

learning or relearning the names of muscles and bones. And, for Marta, who had not had any prior study in anatomy, but knew her body had a specific anatomic variation:

I am curious to know how my slanted spine fits into the puzzle. To be honest, even though I have scoliosis, I have never had back problems or pains. The only abnormality I have noticed is a difference in flexibility and reach between my right and left sides. Now knowing the strength and intricacy of the spine, there has to be a way to train it to be flexible evenly....or is it too late? (Journal Entry, Experiential Anatomy, 03/02/05)

This journal entry raises very important ethical issues, which will be dealt with more deeply in Chapter IV. However, it is important to note that there was never an instance where the students were asked to try and alter any perceived abnormality in their anatomical structure. The students were asked to identify structural differences in their bodies, but then to also develop an understanding of how to work with the variations they discovered.

There was direct application of the information in the Experiential Anatomy courses and in Ballet II, evidenced by the specific strategies written in the student journals. One student decided to address how she was using her legs in order to release muscular tension; another discussed “pushing against the floor” through her leg to balance, and thereby released the gripping in her thighs. Some of the students developed these strategies on their own through the use of imagery. At times the dancers used the images literally, and sometimes they transformed them by using them in a specific context. For example, one of the dancers stated that the use of breath helped her “achieve the whoosh or down and up feeling down the back to my leg to raise my knee” (Molly, Journal Entry, Experiential Anatomy, 04/19/05).

### *Touch and Improvisation*

The dance department at TWU fulfills its commitment to individuality and agency for the dancers through its somatic approach to teaching technique, and through the incorporation of Contact Improvisation and Improvisation in the curriculum. These courses supported the explorative nature and use of touch employed in the Experiential Anatomy courses and Introduction to Dance as an Art Form. In turn, courses in this current study helped the dancers transition into the intimate contact and bodily focus often called for in improvisation. This point of intersection was an important link for many of the dancers involved in this study.

For many of the students in Introduction to Dance as an Art Form, and even for some of the graduate students, the body-centered focus provided a different approach to thinking about dance than they had previously been exposed to. While not everyone in the classes used in the research was comfortable with the experiential approach at first, during the mid-term and follow-up interviews, the dancers all commented on feeling at ease with improvisation and contact improvisation in general. Of the twenty-six participants in the research courses, there was only one exception to this.

In the Experiential Anatomy and Introduction to Dance as an Art Form courses, in particular, touch and working with a partner played a vital role for helping the dancers clearly locate and feel something in their bodies. Many times, one partner used touch to bring awareness to a particular body part for the other. For example, placing a hand over the scapula to locate that landmark in the body aided in the recognition and facilitated processing sensation for that particular bone and muscle complex.

Although for some of the dancers, it took time and trust to gain confidence necessary for working with a partner, as one noted, when working with someone she was comfortable with, the pressure of another's body helped her relax (Summary, Follow-up Interviews). For another, touch and improvisation helped her find a way of moving she wouldn't have explored on her own. Diana stated, "Having to 'just do it' has been good" (Journal Entry, Introduction to Dance as an Art Form, 10/10/04). And Melinda, who was uncomfortable working with touch at first, saw a purpose for it by saying, "Partnering has pulled me out of my box" (Follow-up Interview, 03/02/05). And as the dancers learned to feel comfortable working with one another, they also began to feel more comfortable in, and knowledgeable about, their own bodies.

Improvisation, new for many of the students, even in the graduate program, presented a challenge. One dancer in particular, whose background in dance was drill team, found improvisation difficult and initially rejected its value. In later reflection this dancer noted that improvisation helped her develop an inward focus, facilitated in part by observing what was happening in her body. She wrote, "It used to be just responding or moving with music – now I have done more and see the difference – contact – space, interior" (Gayanne, Journal Entry, Experiential Anatomy 04/01/05).

Because of TWU's strong commitment to improvisation and partnering work, the courses in this study helped contribute to, and benefited from, the social environment of somatics and improvisation in the dance program. The students, new to improvisation, quickly came to see that it was a way to understand their strengths and preferences as

dancers, and a means to develop their artistry as dancers, not just technicians. And in the process they learned more about, and from, their bodies.

### *Alignment*

One of the first topics covered in the course was alignment, and most of the students seemed to make the connection that alignment (not just posture) would be an important factor for gaining efficiency in their movements. All of the dancers understood the importance of alignment and focused on how alignment related to their dancing. Alignment relates to how the body is oriented vertically, but also reveals patterns of muscular tension or postural habits. The dancers could see how this tension in their bodies was both counterproductive and damaging. And while alignment is observable from the outside – standing in class and looking in the mirror or orienting oneself through different dance genres—it is also something the dancers came to understand through feeling or by “viewing” their posture from the inside the body.

Alignment offered a specific perspective for many; how they were feeling on a given day, a reflection of their energy or of their self esteem (Summary of Mid-term Interviews, 2004 Experiential Anatomy). One of the dancers described thinking of alignment as a touchstone from which she could gauge other aspects of her dancing. Another noted that proper alignment might alleviate pain she was having in her body. And many of the participants discussed alignment relative to patterns of muscle tension they had become aware of during the courses (Summary Follow-up Interviews, 2004 and 2005 Experiential Anatomy).

An interesting development in the 2005 Experiential Anatomy journals and mid-term interviews was a discussion of alignment or bodily perception in relation to the dancers' cars. Several dancers commented that they evaluated their alignment when they got into their cars, as they would need to re-adjust the rear view mirror. Another dancer mentioned that she had specific landmarks by which she measured her height and size in the confined space (Summary 2005 Mid-term Interviews). Consciously or not, dancers do select worlds to size themselves up and situations to orient themselves within.

#### Developing Portraits of the Participants' Experiences

In processing and summarizing the data from the courses, it was clear that the readings and activities were producing different results and responses. While some of these data have already been presented from a single entry representing several participants, what follows is a narrative which is comprised of many voices. Labeled a *portrait*, this section highlights the rich narrative describing the experiences in the dancers' journals following a particular experience or reflective of a specific context.

This first rendering recounts the sensation that followed an exploration: massage of the inter-osseous membrane between the tibia and fibula, the two bones of the lower leg. This activity was done with partners. One dancer sat on an elevated surface so that the lower legs could easily hang down from the thighs. The partner (masseur) began by finding the bony landmarks: lateral and medial malleoli, and the tibial tuberosity. Using the thumbs and working with intent, the masseur tried to find the space between the tibia and fibula. The masseurs were asked to visualize touching the membrane that holds these

two bones together, to imagine touching the inside of the body or underneath the exterior surface. What follows is a composite from many of the participants' journal entries.

*Portrait: Inter-Osseous Massage*

After the inter-osseous massage, I was more aware of my right leg and I had the sensation of the massage on my skin – this allowed me to imagine a more stable connection. Actually it wasn't so much a new sensation as it was an absence of the old one. I felt straightness in the lower leg. My shin felt rejuvenated, there was less tension in the back of my knees and the bottoms of my feet did not feel as stiff. I also experienced a cooling sensation, which I learned might be connected to more circulation in that area.

The more pressure the better! About a minute after the massage, my leg was so relaxed. I felt like there were holes along the leg – that it was exposed – as I was walking around it felt as if the space between the two bones had opened up and there was air passing through the opening, through my flesh.

When I was giving the massage, I was aware of the rigidity of the tibia and how far it continues down to the foot. I was made aware of the width of the tibia and fibula – how wide our legs are and how frontal they are. I wonder what the back of the bones feels like...

### Summary

The dancers in this study were dealing with many ideals and expectations, both in terms of models they were aspiring to and how they, as individuals, were processing the anatomic, sensory and aesthetic material covered in these focus courses. The dancers understood their bodies relative to pain, particularly the presence of pain, and they “sized themselves up” relative to their alignment. They credited visual feedback as important, but by the end of the courses, and during the follow-up interviews, most of them talked about their sensory experiences in greater detail than about the visual input they received. Most of the dancers felt that the information in the courses complemented their training and made them think about their bodies, although some felt that thinking about their

bodies interfered with their dancing. Many were not certain whether they knew the anatomic facts, whether they could transfer the “outside” information to understanding their own bodies (or the bodies of their partners) or whether they could trust the sensory data they were processing.

Nonetheless, the information and the explorations were intriguing to the students, and the journal writing revealed a myriad of ways that they were processing the information. There was a time where each of the participants connected to the anatomic and sensory material with her dancing although this happened at different times for each dancer. Although the language, referents, and applications varied as much as the participants, at some point during the courses, albeit at varying points, the information had some meaning for each of the dancers.

In the next chapter, this application and translation of the material will be discussed, focusing on how the dancers attended to and processed the information, how the experience of the courses contributed to their integration of the material and the importance of taking time with the material.

## CHAPTER IV

### THE DANCERS' EXPERIENCES

The goals for the research and the courses were the same: to observe the effect of learning anatomic information in experiential and applied contexts. By designing courses which balanced information about the body, and where the information was directly experienced at a bodily level, would the dancers come to “know” this information “in their bodies?” This overarching question shaped the following goals: 1) to enable the students become familiar and confident with the anatomical language and models; 2) to provide opportunity for students to reference the language and models both in their writing and their contributions to class discussions; 3) to provide a context for the students to understand the anatomic information in their bodies through the somatic work; and 4) to encourage the dancers to apply the information presented in the course, not as an end in and of itself, but rather to the other dancing they were doing and relative to ideas they had about dancing in a larger context.

The structure of each course was similar: 1) introduce the anatomic and somatic material, 2) apply the experiential discovery, and 3) reflect in writing or verbally, through the process of considering specific anatomical information balanced with physical exploration. Many of the dancers experienced similar activities in the courses used in this research, as well as the rond de jambe study, yet each reflected as individuals on their physical bodies and how their bodies influenced or facilitated their dancing. Therefore,

this chapter explores how the students responded to the approach used in the courses, when they focused on the anatomic and somatic information, and how they attended to their experiences.

### Entering Into and Engaging in the Process

For each course I chose specific texts to provide a foundation and a context for the dancers. All of the texts present both visual and practical information balancing scientific terminology with dance vocabulary. The readings, primarily focused on muscle, bone and systems of the body, were selected to provide information that prepared the dancers to understand and participate more fully in the class explorations and discussions. With these concrete references, students could refer back to the information at a later date. The students in the Experiential Anatomy courses read Eric Franklin's *Dynamic Alignment through Imagery*, Irene Dowd's *Taking Root to Fly* and Andrea Olson's *Body Stories: A Guide to Experiential Anatomy*. In addition to detailed anatomical information these books contain complementary visual images that are both metaphorical and representational. The drawings in Franklin's book, based on anatomic landmarks, are presented as animations or caricatures. Dowd illustrates her anatomical images, but writes about the body, and movement, from a philosophical stance. Olsen mixes concise anatomical detail with personal narrative and emphasizes exploration, either with a partner or individually, and then asks dancers to reflect after action. I used Olsen's *Body Stories* in Introduction to Dance as an Art Form, and I chose Greig's *Inside Ballet Technique: Separating Anatomical Fact from Fiction* for the Ballet II class.

The students' responses to the assigned readings were mixed. Most of the dancers found Franklin's images and information accessible and understandable. Franklin's simple yet evocative images, specific yet playful, seemed useful for the students. For example, Franklin masterfully combines information about the body with the action of exploration, for example, "roll and glide" at the knee (Franklin, 1999, pp. 158-160). This particular image succinctly describes the structure and function of the knee, or patello-femoral joint, and the dancers experience it from the viewpoint of sensation or awareness.

In contrast, one of the dancers found Dowd's imagery complicated, although this dancer noted that the depth of the information challenged her. And, while some found Dowd's writing inspirational, one dancer was troubled with the leap Dowd made from "fact to fantastic" from understanding the structure of the body to ... "imagin[ing] there is a waterfall" (Janelle, Mid-term Interview 04/04/05). As Janelle explained, "I think if there is knowledge, it doesn't have to be loose and metaphysical and airy and intangible...I feel that this is concrete information and somehow it gets lost" (Mid-term Interview, 04/04/05).

### *On a Given Day in Class*

The students would have come to class having completed the assigned readings for the day. Generally the discussion would begin with the readings and demonstrations with a skeleton. Freestanding while supported by a pole, the skeleton was a central figure for discussions about the structure and function of the body. As an aid for the dancers to locate these same landmarks in their own bodies, Sarah or I would palpate the landmarks on the skeleton that we were discussing. The skeleton gave the dancers a concrete point

of reference; often the information from the skeleton was the basis for an image used in the class, or it served as a point of reference for the movement explorations.

In a few instances we incorporated a Thera-band® to demonstrate the origin and insertion of a particular muscle and to help the dancers visualize a specific landmark or location in their own bodies.<sup>14</sup> We used other props as well. For example, on the day we discussed the diaphragm, a structure involved in the mechanics of breathing, I used an umbrella as a visual aid. I opened and closed the umbrella to demonstrate how the dome-like structure of the diaphragm. It is pulled down on inhalation and creates an arc as it rises on exhalation. Another day the students watched me “model” abdominal muscles made of brightly colored felt.<sup>15</sup> The students easily envisioned the layers and orientation of the muscle fibers for this group of muscles using these visual aids.

Many dancers commented that the tactile and visual information (i.e., the skeleton and props) clarified the anatomical information and helped them find application or a new awareness. As Melissa wrote:

Looking at the pelvis helped to remind me of its weight and volume and these images in turn help me find power and stability. I seem to find more power in my weight shifts when I think about the weight of the pelvis and how it can support the rest of the body. (Journal Entry, Experiential Anatomy, 01/24/04)

We augmented visual perception with tactile information by encouraging the dancers to touch the skeleton and to palpate bony landmarks in their own bodies.

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<sup>14</sup> For example, the psoas, a muscle that originates on the anterior facets of the lumbar vertebrae, and direct anteriorly and caudally as the muscle attaches to the lesser trochanter. Using the skeleton and theraband helped the dancers understand the three-dimensional or spatial orientation of this muscle.

<sup>15</sup> Rectus Abdominus, External Oblique, Internal Oblique and Transversalis Abdominus

The dancers also experienced touch when working in partners. In the following journal entry, Molly reflected on working with a partner as a key to understanding hip mobility:

It was enlightening for me because I work with my own hip all of the time. I am usually a visual learner of movement, but this time touch proved valuable. The combined focus of trusting the floor and creating a relationship with it helped me to fold in my hip sockets even more. (Journal Entry, Experiential Anatomy, 02/09/05)

Molly continued:

I had to look up or out a lot when I was working on Bridget, because if I looked at what I was doing, I lost the focus. I also felt the intention of my touch change depending on my focus. (Journal Entry, Experiential Anatomy, 02/09/05)

In these journal entries, Molly was using sensory modes to obtain information she had not previously accessed. She acknowledged that the tactile information was useful, and in fact, realized that her hands and her body were providing information that was not dependent on visual affirmation.

In fact, touch was powerful for many of the participants. As Marta wrote, “My partner’s vigorous approach was not disruptive at all. My body welcomed the movement and obeyed it by releasing immediately. After returning to the lying position, my partner and I noticed the change in muscle length immediately” (Journal Entry, Experiential Anatomy, 04/01/05).

Like Marta, Amye was also receptive to the sensory information she was receiving:

The experience of working with a partner and creating resistance between the two of us assisted us in the recognition of the weight of the bone and gripping of muscle. After we had pushed for awhile and walked around, I

noticed a sensation of release. (Journal Entry, Experiential Anatomy 02/18/05)

Working with partners and incorporating touch engaged all of the participants with the exploration: the dancers were both giving and receiving information from their partners. As the students alternately assumed the role of a practitioner or recipient of individual attention, they also engaged in communication, which added a further dimension to the experience.

### *Constructive Rest*

In addition to the readings, demonstration with the skeleton and work with partners, most of the courses included an activity called Constructive Rest.<sup>16</sup> In this position, dancers address habitual patterns by engaging in imagery without volitional movement. The goal of Constructive Rest is to establish new neuromuscular patterns for the body.<sup>17</sup> At the beginning of each course, many of the dancers thought that Constructive Rest was simply a time to lie on the floor. Most found “rest” easily, but many struggled to let go of tension patterns in their bodies; this struggle made it difficult for them to relax or find release in this position. However, as the dancers continued to practice Constructive Rest, they were able to address specific concerns in their bodies.

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<sup>16</sup> Sweigard (1974) described this position as ideal for finding minimal bodily tension. The dancer lies on the floor with her legs and hips flexed at ninety degrees, in what is sometimes called the hook-lying position. The feet are in parallel alignment with the hip joints and the soles of the feet are flat on the floor. The knees drop toward one another, and balance against each other, so there is medial bony support to minimize muscular tension in the legs. The natural curves of the spine are maintained and the dancer crosses her arms over her chest. The weight of the top arm supports the bottom arm so there is minimal muscular activity in those limbs as well.

<sup>17</sup> Franklin gives a clear definition of volitional and non-volitional imagery in his introduction to *Dynamic Alignment through Imagery*, p. 5-7

Subsequently, the dancers began to use Constructive Rest as a time to connect with or focus on their bodies as much as they used it to recuperate. The following portrait blends together individual voices into a narrative that describes the participants' experiences, moments of discovery, reflection, and awareness.

*Portrait: Constructive Rest*

At first...“ouch”... maybe this takes more practice and time. I found it very difficult to be comfortable in this position. I am feeling conflict between my scapulae and the floor - my right scapula presses deeply into the floor, no matter which arm is on top. I do not see how this can be helpful. I do understand that today the point is to submit to the discomfort and to remain in stillness; I need to keep working on this so my body can release into the position. I am told that there are times when you can't address what you need to in a comfortable position, so discomfort may help me better understand my body. I will stick with it.

When I find release in Constructive Rest, it is easier to refocus my mind and thoughts away from restless thoughts and into imagery, my self, my breath, and my body. Having practiced Constructive Rest, now I feel benefits in my full body: mind, muscles and bones. I have been using it before I go to sleep at night and first thing in the morning – it is helping me take care of my body, and using it, I have developed more awareness of my body.

I believe I have really found the rest in the position. Once I get there I don't want to leave it. At this point I enter my subconscious; I have a heightened state of awareness. I remember noticing that using imagery in Constructive Rest drew attention to different parts of my body; today was the first time I actually felt my skin. My mind was not making decisions, my body was feeling and sensing; I felt my proprioceptors tingle. It is a new sensation to me to be able to rest and be free of aches or discomfort while I am awake. And I realize that my early struggle with my scapula has gone away.

And I find it is restorative during the hectic schedule of my day. For example, I had just finished with ballet and was heading into modern. Sarah began the class with Constructive Rest. What a great way to transition my body from the physical demands of ballet to the free flow of modern. Constructive Rest – ok, now I love it.

Working through Constructive Rest, the dancers learned the importance of stillness and persistence. If nothing else, it allowed the dancers to eliminate all other distractions and begin to focus on their bodies. The wisdom of the bodily configuration designed by Sweigard is surpassed only by the profound implication in the name of the position: resting constructively gave the dancers access to their bodies.

### *Imagery*

Another exploration used in the classes included the use of imagery. Whereas imagery is often used in conjunction with Constructive Rest, an image can also be a simple model or idea that the dancers can refer to while moving. In the Experiential Anatomy courses, Sarah and I used many general images, either adopted from the assigned readings for the course or modifications of images we had worked with previously. These images, based on the anatomic structure or function of the body, provided visual models that served as points of departure for many of the somatic explorations we integrated into the course. For example, when we discussed alignment, we gave three images for the students to work with: 1) the head as a helium balloon (Franklin, 1996 p. 241), 2) the head floating on top of Roman columns, and 3) the idea of a geyser or fountain in the pelvis rising vertically to support the body from a central location (Franklin, p. 140). While a fairly even number of the students preferred one image over the other in both Experiential Anatomy courses, the “helium head” image seemed to work the best for the students in Introduction to Dance as an Art Form. One possible explanation for this is that the image of a balloon was the most accessible – the easiest to imagine.

The students were often tentative about using imagery. The following questions regarding imagery, which I have posed, illuminate possible causes for the students' uncertainty in using this method of imagining movement. For example, was imagery a mental picture the dancers moved from or a representation that emerged via sensations the dancers described as a metaphor? Was imagery a sensation the dancers brought forward with them from a previous experience? Did images evolve over time or were they fixed pictures? Or was an image simply an association? It was likely all of these options were in effect, plus many more. In fact, the images were not interpreted similarly by all who used them, and the breadth of images used, as well as the various interpretations of images, created as much potential for confusion as for clarification. What worked for one dancer did not work for another; what one person "saw" or felt in an image was likely different from what another person viewing or sensing the same idea experienced. However along with potential confusion, multiple interpretations also offered flexibility and possibility in how the image could be used.

Most of the dancers did use imagery in one form or another, but the ways imagery was being used were as numerous as the number of participants in the study. Some of the dancers wanted clarity and specificity in the images presented; a few dancers successfully used imagery as a strategy for organizing information. Nevertheless, a few of the dancers were uncomfortable with their inability to use imagery at all, let alone create images on their own.

Many of the dancers wrote about applying the practice of imagery independently, both in the courses used in the study and in their technique classes. A few of the dancers

wrote vividly and expressively in their journals, often creating their own images. Often these images were variations of an image or concept presented in class. For example, Cierra, one of the dancers in the 2004 Experiential Anatomy course, created an image of two spines to help her understand her alignment. By employing this image Cierra “felt taller. “I felt a separation between my upper and lower body – a greater ease with being able to move certain parts of my body” (Mid-term Interview, 04/01/04). Janelle wrote about using imagery as a strategy in ballet class. “I’ve been imagining bringing my leg up in seconde position and also arabesque and penché. Wouldn’t I be imagining the perfect arabesque? I am fascinated by imaging myself into better technique” (Journal Entry, Experiential Anatomy 04/07/05).

While some dancers made only passing reference to imagery, others provided rich detail. Belinda’s journal entry combined imagery with sensation as it addressed her emotional state:

I was able to really put myself in the image of exhaling and feeling the self drain (feel heavy). All of a sudden my brain transformed me into my bath tub at home. Except I wasn’t in the water ... that would have made me light and floaty. I was the substance at the base of the tub, and my contents (by exhalation) poured out of my body flowing into the drain. It was cleansing – I was emptying out bad, useless things and being replenished with the weight of my body on the earth (tub). (Journal Entry, Experiential Anatomy 03/31/05).

Bridget also used vivid imagery and language to describe and detail the information she was processing:

I feel like my perception is so relative. Prior to today I have always imagined muscle as thick, powerful, forceful, etc. When I initiated from muscle it was with brute energy and bulky power. But today, with bone in the picture, my view has completely changed... bone is a concrete column

and muscle is a thin, flexible aluminum space shuttle. (Journal Entry, Experiential Anatomy 02/18/05)

For Janelle, imagery included a reflexive and analytical response:

[E]ven though I'm imagining something [that I am doing well] there are parts to the whole I know aren't right. It's as if I knew I was losing my turnout or I knew I forgot to stay aligned. Why would this happen? It's been interesting because as I do it [use imagery], I find myself correcting myself in my thoughts. Why does this happen? If I'm imagining something happening, wouldn't it be an ideal situation?" (Journal Entry, Experiential Anatomy 04/07/05)

However, imagery limited some of the dancers' motivation or caused confusion.

Toni, one of the participants from the 2004 Experiential Anatomy course, noted her resistance:

I think just the words, "can you imagine," kind of bogs down the process. Just say the word, the metaphor is assumed and implied. I know [this] is picky about language. I know that I don't have a problem with misidentifying myself (be like a tree rather than be a tree), but I wish people would get right to the point. Certainly there are neutral images, like head as a balloon, it seems to be hit or miss – there is no secret formula – I wish I could tell a teacher – these images don't help me. (Follow-up Interview 05/07/05).

In the dancers' vivid descriptions I found both richness and contradictions, that further revealed the complexity of how they were using the anatomical information. For example, Isabel mentioned that she could command her muscles as, "my body is my slave" (Mid-term Interview, 03/09/04), yet earlier in the semester she had written, "Feeling is important to my learning" (Journal Entry, Experiential Anatomy, 01/31/04). And, in the last interview she participated in, Miche, one of the students from the 2004 Experiential Anatomy course, remembered the helium head exploration, experienced

during the first class in the semester, as one of the most profound experiences of the entire course.

It was the first time I ever felt the distance in my vertebrae, or that I was lengthening, or that I could feel something different...up to that point, every time we walked, no matter what the exercise was, no matter what the narrative was, it never changed for me, there was never any sensation ...to make it different, except on that day. (Follow-up Interview, 04/22/06)

Imagery also stimulated meta-questions for the students, which revealed the complexity of using this practice. Just before mid-term in the 2005 Experiential Anatomy course, Molly asked, “Does using an image actually change what happens during the movement or does it change the way I think about it?” (Journal Entry, Experiential Anatomy 03/09/05) This question situates imagery in a unique position: rather than limiting imagery to representing something concrete, the strategy of using imagery becomes metaphoric. For Molly, using an image gave her an option, and perhaps a strategy, to change the way she thought about her dancing body.

The research findings presented in this chapter reveal that imagery clearly played some part in the dancers’ experiences in the courses. The dancers used imagery to enable them to synthesize the anatomic or somatic information they were trying to conceptualize. And, although the dancers used imagery in many ways, the breadth of imagery’s purpose is insignificant. It is beyond the scope of this study to determine what triggered the images, however, the fact that the images initiated sensation or developed as a response to something the dancers were feeling, sheds light on how the students were processing information they were receiving from, or giving to, their bodies.

### *Bone and Muscle: Fact or Image*

The students were introduced to both muscle and bone in the models and written text in the Experiential Anatomy course. In addition, this information was used with imagery as the students were asked to visualize these structures and systems in their individual bodies. However, while the assigned readings for each class provided some detail regarding muscle location and function, during the class, information on bone dominated. Ironically, the students initially commented that they were more aware of muscle than bone. Two comments representative of the dancers' perceptions include, "I never think about bone, but I rely on muscle memory" and, "I have trouble focusing on moving bones without using muscles." Other dancers referred to muscle as something they toned and something that determined how one looks in a bathing suit. Two other dancers referred to muscles as being on the "outside" while bones were inside (Mid-term Interviews, 2004 Experiential Anatomy). Perhaps this perspective developed from an understanding that muscle interfaces with skin – the outside of the body. But muscles are also internal; they move bones and this allows dancers to dance. Only a few of the dancers referenced warming up their muscles and knowing when their muscles were ready to move.

The dancers often referred to "muscle memory" in their journals and the mid-term interviews. While the dancers probably never made a connection, their perceptions of "muscle memory" or how their bodies retain movement was imagistic. As one example, the dancers referred to muscle memory as a habitual response for movement, one they didn't have to think about. As another example, this concept seemed to reference a

feeling. And yet, were they seeing “brains” in the bellies of their muscles, or images of muscles in their minds? Were they processing muscle memory as metaphor, or was it a literal sensation, that their bodies remembered?

For some of the dancers, thinking about muscle was also associated with tension. Many dancers reported a negative relationship to muscles that were tight or inflexible which they could not control, or when muscular tightness limited their mobility (Summary, Mid-term Interviews, Experiential Anatomy, 2005). In addition, many dancers were more aware of tightness in their muscles than they were of release. One of my committee members, reviewing early summaries of the data, was interested in the fact that the students spoke about tension or release rather than a balance between both. From her perspective, when the students made the distinction between the two, they were reinforcing an either/or dichotomy rather than a somatic approach to thinking about the body (Linda Caldwell, Personal Communication, 12/20/05). These feelings of tension come from the dancer’s proprioceptive sense: the body has receptors to monitor pressure in the muscle or tendon. But no such apparatus monitors relaxation.<sup>18</sup> Therefore, while “release” could be termed a lack of muscular tension, dancers do not usually attend to their bodies feeling relaxed as a part of taking class. (A sense of release might make them think they were not working hard enough.)

As instructors, Sarah and I discussed the “bone paradigm” that we had been introduced to in our training, which had replaced an earlier philosophy that focused on

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<sup>18</sup> Muscle spindles are embedded between the fibers of the muscle. According to Fitt (1996), these spindles are a “sensory receptor sensitive to stretch, contraction and possibly velocity of contraction of the muscle tissue in which it is embedded” (p.106).

muscle. We discussed the importance of incorporating information on both bone and muscle and consciously checked our biases when talking about the body in class. In retrospect, it seemed that during most of the lecture part of the course we did favor bone; the skeleton was the primary conceptual model used in the course, not a diagram of the muscles.

When I interviewed Sarah a year after the course, she commented that the bone paradigm in dance practice gives her a means to “perceive her body proprioceptively from a feeling of weight.” For Sarah, releasing was “weighted-ness into the floor” and this weighted-ness gave her a sense of her skeleton (Personal Communication, 02/20/06). In this next portrait, the dancers’ comments regarding muscle and bone are combined into one entry, but they represent many of the voices from the 2005 Experiential Anatomy course. The journal entries come from both a specific writing assignment, and reflections that occurred throughout the semester.

*Portrait: Bone and Muscle*

Muscles are strength, bones are length. Bones are landmarks—I can visualize what direction they move, they give me weight and help me relax - landmarks help me locate the correct alignment. Learning about how both bones and muscles are involved with movement is helping me understand imbalances and pain in my body; I know both are required for movement.

Muscles are origins and insertions: grain flow, flow of energy, they are more alive to me, and they give me control. They are facilitators and help me balance in “unnatural” positions. When I am stretching I think more about the muscles – I can tell when they let go.

When I moved from bone, the tension in my body was minimal, probably for the first time ever. And this idea/revelation made me think about the use of energy and effort – I felt more weighted because the sense of bone in my foot felt more “digging” into the earth. I was also able to release my body into the floor with greater ease.

In the end, the dancers would adopt the images or sensations that worked best for them, and, as with the other responses to the information presented during the courses, these would likely change over time and vary with different circumstances. The individual dancer's paradigm may shift more toward muscle, or it may alternate between bone and muscle, but the consideration of the weight and mass of the body gives the dancers a particular context for experiencing their own movement, be it in dance class or performance.

### *Processing The(ir) Experiences*

The courses in this study offered the dancers time to attend to their bodies in a way they had not likely been afforded in their previous training. Experiential Anatomy and Introduction to Dance as an Art Form focused on the structure and function of the dancers' bodies, and how these related to and supported their dancing, but both courses deliberately set aside the technical specificity of a studio course. This approach was new, not only to the freshman-level students in the Introduction to Dance as an Art Form course, but to some of the graduate students in the Experiential Anatomy courses as well.

Initially, some of the students in Introduction to Dance as an Art Form had difficulty with the freedom and relaxed atmosphere in the course. The class struggled with the personal explorations that required self-discipline and maturity. Although the dancers were too polite to write about these obstacles in their journals, they were often hesitant to participate in activities. However, as the semester progressed and the dancers discovered that the class format complemented what they were learning in other dance

courses, they became more comfortable with the process. The dancers also became more at ease working with partners, and their ability to stay focused on the movement exploration developed until they were more deeply invested in the course goals.

The graduate-level dancers in Experiential Anatomy were more comfortable than the undergraduate students with the class environment and the focus on self-discovery. Most of these students felt the class lectures and explorations were vital for synthesizing the readings and information. As Molly wrote:

I gain greater knowledge of the body by doing the readings, and I begin to gain knowledge of my body by coming to Friday class. When I strive to be in my body, I end up in a half conscious still state. I suppose that I am in my body in the sense that I am better at attending to my body. (Journal Entry, Experiential Anatomy 03/04/05)

Even Marta, who had limited confidence with the material, recognized the class's value for understanding detail about the body. As she wrote in her journal, "Trying to learn the anatomical information on my own ....I would be overwhelmed" (Journal Entry, Experiential Anatomy, 03/04/05). And Isabel noted that being in the Experiential Anatomy course gave her confidence: "You come to know about knowing in talking about what you know; it was a fabulous process because it made me feel like I was an authority of my own experience" (Follow-up Interview, 10/23/05). While Isabel knew she was still learning how to learn about her body, she felt the class established a point of reference for her to continue this process.

For many of the students, the courses also comprised journeys in exploration and reflection. As Roberta wrote:

The spine as a column of support – an idea to let the skeleton do its own work. No imagery, just allowing the structure to be the under-girding that it is... My head felt secure and safe and I didn't let gravity overpower me nor did overcompensation allow the muscles to inhibit movement. It felt easy and trustworthy. (Journal Entry, Experiential Anatomy 04/08/05)

While Roberta was discovering many things about her body, there was no mention that these discoveries affected her dancing. However it is clear that her perception of her body, described by words like *easy and trustworthy*, seemed novel to her.

Regarding her experience of being in the course, Gayanne wrote, "Being in my body means bringing focus toward my body, both internally and externally. It means visioning images/objects to help me with any movement possible" (Journal Entry, Experiential Anatomy, 03/04/05). Katie noted, "I explore and discover things about my body that I may never have thought about before. This course helps to make more sense of instruction in other classes. It is helping me to be more aware and into my body" (Journal Entry, Experiential Anatomy 03/04/05). And, following the class discussion at mid-term, Marta wrote in her journal:

Honestly I did not know that this class would touch on so much specific information. [The content of the class has brought so much to the surface] about the hows and whys of my body's structure.....I have realized that to "be in your body" reflects somatic knowledge. The infrastructure [is just as important] as the outside. (Journal Entry, Experiential Anatomy, 03/04/05)

Other dancers reflected on a more personal level. As Amye contributed, "I am obtaining information about MY body and MY ways of using my body to execute movement. I am also learning that not one body is exactly the same and we all work in different ways" (Journal Entry, Experiential Anatomy, 03/04/05). And Dani wrote, "The

information presented in this class is ‘kinesthetic’ so I am learning it on a deeper level” (Journal Entry, Experiential Anatomy, 03/04/05). Dani and her classmates were receiving information about the body that they processed through their bodies, through their movements and through their self perceptions.

As the distinct voices in this section suggest, the students were 1) receiving information about their bodies, 2) developing contexts for thinking about their bodies, and 3) thinking about their dancing. They were also thinking about their thinking. However, while the dancers processed the information in different ways, did they really take ownership of what they were learning? During the courses, I was never sure how deeply the dancers were willing to explore the concepts or explorations. In fact, based on the follow-up interviews, it seems that dancers only retained the information in a general sense (Summary, Follow-up Interviews). Yet, the information had value for the dancers.

<sup>19</sup> Each dancer took something away from the class, whether it was temporary or permanent.

#### Journals and Interviews: Documenting the Dancers’ Experiences

Information about the dancers’ experiences derived from 1) in-class and follow-up journal entries, in which the dancers recorded observations and thoughts about their experiences in the classes; 2) mid-term interviews and follow-up interviews concerning

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<sup>19</sup> Upon review of a draft of this chapter, Linda Caldwell, one of my committee members offered this insight. “It might be like anything you learn – it takes time and specific instances to which you can relate it. I remember being a horrible turner (I would practice and practice – nothing). Then I went to some class and the teacher asked us “why do people (not dancers, but people) need to know how to turn?” All of a sudden, turning became a totally new process and, even though my formal turning (pirouettes, etc.) are still nothing I would want to show off, finding new ways to turn for a clear purpose became very exciting for me!” (Personal Communication, 10/10/06)

the dancers' experiences in the courses; and 3) my observations of individual classes and the courses as a whole. Viewed holistically this information provided a window into the dancers' experiences, offering insights into how they were processing the various aspects of the courses. These experiences included the synthesis of the anatomic and somatic materials, the effect of touch, imagery and work with partners; how they were processing this information immediately; how they reflected on the materials and experiences; and how all of these experiences might inform their dancing.

Among the notable developments revealed through the dancers' written and verbal reflections were the many ways the dancers were trying to understand, interpret, and integrate the information they received in class. Not only did each dancer assimilate and apply the information differently, but, in many instances, the dancers' experiences also changed throughout the semester and with the passage of time following the course. Each dancer was filtering information and sensation as an immediate experience and then through reflection. The dancers were also receiving information from their bodies – information they did not really have the language to be able to fully describe.

Most of the students were familiar with the process of reflexive writing and yet the experiences associated with this documentation were variable. For example, writing was a powerful tool for one student. Cierra wrote:

Suddenly I felt I was oozing across the floor rather than going from position to position. What helped me was the feeling of the greater trochanter and pubic bone pulling my legs and pelvis through the combination rather than trying to muscle my way through. (Journal Entry, Experiential Anatomy, 01/29/04)

This detailed development of the exercise in Cierra's journal entry may have been a description of what she felt, or perhaps a way to re-experience the sensation through her vivid writing. In either case, the process of writing augmented the original exercise.

In addition to writing, several of the dancers sketched in their journals. During the mid-term interviews, when I asked these students about their sketches, they all replied that sketching enabled them to document or record the visual representations made in the class. However, for two dancers in particular, the attention to the visual organization of the writing on the page, accompanied by sketches and caricatures, appeared to be a part of *how* they were processing the material. Drawings augmented the sensory information and anatomical data that the dancers could not find words to describe.

Regardless of the conventions each dancer used, clearly the journals provided the dancers a mode for negotiating "self" in a variety of ways: artistically, analytically, or simply as engaged and interested observers. The journals gave the participants voice. Although a few dancers consistently contributed to the conversation in each course, and all would reply if their answers were sought out, many preferred not to share their thoughts, feelings or questions aloud. Yet the quiet students often 'spoke' volumes in their journals; journaling appeared to be a more comfortable means of communication for these students. And while the journals served a curricular function, they also offered dancers time and space to process their experiences and to record their ideas.

### *Language and Integration*

At the beginning of each semester, the students dutifully incorporated the anatomic terminology and concepts in their journals. But it was clear from the careful

crafting of their entries, seen in the juxtaposition of the anatomical language with their free writing, using this language required extra effort on their part. As each semester proceeded, some of the students continued to integrate this terminology, freely and extemporaneously, into their journal entries while other dancers dropped the anatomic language completely.

Beyond the constraints of using the terminology they were learning, the dancers wrote about and discussed how understanding the anatomical information was beneficial for understanding certain aspects of their training. In some instances, whatever variation of the language they chose, use of the terminology seemed to coincide with or help the dancers express new awareness in, or of, their movement. As Janelle, one of the dancers in the 2005 Experiential Anatomy course wrote:

I'm becoming more aware of how my legs are connected to my back and how when one body part is ailing, the target area for my attention may actually lie somewhere else. I am finding that turns, stretching, and spiraling may be difficult for me because of tight hamstrings. (Journal Entry, Experiential Anatomy 03/09/05)

As an example of how terminology was integrated into the course, the focus of a class during Ballet II was joint motion at the hip. I explained the structure and function of the hip, augmented by demonstration on a skeleton at the beginning of class; this information was incorporated directly into the vocabulary and technique presented during the rest of the class. This approach enabled students to add conceptual information to vocabulary they already had been introduced to. For example, in one class, I demonstrated rotation in the thoracic spine that supports *épaulément* on the skeleton. The

concept, explored in movement and then associated with the vocabulary, épaulément, was then incorporated into the rest of the class.

As another example, in the Introduction to Dance as an Art Form course, I devoted a day to understanding and sensing how the movement of the scapula facilitated arm movement. I guided the dancers, working in partners, through explorations of various ways the scapula moves, or responds to movement, and then we applied this information and sensation to port de bras at the barre.

Both of the above cases demonstrate that the dancers were able to immediately integrate the concept in the body, although, I did not have an opportunity to observe the long term effects of carrying these sensations through the class or into a different class. Nevertheless, I feel that the dancers' experience of exploring the movement of the spine or the scapula was valuable for them, even beyond their descriptions of what they had done. As I wrote in a memo, "At the very least, the dancers were more aware of their bodies for a brief period, and they were learning a language to communicate about and reflect this information" (Researcher Journal Entry, 06/01/05).

And the communication was not limited to the classroom settings. I also observed several informal conversations, regarding the courses and the students' experiences, which took place before and after class, in other courses, or even away from the dance environment altogether. Although these discussions were not documented, the fact that discussion was taking place was much more important than if I had the opportunity to observe or analyze it. The dancers were finding their own ways of processing the information and experiences from the courses.

## Somatic Integration

In each of the courses used in this study, the dancers were introduced to somatic elements and ideas – information about the body, experienced in the body. In addition to Constructive Rest they were introduced to Klein Technique<sup>20</sup>, elements of Bartenieff Fundamentals and ideas from Body Mind Centering®. The dancers experienced and learned about, conceptually and in practice, somatic exploration in addition to the detail of the anatomic structure and function of their bodies. This was the students' first experience with processing their bodies somatically.

### *What Is Somatics?*

Somatics,<sup>21</sup> like imagery, is a term that encompasses a wide range of definitions, and in this study it was introduced to the dancers in both direct and indirect ways. Definitions of somatics as a discipline and somatic approaches to the body, experiencing the body away from technical dance requirements, were important components of the courses used in the study.

I introduced the concept of somatics on the first day of Introduction to Dance as an Art Form. Most of the students had never heard the term, and those who had did not have a clear idea of what either the application or relevance of this concept to them could

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<sup>20</sup> Klein Technique™, developed by Susan Klein looks at effecting deep changes in an individual's movement patterns, which become integrated into their entire being. Sarah Gamblin, the co-teacher for the Experiential Anatomy courses studied with Susan Klein from 1989-2000. Her most focused study was from 1989 to 1993.

<sup>21</sup> The term somatics was first introduced by Thomas Hanna in 1972. Described by Hanna, somatics is the observation from the "inside out, where one is aware of feelings, movement and intentions, rather than looking from the outside in" (Quoted in Fitt, 1995, p. 341).

be. I asked the dancers simply to internalize or experience what they were doing in the class; my goal was that by the end of the semester each student would develop his or her own understanding of somatics. Although at the end of the semester when we discussed somatics, there was a wide range of interpretations, all were linked to a common model – somatics as being *of the body*.

Melanie, for example, described somatics, or being *in* her body, as going from tactile to sensory or sensed experience. She demonstrated this distinction with a leg swing, relating what she described from feeling; the “rhythm and sweep of brushing her leg outward and upward” as inside her body. She conveyed this, not with her words per se, but with the quality of her movement and the change in her voice as she spoke. Yet, in our mid-term interview, Melanie also indicated that sometimes somatics related to “her head.” She knew she could broaden her focus when she was moving, to encompass more than just thinking about the steps (Mid-term Interview 11/05/04).

In contrast to Melanie, Brendan described somatics as first learning the phrase of the movement and then using muscle memory; once she had learned the sequence, Brendan could incorporate more specific information about the body. Monique defined somatics in terms of the concepts she had been introduced to – for example “head/tail”<sup>22</sup> was a very clear way for her to think about integrating her torso in her movement. Monique stated that she could engage with somatics when head-tail was the focus. And

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<sup>22</sup> Head/tail is a concept introduced in Bartenieff Fundamentals as a way of thinking about a spinal pattern of connectivity. Peggy Hackney discusses this concept in her book, *Making Connections, Total Body Connectivity through Bartenieff Fundamentals* (2002).

Diana, detailing her in-class experiences exploring the different sections of the spine wrote:

Today I learned the key points of my spine...from swishing the sacrum, motorcycle interpretation of the ribs; we found our sacrum and 7<sup>th</sup> vertebrae. Learning the locations of the sacral, thoracic and cervical points will keep me aware of the differences. This keeps my body and posture in a flowing state. This feeling will be useful to me because I will now be more aware of the key points in my spine and what they are doing. I will now be able to keep a good standing posture which may prevent my lower back from hurting. (Journal Entry, Introduction to Dance as an Art Form, 10/03/04)

While we addressed somatics explicitly in Ballet II and Introduction to Dance as an Art Form, in the Experiential Anatomy course, comprised mainly of graduate students, I assumed that the students had encountered this language in their undergraduate dance programs. Therefore defining somatics was not our primary emphasis. However, understanding the somatic concepts seemed as novel to some of these first year graduate students as it did to the dancers in Introduction to Dance as an Art Form. In general, it seems clear that for many of the dancers in this study this was the first opportunity to discover, and articulate, what the term “somatic” meant. For example, after the first class, Miche, one of the graduate students in the 2004 Experiential Anatomy course, wrote, “After the discussion of body reference points and the hands on application of locating the top of the head, I felt a new awareness of verticality” (Journal Entry, Experiential Anatomy, 01/22/04). Certainly this experience included a change in perception about the body and its spatial orientation. For Miche, the experience was significant.

## *Breath*

One of the cornerstones of the somatic information is breath. Most of the dancers knew that breathing was important in dance, but few of them felt they knew how to breathe correctly, or that they were aware of how breath shaped and supported their movements. In fact, it seemed that the students knew little about incorporating breath with their movements and their dancing. Thus, breath and breathing were important topics in all of the courses, even in Ballet II.

Early research in exercise physiology established that exhalation should occur during the exertion.<sup>23</sup> While singers and athletes are trained to use diaphragmatic or belly breathing,<sup>24</sup> until they are introduced to modern dance or Pilates,<sup>25</sup> dancers, are not taught to incorporate breath into their movement. However, many dancers exhale as they execute a phrase, center themselves, or when finishing a combination.

The idea of incorporating breath with their movement was quite new for the dancers in the Introduction to Dance as an Art Form course. As a result, classroom discussion returned to breath several times during the semester. Many of the dancers commented on breath during the mid-term and follow-up interviews, noting that they had become much more aware of the importance of breath. Yet each dancer had integrated breath into her movement in different ways. One dancer discussed using breath in plié

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<sup>23</sup> Exhalation with exertion was important for protecting the heart when moving heavy weights to prevent a change in blood pressure. See Wilmore & Costill (2004), p 234. However, in a dance context, commensurate exertion would be limited to male dancers lifting their female partners over their heads.

<sup>24</sup> Diaphragmatic breathing is accomplished by actively pulling the diaphragm down on the inhalation. In doing so, the abdomen becomes extended, but as Noble (1986) discusses, this facilitates a deeper breath.

<sup>25</sup> Pilates exercises ask the dancer to use an inhalation for the preparation of movement and early movement exertions, and to use the 'scoop and hollow' of the exhalation to finish the exercise and move into recuperation.

and partnering, while another noted that she made a point to incorporate breath into her movements in general. A third attended to her breath more during fast dances and transitions than at other times (Summary, Follow-up Interviews).

The dancers discussed the integration of breath in their dancing, both as a practice and as a philosophical approach. Terry noted that she thought about breath more easily when the movement was slow, adding that “breath adds to the actual movement flow” (Follow-up Interview, 04/20/05). Terry applied her understanding of breath directly to ballet technique: “If I breathe I know I can balance – both the inhale and exhale are required” (Follow-up Interview, 04/20/05). Monique described breath as an area of “positive self talk. I focus on breathing and dismiss the other things I am thinking about” (Follow-up Interview, 02/20/05). Melanie knew that while she didn’t use breath effectively, she correlated her ability to “breathe naturally within a movement as being representative of having it right. I know if I could use breath more effectively, I might find some release in my joints” (Follow-up Interview, 04/05/05). These comments elucidate the transitions the students in Introduction to Dance as an Art Form were experiencing. As the focus of their training shifted, their perceptions of themselves as dancers evolved.

While breathing was central to several of the Introduction to Dance as an Art Form classes, in the Experiential Anatomy courses we devoted only one class to discussing and exploring breathing. After introducing the diaphragm and the muscles of the abdomen and ribs, we discussed different approaches to breathing. Part of this class included discussing different paradigms for incorporating breath and movement; for

example, and whether to inhale for support and exhale for compression or the reverse in their Pilates training.

Many of the participants in the Experiential Anatomy courses commented that understanding breath was essential for understanding movement. Although they could see the link between breath initiating and supporting movement, only Cierra talked about how she linked breath to her internal sense. During the mid-term interview Cierra described using breath to send energy through her body; she had begun specifically choreographing the breath with specific movements, and felt that this had changed her dancing. Cierra wrote in a journal entry, “My breath pulls me upward into an over curve, while at the same time grounding me. I send my breath to the farthest points of my extremities, my fingers, toes, even my hair” (Journal Entry, Experiential Anatomy, 02/20/94).

Miche discussed how breath was closely linked to movement, particularly in ballet. She wrote:

I had the most amazing ballet class on Tuesday. I used breath to propel everything I could. I let my breath inspire and motivate me...from a core that was not rigid, but fluid. It was incredible! I ‘danced’ an entire ballet class...breathing!!!! (Journal Entry, Experiential Anatomy, 02/26/04)

Melissa discussed both how she was taught to breathe and how she was teaching breathing. In her recent studies Melissa had discovered that non-Western forms of dance use different postural models and muscular patterns in breath. This expanded perspective on breathing, enabled her to link breath and expression. As she wrote in her journal:

It is obvious that the mind and body are not separate things, but the one aspect that I feel shows that the body is deeply integrated is the connection

between breath and emotion. Looking back, I can't remember a time when a strong emotion (did not) affect my breath pattern. I now bring my awareness to it, particularly when I feel stress or anxiety. I know that they are so closely tied, that I can change my emotional state by changing my breathing pattern.<sup>26</sup> (Journal Entry, Experiential Anatomy, 03/01/04)

Overall, the use of breath was an important concept for the dancers to integrate with their dancing. Amye, discussing how breath helped minimize tension in her body, wrote:

I wonder why I create excess tension in my body when I don't breathe or when I force the breath out. I have this vision that even the most dynamic movements can feel like you[re] dancing off a cloud in your body, if you just grasp the concept of releasing extra effort and tension throughout the body – what an image to play with! (Journal Entry, Experiential Anatomy, 03/25/05)

### *Changing the Breath Pattern*

In both sections of the Experiential Anatomy class, the dancers experimented with breath in specific exercises. For example, the dancers were asked to modify their breathing patterns during a roll down exercise.<sup>27</sup> When I learned this exercise, the roll down was accompanied by exhalation and the roll up by inhalation. The feeling of emptying during the exhalation facilitated the forward flexion, and the inhale helped the dancers feel the lengthening and widening of returning to the vertical position. This was

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<sup>26</sup> It is important to mention that a few dancers in the study felt there was conflicting information within the TWU Department of Dance regarding breath; this ambiguity was frustrating for them. One of the participants in the 2004 Experiential Anatomy class, for example, felt that while her previous school had emphasized the use (and sound) of breath, the TWU aesthetic did not favor audible breathing. She was frustrated by having to shift away from this deliberate use of breath in her current training. This dancer was confused by the dance department's commitment to Pilates, a practice that relies heavily on breath, because her impression was that in some classes she had taken at TWU breath was not integrated or emphasized in the curriculum.

<sup>27</sup> A roll down, incorporated at the beginning of many modern dance classes, is a way of stretching the back and legs through slow spinal articulation.

similar to how most of the participants had been taught or had become accustomed to performing this movement.

However, when the dancers were asked to reverse this pattern and inhale as the body lowered, the following observations were elicited (the voices from the 2005 Experiential Anatomy class represent the 2004 class equally). Roberta wrote, “Inhale down/exhale up felt limiting, but the roll up was much more grounded.” According to Gayanne, “When I exhale going down, it feels nice, I can’t explain, when I inhale going down, my organs feel crushed, but coming up when exhaling allows me to feel more secure and grounded. Janelle revealed that “rolling up felt very relaxed, more than other methods she had tried. And Belinda wrote, “Today I liked the new version” (Journal Entries, Experiential Anatomy, 03/04/05).

Although we do not have to consciously attend to breathing, by attending to the sensation of breathing and linking this feeling to a familiar activity, many experienced the roll down in a completely new way. If nothing else, the exercise drew the dancers’ attention to their breath.

As a dancer and a teacher, I see breath as a physiologic process, an organizing principle and an element of artistic and aesthetic forms. As a researcher, I also see breath strongly linked with emotion. As I detailed in a journal entry:

I think for some of the dancers just increasing their awareness of breath and how it coordinates and coincides with movement has been a physical discovery that they have not found the words to express or the time in which to speak about it. In the body work sessions of the class, particularly between partners working with each other, there was a subtle but noticeable coordination of movement and breath in the focused stillness of the exploration. (Researcher’s Journal Entry, 12/10/05)

Breath was the most tangible and accessible somatic concept the dancers considered within the courses. In their reflections, the incorporation of breath with the movement seemed to be natural and logical; this concept integrated easily with their ideas about movement. In fact, it seems important that once the dancers' attention was drawn to the incorporation of breath with their movement, their perceptions of the movement changed completely.

### *Emotion*

If, as Damasio asserted, emotions are based in physiologic responses,<sup>28</sup> a change in emotional state causes external manifestation. During many of the interviews, particularly those conducted at mid-term, when the dancers discussed some aspect of the class or discovery in their dancing, there was an observable change in their bodies. I was aware during these interviews, as well as in the journal entries, that the dancers were remembering and describing things that were very personal and sensitive. Some of the dancers became excited when telling a story; others were overcome by vocal tremors or suppressed tears while discussing sensations or experiences. All of the dancers were respectful and composed, but clearly, talking about what they were learning and what they were experiencing stimulated some sort of emotional response.

One possible reason for this emotion was that the dancers were reflecting on how their bodies conformed to, or met, technical dance requirements or somatic reflection.

This question asked the dancers to enter into a territory where they felt quite vulnerable.

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<sup>28</sup> Damasio (2000) and (2006) has discussed the development of emotions as a result of chemical and neurological signals that communicate with the brain, although we can modify the emotion through volitional thought. Damasio proposes a body-loop hypothesis which identifies the perception of emotion in our bodies during the experience of an emotion.

As Jeanne discussed, “Accessing and studying our bodies was emotional. Finding out that my turnout is limited, that my feet are flat, that I have less range of motion than my classmates, this was hard to process” (Follow-up Interview, 10/24/05). However, it is worth mentioning that another factor affecting the dancers’ emotional well being also related to a larger context: most of the students in the Experiential Anatomy class and Introduction to Dance as an Art Form were first year at TWU students. No doubt these dancers were trying to understand what was expected of them as dancers and as individuals in the program. And, although the dancers felt free to express themselves, Sarah and I, as instructors, did not encourage the dancers to access the emotional aspect of this work. Yet it appeared that the dancers were most involved with the class when they were dealing with these issues that were sensitive for them.

Other negative emotions, particularly in the form of stress, also affected the dancers. As Melissa wrote, “I feel like my proprioceptive awareness is lowered because of heightened (even if forcefully) awareness on other tasks. How much is bodily awareness affected by daily tasks, or stressful times? Is that why people have so little bodily awareness” (Journal Entry, Experiential Anatomy, 04/15/04).

Despite Hanna’s assertion that “somatics is a first person view, where one is aware of feelings, movement and intentions,”<sup>29</sup> clearly the dancers’ experiences were not limited to movement contexts only. Deeply embedded in everything we do is desire, intent, and the need for affirmation. Dance is no exception to this rule; surely emotion is clearly a part of what dancers know in their bodies.

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<sup>29</sup> Hanna, 1995, p. 341

### *Processing the Sensory Information*

As the previous sections have made clear, the dancers were negotiating, integrating, and processing a great deal of information. They were being asked to name and locate specific landmarks in their bodies based on visual and tactile data, to “feel” these landmarks, and to consider how this information could apply to their dancing. It was clear that the dancers were processing the information and their experiences on several levels. At one point, for example, they were observing bones and muscles or different body parts, which led to the observation of their bodies; they then observed others’ bodies; and finally they reflected on their observations.

One of the levels on which the dancers were processing information was physical: the dancers were asking, “How does this feel in my body?” I will term this exploration as *sensory*. For the most part, the sensory information the dancers were processing, particularly with the partnering work, seemed to be limited to the explorations themselves. These explorations were usually completed on the floor, but when the dancers stood up to apply their sensory experiences to a particular task or movement, rather than remaining with feelings they were receiving from their bodies, the dancers confirmed what they were feeling by watching their movements in the mirror. As the semester(s) progressed, students in the Experiential Anatomy courses learned to stay with sensation longer, but as soon as an activity evolved into a specific dance movement, the dancers often reverted to using visual feedback to gauge their performance.

For example, one day, striving to find more release in the hip joint, the dancers worked with partners mobilizing the femur. At the end of the class, while everyone else

was rushing out the door, one of the participants went to the ballet barre to “test” the results with some simple leg swings. Interestingly, this student chose a place in the room where she could observe the leg swing visually – she wanted to check the result of the new sensation she was having. Although the student did not write about this, during the mid-term interview I asked her if she remembered going to the barre and doing the leg swing. She replied that she had recently received a comment about lifting her hip in her ballet class and she wanted to see if it was still happening after working with her partner. She had clearly experienced a difference (likely before, during, and after the leg swing), but she made no reference to this in her journal or unprompted conversation. What remains unarticulated by this dancer has to do with *what* information she was getting from her body that prompted her to attend to and apply the sensations she was processing during the leg swing.

### *Is Sensation Lost in Interpretation?*

Although the dancers were clearly receiving information from their bodies in the somatic work, the integration of this sensory information was difficult to enact or describe. During the 2004 Experiential Anatomy course, Sarah and I asked the dancers to transfer the anatomic and somatic information to their technique courses, but we did not provide any specific guidelines. The dancers experienced varying levels of difficulty with this process. Although many commented that they could not think about, or attend to, their bodies in light of the demands of a dance class, in a few instances the dancers did connect what they had been learning in the courses to their dancing. Even in these cases however, most of the dancers found it difficult to describe these points of intersection.

While many of the dancers stated that they were informed by their bodies or by sensation when dancing, they did not use the anatomic or somatic language presented in class to discuss these experiences in any detail. Instead, in their weekly journals, the dancers used phrases such as, “I feel that” or “I sensed,” which were often set apart from statements like, “I think.” When asked to convey what they meant, most of the students could define the words (feeling, sensing or thinking) but it was never clear that they could articulate what those terms meant in their bodies.

Indeed, teasing out these semantic differences is difficult. Yet it appeared that when a dancer used the phrase, “I sensed” or “I felt,” she had reflected about her experience. Statements that described thinking, for example, “I thought,” “I wondered,” or “I reflected,” came from observing or experiencing sensory information. However, by separating these actions in their writing, were the dancers creating (or falling into) a false separation between thinking and feeling?

Isabel’s journal entry exemplifies this dichotomy. Reflecting on her participation in the rond de jambe study, Isabel noted that while she had learned about ballet through technique and performance, she felt she had learned about her body through the experience of dancing. She asserted:

[L]earning anatomy and physiology is an additional layer, adding depth and truth to what I do and how I move; they can also provide doubt in the techniques that are available or change certain tendencies I find are not anatomically aligned – how interesting it would be for a person’s knowledge to be in anatomy and then layer an understanding of ballet on top of that knowledge. (Journal Entry, Experiential Anatomy, 02/12/04)

While Isabel was separating learning from experiencing, she viewed the anatomic information as both a complement and a challenge to the dance knowledge she accessed through movement. What seems to be lacking for Isabel, and the dancers in general, is a vocabulary that enabled them to articulate the processes they are using to integrate their experiences with the information they were receiving: the integration of theory and practice.

### The Importance of Taking/Making Time

The strength of the data for this research lies in the fact that it both represents the passage of time for the participants and was collected over time. Each student processed the anatomic and somatic information throughout a semester-long course. During this time, all the students made significant discoveries about their bodies and learned to express what was happening to their awareness and understanding.

While the course work introduced and explained somatics, in reality, simply the existence of a scheduled class during the semester, in an environment that values somatic work, helped the dancers realize how an experiential approach interfaced with the other courses they were taking at TWU.

The Experiential Anatomy courses, which met on Friday mornings for two hours and fifteen minutes, offered a different experience for the students. Contrasting with the hectic Monday through Thursday schedule of technique courses, Friday required a different energy. The mood of the classroom was relaxed and the tempo was slow; there was no music to follow or rhythmic structure for the exercises. Sarah and I modeled an indulgence in time through our measured and relaxed presentation of the material

providing space and time for exploration in a comfortable and relaxed atmosphere. The students quickly acclimated to this temporal approach and engaged actively in the process.

Nevertheless, the students were challenged by some of the ideas presented in the course, by relearning or trying to connect with the vocabulary they were asked to adapt, and by the volume of reading assigned in preparation for each class. Isabel, for example, wrote:

While it was hard to learn to speak the language [of anatomy] clearly and quickly, it was neat to break down what we do in dance related to anatomy and physiology. I guess that is the purpose of these types of classes.  
(Journal Entry, Experiential Anatomy, 02/05/04)

Miche, a classmate of Isabel's, agreed: "Little by little the information sinks in if I take the time to address it. The class is helping me think about other things - apply imagery"  
(Journal Entry, Experiential Anatomy 02/20/04).

Students in the 2005 Experiential Anatomy course wrote mid-term statements about what they had been learning, what function they thought the course served, and what their experiences had been so far. Roberta wrote, "The class gives me the time to do the imagistic experiments to process the information. The journaling allows me to bring my mental/physical observations out of the abstract and into the concrete" (Journal Entry, Experiential Anatomy 03/04/05). Molly wrote in her journal (but did not share aloud with the class):

I am now more aware of how and why things happen in my body. I value the time we have to just focus on one concept in our exploration time. Even though we talk about the body in other classes – it is much more difficult to work on it while trying to remember the phrase, etc. In the

Friday class we are afforded the opportunity to specifically focus. (Journal Entry, Experiential Anatomy 03/04/05)

And Belinda wrote, “I have been able to identify my contents and container – I am able to identify unfamiliar places and explore. I am finding this communication almost (if not equally important) as my breath” (Journal Entry, Experiential Anatomy, 03/08/05).

While these three dancers were all discovering different things about their bodies, each recognized that taking the time to experience the anatomic and somatic information in the course enabled her to learn more about her body and herself.

Nevertheless, several dancers in Experiential Anatomy expressed difficulty integrating the sensory awareness developed in the course with their other technique classes. Some attributed this disconnect to not having enough time (presumably in their dance careers, but perhaps also in the semester) to deal with all of the things they were discovering. As Bridget wrote, “The information in this class is something I plan to carry with me throughout the rest of my life. Unfortunately I feel like I don’t have enough time to process all of the information as finely as I would like to” (Journal Entry, Experiential Anatomy 03/04/05).

The information and experiences from the courses will continue to change for these participants; it will rise and fall in their consciousnesses as it manifests in sensation. Information that was, and is currently, important to the dancers will be accessed, reflected upon, and likely modified as they go forward in their careers as dancers. Without exception, the dancers’ experiences changed over the course of the semester and in the time that followed. Each participant learned something about her body in the course.

Some of the dancers applied what they learned directly to their dancing; others reviewed or revised their ideas about movement. Still others only processed the anatomical information in their bodies and found that to be sufficient.

### Summary

In this chapter, I have discussed the different ways anatomic and somatic information was introduced and utilized in the courses, as well as each dancer's singular experience in the courses. And while the dancers processed these experiences quite differently, each expressed a level of enthusiasm and engagement from each. In the next chapter, I will discuss how the dancers found both general and specific applications for the information from the class, how they connected this information to larger contexts, and how these discoveries affected their dancing. In addition, I will present how the dancers discussed "knowing in their bodies."

## CHAPTER V

### MOVEMENT AS A CONTEXT FOR KNOWING

The previous chapter explored the dancers' experiences in the somatic classrooms and how they utilized and applied this information. This chapter moves from the environment of the courses used in the study to how different individuals integrated the information and experiences from the courses. This includes 1) how the dancers incorporated the course information and sensory work with their dancing, 2) how this integration developed their confidence as dancers, and 3) what experiences related to performance on stage, as this was the goal of many of the dancers in the study. I close the chapter presenting what the dancers thought about their thinking, about their bodies, and their dancing, and how they interpreted the question, what does it mean to know something in your body?

#### Integrating the Information from the Courses

Today we really focused on our body and how it moves in relation to other body parts. We felt the weight of our head, rib cage and pelvis. It was really interesting to feel these parts on other people because you could really visualize the actual skeleton and how it was moving. (Sophie, Journal Entry, Introduction to Dance as an Art Form, 09/20/04)

As the previous chapter illustrated, most of the dancers found the information presented in the courses stimulating or interesting within the context of the class work and explorations. This happened with the graduate students in the Experiential Anatomy courses and the undergraduates in Ballet II and Introduction to Dance as an Art Form.

However, did the experiences in the courses facilitate learning beyond the immediate course requirements? This section explores how the dancers were beginning to connect with the information about their bodies with their dancing, and balancing the anatomic and somatic information with other courses they were taking at the time.

While the focus of the courses used in this study centered on anatomic information, the intent of each was to enable the students to integrate this information by feeling or sensing the information in their bodies. For some of the dancers, this proved to be as challenging as learning the names of the bones and muscles. However, this was not surprising. First, the dancers had been trained to pay attention to movement, not to their bodies. Many of the dancers realized that they had learned complex movements, not from physical exploration of a concept, but from visual patterning or by following external cues. This mode of learning was complemented using technical vocabulary or vernacular terms. As a result, many of the dancers automatically assessed the accuracy of their movement visually instead of a relying on a kinesthetic or felt response.

Secondly, none of the dancers reported previously learning a language to describe these sensations clearly. Thirdly, many of the dancers were confused by or uncertain about the information they were receiving from their bodies and *how* they could or should use the information they were receiving. Finally, while most of the participants understood the value of working through the information regarding movement or shape somatically, they preferred visual information to the sensory information, for example, checking a position by looking in the mirror in a dance technique class.

Several of the dancers discussed using visual information as an access point for determining the movement's "correctness." Miche discussed how she decided what feelings to internalize when determining if a movement was correct. For example, if a leg swing looked appropriate, she focused on linking the associated feeling with visual information (Summary, Mid-Term Interviews). Janelle, a student in the 2005 Experiential Anatomy course, stated that particularly in ballet she checked herself in the mirror to confirm the sensations associated with a movement or action that "felt" right. She viewed this as a way to confirm a position of her body or of a particular line (Summary, Follow-up Interviews). This type of affirmation, which is quite common, unfortunately predisposed the students to question the somatic information they were receiving from their bodies in lieu of a two-dimensional visual representation. The information the dancers get from their reflection in the mirror gives only a thin slice of information upon which many judgments are made.

Part of the value of integrating the anatomic and somatic information for the individual dancer was to develop trust in what they were feeling in movement. However, as many of the participants had only minimal experience acknowledging sensation, they were not certain that they should have confidence with this information. Rather, they noted deferral to the authority of the feedback given from others (Summary, Follow-up Interviews). However, as the dancers spend more time attending to their bodies in movement—as opposed to technique or position—would they learn to trust and access this somatic feedback as much as the visual?

Some of the dancers used the anatomical information from the course to understand how their bodies were capable of fulfilling physical demands that dance placed on them. In this way they were using the information from the course literally rather than metaphorically to describe and locate what they were experiencing in their bodies. As Roberta wrote, for example:

There was less sensation through the lumbar area when doing the roll down and up. Also my shoulders tend to roll forward when doing this action and sometimes I forget to let my scapula slide down and back into place when rolling up. It made me think that I might be muscling in the upper back to feel the sequential roll down. (Journal Entry, Experiential Anatomy, 03/04/05)

In this entry, Roberta focused more on the sensation than on outside feedback. Using concepts and language from the course, she found a way to keep her analysis at a sensory level, which she accompanied with reflection.

#### *General Contexts for the Information*

As the dancers contemplated and explored concepts that had been introduced in class, many of them also linked these concepts to activities outside the courses. Many of the dancers reflected on the information on the weekends, while others tried to actively incorporate the information into other technique classes or activities they were participating in. Within each of these strategies however, there was tremendous diversity.

Amye, a graduate student in the Experiential Anatomy course, wrote about how she used information from the course to help her attend to her body: “I woke up stressed and felt tense and achy. After getting showered and dressed, I laid down [on the floor]

and put my legs up on the wall and slowly waited for my quads to release and relax” (Journal Entry, Experiential Anatomy 02/13/05). In the same journal entry Amye also wrote about “thinking about my sitz bones shooting straight down while pushing the cart down the aisle at the supermarket” (Journal Entry, Experiential Anatomy (02/13/05). Dani was using the information from the course to confirm connections between her many interests:

It is still fascinating to see how this all relates.... Life, dance, Pilates, anatomy... the crossed lines and blurred boundaries are intriguing. Learning how to scoop my belly without muscular force has aided in breath support, in facilitating movement and in my posture... (Journal Entry, Experiential Anatomy, 03/04/05)

Many of the dancers from Introduction to Dance as an Art Form and Experiential Anatomy also practiced constructive rest outside of class, finding the restorative benefits to be a worthy investment of their time. And a few of the dancers used their boyfriends as subjects - but not without some reservations. For example, Molly wrote, “I employed my fiancée as my partner in this exercise but I wondered if he would be able to sense the muscle tension without the practiced hand of an Experiential Anatomy student” (Journal Entry, Experiential Anatomy, 03/30/05).

In the journal entries that follow, the philosophical nature of the dancers comments reveal that they were connecting the course material to different situations and environments, and yet each made very different connections. For example, Isabel was very open to, and trusted, the information in the course; she invested completely in the process of trying to understand her body. In a journal entry from late in the semester she wrote:

I am at the very beginning of understanding something about pli  and my movement. I am not sure what I am learning just yet...I am simply aware that something is happening and I trust it to come to fruition in the near future. (Journal Entry, Experiential Anatomy, 04/21/04)

Belinda discussed how she could transfer the knowledge she gained from the course through application in other classes. She wrote in her journal:

After getting body, bone, and muscle organization in ballet, I was able to take this awareness and experiment with movements in modern. I was aware of the possibilities of my movement potential and felt I took more risks in really going to kinesthetic and somatic investigations. (Journal Entry, Experiential Anatomy, 01/28/05)

However for Dani, the focus of the course created a mix of emotions:

I hate it, yet I love it. I can't walk, or sit, or stand, or anything without noticing my bad postural habits....but it makes sense now – I understood before, but now it seems more....complete – a deeper understanding that is leading to greater body awareness. (Journal Entry, Experiential Anatomy 02/16/05)

Roberta wrote about her experience dancing at a regional festival away from TWU. "Two things became solid mentally for me while taking the master class: that balance comes from length and there is a width to most movement as well" (Journal Entry, Experiential Anatomy 03/24/05). Like Roberta, Janelle addressed balance and tension in the notes she jotted while observing an advanced ballet class:

1) What seem like easy principles, or movements/alignment [that] aren't so easily executed and 2) how disconnection of the soma manifested through tension/tensing keeps us from executing movement even though that tensing is done as a preparation for the movement. (Journal Entry, Experiential Anatomy 04/07/05)

Belinda, who rigorously applied the information from Experiential Anatomy to the ballet course she was taking, wrote:

I had a “aha” moment in attitude balance at the barre. I have been having trouble balancing in attitude at the barre, but I have been locating the correctness of the balance in the center combinations – I think I was visually imagining my bones like this [in her journal were drawings of right angles] – almost as if not allowing my pelvis and its contents to balance as well. I wasn’t even giving it a chance. But today I found it... (Journal Entry, Experiential Anatomy, 02/17/05)

While the dancers related to the anatomic and somatic information given in the course readily, many had difficulty taking this experience forward. For example, Melissa noted that while she was comfortable doing the somatic work on the floor, the translation to standing was difficult. “I want to be attentive to my body; what I have been working on the most is how to maintain the awareness and still be physical” (Follow-up Interview, 05/07/05).

It also was evident from the journals that the dancers were reflecting on the concepts presented in class on their own. For example, in an early journal entry Belinda wrote, “I find myself checking my posture—as I sit here and write, as I brush my teeth, I have begun to realize that thinking about it [my body] and being aware of it is as important as technique class” (Journal Entry, Experiential Anatomy 01/25/05). Dani wrote in the margins of her notebook, “Alignment—How has this knowledge affected your activities?” (Journal Entry, Experiential Anatomy, 01/24/05)

And some of the dancers reflected on the use of imagery. The following excerpts from Janelle’s follow-up interview exemplify the experiences many of the other dancers had:

I knew if there was something I needed to work on, I needed specific imagery – like a mantra. But the funny thing is that I don’t do that anymore. I think at some point the images become integrated... I don’t

have to repeat the image anymore to know what I am trying to get at. For me it is more imagining the shape and the sensation I want. I have to imagine that on my body – I have to imagine myself as fantasy ballet Janelle – if I imagine that my leg can go way up in the air. If I can imagine what that looks like and feels like – that helps me, but I don't do the metaphor thing anymore. I totally forgot about that. (Follow-up Interview, 10/23/05)

The experience in the courses gave all the dancers a framework, a set of ideas and questions and some terminology with which to evaluate their experiences dancing and their ideas about what dancing should or could be. The dancers were also able to use the information to make connections and see how the dance forms they were currently studying linked up to a larger context.

#### *Specific Discoveries and Relevance*

In addition to the general applications the students were discovering, there were examples of specific application as well. For example, in the Ballet II class, Melanie wrote, “I knew that rotation initiated from somewhere near the hip but to understand exactly where it happens was useful” (Journal Entry, Ballet II, 02/01/05). Another dancer, Laura, fashioned a dual entry – one page was full of spirals; on the other page she wrote, “Today I felt exactly where my rotation comes from – it was very interesting. [O]nce I found out where my rotation was coming from I felt the whole combination a lot easier” (Journal Entry, Ballet II, 02/01/05).

Following discussion of the biomechanics of using a barre in ballet training, Toni wrote about the contrast between performing tendus in a ballet class with a barre and in a modern class without the barre. Both felt natural in their specific contexts, but “the idea

of doing tendus in a ballet class without the barre seemed impossible” (Journal Entry, Experiential Anatomy, 04/15/04).

In week two of the 2005 Experiential Anatomy course, Janelle wrote about the discovery of her lesser trochanter, and by mid-term, she was intrigued by the concept of swinging the ankle into relevé.<sup>30</sup> Challenging her own pre-conceptions about how the movement should be performed, she wrote in her journal, “Why can’t I get over my toes in standing? Does it have to do with my feet or my hamstrings?” (Journal Entry, Experiential Anatomy, 02/20/05) And Amye was beginning to link many of the concepts with problems she had been having with her body:

The whole body needs to be loose for me to execute a wide range of technique – especially jumping. If my upper body is tense and my lower body is loose, I am still causing a stop in my movement of energy. Possibly using the sense of gravity in my upper body will allow me more range of motion and weight shift in my pelvis and legs. After jumping Sarah asks us to invert – push our pelvis in the air. It was a nice reminder that all a jump is – is to lift the pelvis. (Journal Entry, Experiential Anatomy, 04/25/05)

Marta, like Janelle and Amye, was processing questions and sensations during the class:

When I allowed myself to be supported by the floor instead of gripping/tensing my muscles unnecessarily, my arabesque turn [was] sustained longer and felt smooth without hopping. While pushing into the floor with my supporting leg, I was able to lift without [dis] placing my pelvic area. In turn a smoother line of my limbs was presented. (Journal Entry, Experiential Anatomy, 02/09/05)

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<sup>30</sup> Swinging the ankle into relevé was an exploration taken from Irene Dowd’s *Taking Root to Fly*. See p. 39.

In this entry it is clear that Marta was employing a new approach to her dancing. The following week Marta wrote:

As soon as I started to do my extension, I noticed my supporting leg going into hyperextension, which is NOT good. This made me bring more control to my pelvis in turn loosening the quads of the standing leg. I hope I remember this in my next technique class! (Journal Entry, Experiential Anatomy, 02/16/05)

Rather than thinking of balance as a precarious adventure, Marta was using information from the course to help her develop a strategy for balancing.

Many of the dancers also discussed specific connections, modifications in how they were thinking about their bodies, and responses to new ideas experienced within the courses used in the study. As an example, the students were asked to consider a different paradigm for balancing, spiraling and turning—by thinking about their organs.<sup>31</sup> At first the dancers did not embrace the idea of moving from an organ, in fact, there was a brief period where they were uncomfortable with moving with this image. However, once they had experienced movement using this imagistic model, their perspectives changed dramatically (Summary, Follow-up Interviews). For example, moving from organs (e.g. from her kidneys or ovaries) intrigued Gayanne:

I am trying to experiment with moving from my organs or deep within. I almost have started using this when thinking to move with strength. (Which I have never done before.) It is so awesome to think of so many sensations that can actually help you do “movement.” (Journal Entry, Experiential Anatomy 3/05/05)

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<sup>31</sup> This approach was modified from Olson and influenced by Duhan’s *Job’s Body*.

Not only did the dancers experience different learning modalities, including incorporation of different images and ways for thinking about movement, but their experiences in the courses also changed over time. The dancers learned what to expect in the classes and how to engage with the experiential work, but they also developed a different perspective on their dancing. In reviewing the data, I wondered if the dancers' experience of movement at a bodily or somatic level would cause them to experience dancing differently.

Marta, a dancer from the 2005 Experiential Anatomy course, commented directly on this. "I must admit...I could not stand pliés as a younger dancer. Doing pliés was painful and never comfortable. [Only recently] did I begin to feel the advantages of this exercise...with correct alignment plies feel so much better" (Journal Entry, Experiential Anatomy, 04/19/05). In the Ballet II class, Carissa wrote, "I know I have gotten better at dropping my sitz bones in plié" (Journal Entry, Ballet II, 05/05/05). And Catherine wrote, "Attitude is not just one side of the body, it is a spiral in both legs" (Journal Entry, Ballet II, 05/05/05). It is worth pointing out that each of these observations were written at the end of a semester and have a reflexive tone, as if there had been ample time for the dancers to reflect on their experiences, internalizing the information presented in the courses. As these excerpts illustrate, many of the classroom experiences not only affected specifics movements, they also linked to larger ideas about movement and about the dancers' experiences dancing.

During an interview conducted eighteen months after the course, Isabel discussed "feeling her body moving in space and time" (Follow-up Interview, 10/23/05). She had

recently discovered that her shoulder placement had negatively affected her turning; she expressed astonishment that she had not figured this out before. However, upon reflection, Isabel commented that somatic work took time and that she was only able to make this connection about her body—and her dancing—when she was in an environment where there was no stress. Isabel realized a year and a half after finishing the course that she was the one who needed to make the necessary time and space in which to experience and understand her body.

### Beyond the Anatomic/Somatic Classroom

Last semester I was completely immersed in somatics, but now I am taking courses with a different focus. Each semester has been distinct; so while I have chosen not to use the anatomical or somatic language, I know I have retained some of the concepts and I am paying more attention to my body, but I am most interested in the physicality of being a dancer, of taking the somatic material to the next level. (Janelle, Follow-up Interview, 10/24/05)

During the follow-up interviews, it was clear that the dancers were in new environments where the courses had a different focus. The dancers had been introduced to new ideas, and their relationships to material presented to them in the courses had changed. Several students commented that during the courses, simply paying attention to their bodies enhanced the information about the body; one noted that this somatic approach took her beyond just the “shape of the movement” (Summary, Follow-up Interviews). Yet in the follow-up interviews with the graduate students in Experiential Anatomy, they talked more about performance and teaching than they discussed their perceptions of their bodies.

Meeting with the undergraduate students from Introduction to Dance as an Art Form during the semester following their course, I asked the dancers to discuss what they remembered from the course, using both general and specific examples. I was curious what they retained from the course, both as it related to the information presented, but also their experiences in the course. While the following passage integrates many voices into a single portrait, it also illustrates the diversity of the course members.

*Portrait: Reflecting on Introduction to Dance as an Art Form*

I have become much more aware of my body. The course was beneficial in preparing me for technique class, especially understanding how the structure of the body relates to technique. I remember constructive rest, breathing, and the image of the head as a balloon. There was also a day when we worked on head rolls coming from the thoracic spine and locating the sitz bones which gave me a different perspective for alignment in ballet. These concepts on alignment have allowed me to get into my body, and now I don't even have to think about it. After studying the scapulae, my arm movements have become more integrated and I know how movement from that part of the body should feel now.

Another aspect of the course was that technique didn't have to be the center of attention. And we had a choice – we could decide how big or small you wanted to move and how you can manipulate that. I learned about different relationships to music – on one hand it tells me how to move my body or I can pick one instrument and follow it. I began to think about my body in the same way. I also found that I could focus on my body this way in improvisation, and it kept me from being distracted. When we paused after moving in class, particularly when focused on moving with intention, I felt really warm and in touch with my body.

I remember we spent a lot of time discussing a concept Margaret presented as *inner and outer* – my interpretation of this was learning how to focus with your body: I have begun to focus on what is happening on the inside and not worry about what others think. After I learned to do this I felt more comfortable in the classes. Sometimes, “inner” is sensation or emotion – I do what I am feeling at the moment. However, I also want to let the environment touch me when moving, I am a person who likes to move in a large way – carving the space and completely withdrawing into myself. I minimize the contrast by bringing the outside in.

I remember the discussion of how the body can be used differently in the different types of dance – for me this means that I should relax more in ballet and modern, and yet I learned that African dance is all about the spine, and this helped me make the connection between the spine and sitz bones.

I had hoped that the dancers would incorporate the anatomic and somatic material within their bodies, integrating this information or knowledge with their dancing so completely that they would not have to consistently “think” about it. Knowing what to focus on from the overload of information presented was a challenge, as was learning how to apply the information both during the course, when the anatomic and somatic information was the focus, and also in dance technique classes and in performance.

#### *How the Information Changed the Dancers’ Dancing*

Although there was intrinsic value in the anatomic and sensory material, this information was not intended to be a means to an end, but to be applied within a context. Specifically, I hoped the dancers would make a connection with the other dancing they were involved with outside the courses used in the research. While my goal in all of the courses was to have each dancer process, embody, and integrate the anatomic and somatic material into their dancing, the follow up interviews revealed what information the dancers did take forward with them.

Some of the dancers made discoveries about tension in their bodies. Monique, a dancer in Introduction to Dance as an Art Form, described her feet functioning as a barometer for her. She said when she noticed tension in her feet, “I check in with the rest of my body – it usually goes ‘up’ from there” (Follow-up Interview, 02/20/2005).

Like Monique, Marta, also wrote about tension in connection to her experience in the Experiential Anatomy course. Marta sensed she was making progress in her ballet class because she had been discovering ways of moving that didn't create tension in her body. Throughout the course, Marta had learned to be more aware of the level of tension in her body and consciously reminded herself not to tighten or grip her muscles. When she saw a pattern of tension starting to develop in her body, Marta tried to "talk [her]self out of it slowly" (Follow-up Interview, 11/20/05). She had learned that using breath and working slowly or with momentum helped her minimize and control tension. While Marta had made a link to tension in her body while taking the course, she was still exploring this discovery six months later. In the follow-up interview she discussed still working on this as she described an experience with a guest teacher:

He wanted us to do a tilt and for some reason, I could do the tilt, but I couldn't hold it. He was telling us to hold it – and I looked at my leg and I saw I was starting to grip and I thought – "I can't hold my leg this way." So I had to situate my body so I could hold it and eventually I did, but I refused to let myself hold it by gripping extremely tightly. But I did notice after that my leg was shaking for a little while – I definitely think about that when I am in ballet – when we are doing an adagio I think, "Don't grip Marta, you can do it without gripping in your body." So that will be going through my head in a good way, not a bad way.  
(Follow-up Interview, 11/20/05)

Many of the dancers also continued to use imagery. While Miche accessed the anatomical information through imagery (Follow-up Interview, 10/23/05), Belinda discussed using imagery to find sensation, which helped her decide what she needed to do for her body. Belinda felt that visualization facilitated release in her body and commented on "how the body responded to imagery" (Follow-up Interview, 10/24/05).

Roberta discussed images that were actions for her, such as those that “feel like growing and shrinking.” In fact, Belinda had developed specific images of “rooting – having roots that grow into the ground that are strong but flexible – stable and mobile” (Follow-up Interview, 10/24/05).

In order for synthesis of the concepts presented in the courses to take place, the dancers would have needed to integrate the somatic information into their perceptions of themselves as dancers. For example, the information they had received about bone would need to be embraced as “my bone” or the processing of an experience would need to be interpreted by the individual dancers as “aware of my moving body.” The distinction between “the body” and “my body” in their writing and discussion was an important indication that they were embodying the information.

But synthesis was also seen in the dancers’ ability to evaluate a dancing situation and apply the information they had learned in the course as a possible solution. The dancers accessed their understanding of the body – and specifically their bodies – to acknowledge what they knew about their bodies, what they knew in their bodies, and what additional information they needed.

### *Somatics and Learning*

A common pedagogical approach for teaching dance is physical demonstration of the activity, augmented by verbal cueing. The dancers in the study referred to this practice as “patterning.” After a dancer has developed the motor skills necessary for performing specific movements using patterning, these actions are then refined in terms

of temporality and quality. This occurs even with very complex movement.<sup>32</sup> However, within a specifically developed dance form, does patterning movement allow dancers to think about their bodies while moving, or does the execution of complex codified movements preclude thinking in action?<sup>33</sup>

The participants in the study had many ways for describing how they learned movement prior to their experiences at TWU. Several of the dancers also discussed previously thinking about movement in terms of shape, vocabulary and form. For example, Miche, one of the participants from the 2005 Experiential Anatomy course, noted that in Ballet she associated movement with vocabulary; when she heard the term or name of a step, her body knew what to do. Miche described this as muscle memory (which meant she didn't have to think about it) and also as "a way of patterning" (Follow-up Interview, 10/23/05).

Molly, who was taking Ballet II at the same time she was enrolled in Experiential Anatomy, discussed how she needed to establish the pattern before applying the somatic information. Throughout the semester Molly noticed some progress in her barre work; in fact, she had gotten to the point where she could feel her rotation, but stated that she could "only get to sensation once I have the movement sequence" (Follow-up Interview, 10/24/05). In other words, Molly needed to master the steps before she could focus on what she was feeling in her body.

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<sup>32</sup> For more on activity and skill acquisition, see Magill (2001).

<sup>33</sup> For more on this see Simpson (1996) and Enghauser, R. (2003). In particular these authors argue that the somatic focus or focus on the body serves as interference for learning in a dance class.

Reflecting on her past dancing experiences, another dancer described how she learned to dance by distinguishing between the inside and outside of her body. When she first began dancing, she was taught to think about the shape, and this was an effective way for her to learn movement. Following participation in the course, she discovered that there is much more involved with movement than simply shape; she commented that now she is informed by sensation in dance class (Summary, Follow-up Interviews). Molly, Miche and their classmates were distinguishing between specific dance forms, or stages of learning, and what they were coming to understand as somatic.

The dancers in this study demonstrated that using language to describe their experiences was of secondary importance to the experience itself. However, if it is necessary for the dancers to express their awareness and understanding, perhaps they need additional vocabulary, one that encompasses both anatomic and somatic information within the context of performance—for performance is what the dancers are truly aspiring to.

### *Taking the Information Forward*

The older I get, the more I learn about the vast diversity of approaches and techniques to the work that are available ... the things you know about your body that are the parameters of your body are just challenges to movement invention. Find some way to do it, even if it's not exact to what was given. (Roberta, Journal Entry, Experiential Anatomy, 03/31/05).

The Experiential Anatomy course was a time for many of the students to explore and work on their bodies outside of technique. These dancers seemed to appreciate the freedom to explore things in their own bodies – the explorations gave them a sense of

agency, control, and confidence (Summary, Follow-up interviews). Many of the participants saw value in the knowledge they gained from the class explorations, applying the anatomic and somatic information to their dancing, their choreography and their teaching. Others discussed how the experience of processing the information ended at the conclusion of the course.

In the follow-up interviews, many of the participants noted that their objectives in thinking about their technique classes and about dancing in general had changed. One dancer commented that before taking *Experiential Anatomy*, she focused on looking nice in class: after taking the course she felt it was more beneficial to tune into her body. Another dancer who noted that while her body was not pretty for ballet technique this was no longer her objective in pursuing this training. A third dancer discussed how she processed the general comments made in class through her own body; this student felt she had developed a better understanding of how her body adapts to the forms she is studying because of this process (Summary, Follow-up Interviews).

A second benefit of the course was that it afforded the dancers an opportunity to think about how their bodies matched the demands of dance. Janelle found that understanding the structure and function of her body acquainted her with limitations as well as opportunity. She discussed “dealing with her structure” and wondered who should say what kind of body is right for dance. Janelle also expressed confusion about her body. She felt strongly about her grounded-ness, her ability to be on flat foot, and about her muscular strength, phrasing, timing and initiation even when she knew they did not match certain dance ideals (Follow-up Interview, 10/23/05).

While the focus of the courses was to help the dancers understand the structure and function of their bodies, this information must eventually interface with an individual's perception of their dancing potential. And while some were trying to "deal with their structure", many of the dancers found that the information about their bodies gave them a new way to think about their dancing.

### Making Connections

While the immediate emphasis of the somatic and anatomic information in the courses was linked to technique, in order to be valuable, the dancers would have to apply this knowledge in performance. And yet how does performance encompass anatomic information or somatic experience? Linking to performance was not explicitly discussed with the graduate students in Experiential Anatomy; however during the follow-up interviews the dancers focused less on thinking about their bodies and more on their ongoing dancing. However, at what point does information from inside the body interface with the outside in a way that erases boundaries (such as inside and outside) and weaves the somatic with the performative?

The students could conceptualize this erasure in other dancers, both in class performance as well as in more formal venues. In the Modern IV course the students made verbal affirmations when they saw that a classmate, or the teacher, was really "in their body." In Amye's opinion, somatically informed movement looks like it feels good to do. In Sarah Gamblin's movement, for example, Amye sees that Sarah is accessing information about her body. However, Amye was not sure she had yet achieved this in her own body.

Another dancer likened somatics to paying attention to her body, feeling that this attention would take her beyond just the shape of the movement. Yet another was questioning how to balance sensory information and performance. This dancer thought it was possible to receive information from both the inside of the body (sensory) and the outside (performance), but in order to apply this information, she knew it needed to be set up the right way (Summary, Follow-up Interviews).

Janelle discussed the link she made with being in her body and performance, describing performance as the result of a natural command of accents and intuition, a form of intelligence. When she focused on perfecting her movements, she felt sensations throughout her entire body; however, this only happened for Janelle while she was performing. Janelle also discussed attending to emotional components in performance. She focused on dynamic qualities because “without Effort qualities, movement was simply robotic” (Follow-up Interview, 10/24/05). Like other dancers in this study, Janelle was reflecting on understanding her body as a dancer, integrating her understanding of the anatomic and somatic concepts with aspects of performance and emotion; for her this involved tremendous complexity.

Like Janelle, Marta felt everything was beginning to come together for her because she had worked with so many somatic principles in the Experiential Anatomy course. For example, she had recently noticed she was using breath to initiate her movement and felt that working on somatic principles in class prepared her for performance (Follow-up Interviews, 11/18/05). The expanded view of performance and

dancing that both of these dancers were exploring did include the body, but for them, the body became a sensed, experienced reference, rather than a tool or an instrument.

### *A Specific Context for the Anatomic and Somatic Information*

Many of the students in the Experiential Anatomy courses also participated in the rond de jambe study, which was conducted early in the spring semesters in 2004 and 2005. Study participants performed grand rond de jambe en l'air at increasing heights while being videotaped, from six different locations in the room (See Appendix B).<sup>34</sup> In interviews conducted during the summer after the testing, the dancers first compared the videotapes of their performances in the testing environment to a three-dimensional computer generated model of the video data. The dancers then reflected on what they remembered feeling during the data collection and commented on what they were thinking while watching the presentation of the data. The experience offered yet another opportunity for the dancers to integrate or reflect on what they had learned in the Experiential Anatomy courses. Again in this portrait, many voices are woven together and presented as one.

### *Portrait of Rond de Jambe: Outside and Inside*

While watching the rond de jambe, I can clearly see that the movement in the legs affects the pelvis and movement in the pelvis affects the torso. And yet I am not certain what the pelvis *should* be doing. I was taught that there should be no tilt in the pelvis, but without tilting the pelvis, I am limited in my range of motion. How can someone keep the leg above 90° and not move the pelvis? And if I move my pelvis, is this “cheating?” I see the importance of standing correctly on one leg, but why

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<sup>34</sup> In 2004 the dancers performed the rond de jambes at 45 degrees and 90 degrees. In 2005, the dancers performed the movements at 90 degrees, 105 degrees and their fullest height. All of the testing took place in the Biomechanics Laboratory at Texas Woman's University.

is this different relative to aesthetic standards between ballet and modern dance. *Who should say* how much movement there should be in the pelvis?

I was aware of how difficult the transition from the side to the back was and how much the torso moved in relation to the rest of the body. I have discovered that my strength and flexibility change with the different height requirements of the leg and that (in fact!) the two sides of my body are different. I also know that I should maintain the natural curves in my spine during the movement, and yet, I saw a flattening in the lumbar curve when the leg went to the front. Is this healthy?

I need to change my sense that rond de jambe is an isolation because there are so many things happening simultaneously in the body that must be brought together. To perform a rond de jambe... brush and lengthen or reach, maintaining rotation and spatial awareness on both legs. Fill out the music or count with the movement and breathe as you find balance by ‘grounding’ through the foot. Even though I am reminded to use the whole body in performing the movement, I could feel myself gripping and concentrating on the gesture leg, particularly in the hip flexors as I lifted the leg to the front. I feel a stretch or a release in the hamstrings as the leg lifts to the front, but I find the imagery of the hamstrings “lifting the leg from underneath” confusing. This image facilitates a light quality, but I can see how this idea has created confusion for me.

In the end, dance should be about allowing movement, not restricting it. Perhaps it would be more beneficial to focus on the interaction between the pelvis and standing leg, perhaps described as a dynamic tension or opposition—reaching in two directions.

As this portrait illustrates, processing the detail and complexity of the information in this exercise would be overwhelming, and this is only one movement. Dancers cannot consciously attend to this much detail when they are dancing. Nevertheless, the depth and richness revealed in this portrait illustrates the many ways in which their bodies and their perspectives informed the dancers, and how this information differed by individual.

### *Confidence – What the Dancers Trust(ed)*

In general, the goal of training or rehearsing is for dancers to develop confidence and trust in the movement and its qualities. Even in the process of improvisation,

familiarity develops through the repetition and engagement over time. In the Experiential Anatomy courses, although we seldom repeated exercises or explorations in the courses after the initial presentation, recurrence of the concepts was consistent. Negotiating the anatomic and somatic elements of movement was the common element – this link may have developed or contributed to the dancers' confidence. And while the dancers developed this sense of confidence in different ways, at some point each found at least a point of application with information that she trusted.

At the beginning of the Experiential Anatomy courses, a few of the dancers discussed what types of information they trusted. One dancer commented that when she was confronted with conflicting information about her body or her training, she trusted the wisdom of her technique teachers. However, another dancer totally distrusted her teachers, stating that they didn't really understand her body (Summary, Follow-up Interviews). Yet throughout the courses, as a group of participants, the students had to learn to trust themselves.

Through the guided repetition, the students developed trust in the process, in their peers and in their selves. The courses used in the study offered the participants the time and support to develop these conditions. For example, Belinda had made the realization that developing awareness and knowledge about her body would help her develop confidence. Halfway through the semester she wrote:

Lately I have been using new self-talk to integrate anatomy [with] technique...this dialogue keeps me connected to my body [and my] awareness of my body in space. In doing this I have learned [about my] femur (legs) hanging and rotating from my acetabulum. I have been able to more easily access my abductors, adductors and rotators. I have 'been

alive' in movement, bright eyed and bushy tailed organism moving through space. (Journal Entry, Experiential Anatomy, 03/08/05)

Isabel had tremendous confidence in her body and found that the course information enriched this self-assurance, not only in her dancing, but in her teaching as well. As she wrote in this journal entry about channeling uncertainty into action:

I am still aware of how many reps to do and what kind of time I have to use for explaining the Pilates exercise – the transition times are when I am feeling something in my body. When there is nothing to feel in my body I think of something to do. My mind has not been relaxing; it is ready to take over at any time that my body sensors are not giving me knowledge ...it is the same in my dancing – I just move until I don't have any more body "thoughts"; then, I think of exercises and phrases to do in order to keep moving. (Journal Entry, Experiential Anatomy, 04/01/04)

Melanie, one of the students in the Introduction to Dance as an Art Form, discussed how confidence was related to her perception of how the movement looked or felt. Melanie had a feeling for what was right, however she needed to be careful not to tell herself that something was right when it wasn't. She felt that she still needed to affirm her sense of correctness from the outside. She also discussed knowing that if she could perform a movement correctly when she did it slowly, she knew it would be right when it was performed up to tempo. For Melanie, "confidence and lack of fear are important in knowing that I have the movement 'right'" (Mid-term interview 11/05/04).

During the follow-up interviews many of the dancers stated that while they had processed specific information while in the course, they had since stopped deliberately focusing on detail. Yet, many of these dancers felt more confident in general because they felt they knew more about their bodies. Marta, for example, noted that her movements were much clearer because she knew about initiation and intention. "This

has given me much more clarity when I am dancing ... and I have a lot more fluidity in my movements” (Follow-up Interview, 11/18/05).

Finally, during the follow-up interviews, many of the dancers vividly described the experience of being in the course. Additionally they talked about feeling more confident with their overall performance in the TWU dance program compared to the previous semester or year. For some, this meant they felt more secure in the department – one dancer in particular noted being more accepting of her skills and unique attributes (Summary, Follow-up Interviews).

Once the dancers developed confidence with the material, they began trying to apply the experiences they had gained in the courses. Although learning to trust their “felt” experience while meeting performance expectations was important, the dancers also valued maintaining health and balance in their bodies. As one dancer explained, she wanted to do well in dance, but she did not want to get hurt. Another dancer was striving for physical symmetry balance in her body. She knew she favored her upper body; therefore processing internal information that related to torso and arm movement was successful for her. She realized she needed to focus equally on accessing internal information with her lower body, even though this was harder for her (Summary, Follow-up Interviews). Melanie was seeking equilibrium with the material and concepts presented in class. She stated that while she could reference the somatic material she wondered how she could “develop a feeling for it being right.” Melanie felt that she needed more time to understand how her body was feeling doing these movements (Mid-

Term Interview, 11/05/04). For many of the dancers in the courses, time seemed to be a crucial element for integrating the information with their dancing.

The anatomic and somatic information presented in the courses provided a foundation, but confidence requires additional elements for development. The students integrated the material presented in the course in various ways. Specifically there was assimilation in the technique class that reinforced the anatomic and somatic information (such as Modern IV or Ballet II). In addition, the department emphasis on providing opportunities and encouragement to think about and discuss the body in the courses complemented these factors. Each of these elements contributed to the increased confidence that the dancers in this study experienced.

#### What (and how) the Dancers Know

This section explores two aspects of the research: 1) the difficulty of retaining the experiential knowledge without practice and 2) how much the dancers should attend to their bodies when dancing. Because the courses in this study offered a time for the students to investigate and reflect on their bodies, as well as their previous and current dance training and possible points of interface between the two, the dancers' discoveries were complex amalgamations of what they were learning about their bodies, about themselves as dancers and about the interface between the two.

For example, while she was taking the Experiential Anatomy course, Miche had worried about forgetting the experiential knowledge she was gaining. In fact, during the follow up interview she commented that it took deliberate thought to reconnect with what she knew and had learned in the course. Miche stated,

Life gets too full of other thoughts and pending activities that this awareness gets pushed aside and we in a sense forget what we know, until we reflect and then we think, “oh yeah, I knew that”, or “oh yeah, I remember how that connection feels.” (Follow-up Interview, 10/23/05)

And after spring break, Bridget, a student in the 2005 Experiential Anatomy course, wrote, “Being out of Experiential Anatomy [class] for two weeks already makes me feel a bit mis-guided in my independent self-analysis” (Journal Entry, Experiential Anatomy, 03/25/05).

At the same time, many of the dancers were trying to determine how much they should attend to their bodies. While some of the dancers mentioned that thinking explicitly about their bodies got in the way of dancing, many saw that understanding how their bodies created movement would enable them to develop control or clarity in their movements. As Roberta mused:

Oftentimes when I’m thinking about the work that we are doing, I will mentally reference a kinesthetic experience I had in order to immediately relate the information... I am curious however, about what we take into our bodies and how that effects us in life. I know I cannot prove that I process information solely through my body first and foremost, but I do know that it happens more often than not. (Journal Entry, Experiential Anatomy, 04/07/05)

And Janelle, in a long but very evocative excerpt from her journal wrote:

I am thinking about the affect of the mind on the body. I am completely enthralled by the idea of promoting physical healing through imagery, as Juhan noted as successful in the text. I think that it says that we have much more power over our biology than we might be aware of. I am excited to see what benefits may result from positive thinking. It speaks to mind-body connectivity’s integral role in our living and moving, and demonstrates the truth of the soma... the soma exists—and our “muscle memory” connects to the brain. The faulty memories of my “incorrect” movements have embedded so deep into my muscles that they are also in my brain. I couldn’t even see the memories at first, but could sense them

and my brain was aware of my muscles' programming (even when I was pretending – or activating that part of my brain that commands to move). [C]atching myself doing something wrong – even when I wasn't doing anything or even consciously thinking of it – is in some way proof that thinking has the power over doing. (Journal Entry, Experiential Anatomy, 03/31/05)

These quotes from two participants in the 2005 Experiential Anatomy course illustrate contrasting perspectives: Roberta trusted the layering of information she got from her body, and Janelle was surprised when her thinking lagged behind her sensing. Are these different ways of processing information about the body, or simply different explanations? When I observed these two women in class, Roberta was always moving, always processing what she was hearing through her body. In contrast, Janelle was still. That does not mean she wasn't experiencing as much sensation as Roberta, but that these two women processed the information and the experiences differently.

Indeed, each individual in the courses, and in the study, had her own way of understanding and integrating the experiences and information into her dancing. And as the dancers processed the anatomic and somatic information, many of them noticed effects on their bodies. Thus, the dancers were presented with a challenge – to reconcile the anatomic information with what they were processing somatically.

As Melanie, one of the dancers in Ballet II and Introduction to Dance as an Art Form, changed her alignment, she wondered if other things would begin to change in her body as a result. Her adjustment to a more neutral alignment had prompted her to ask, “What is right for my body and what is right when I am moving?” (Mid-Term Interview 11/05/04) In contrast, early in the semester, Roberta was focused on the effect that her

scoliosis had on her alignment. She devoted a great deal of time and effort to analyzing and moderating the effects of this deviation in alignment. However, by mid-term she wrote, “The one thing I’ve really been learning is the beautiful curve of the spine and while it can be efficiently aligned, it is not a straight line” (Journal Entry, Experiential Anatomy, 03/04/05). Roberta’s scoliosis remained the same, but her perception had changed.

Certainly the dancers learned to use the anatomical information to their advantage. I did not witness any unrealistic evaluation or description from the dancers; in fact, just the opposite occurred. Most of the dancers clearly understood the physical demands dance placed upon their bodies, and they were learning how their anatomical structure facilitated or inhibited their successes with movement. This created a context for the dancers to evaluate what might otherwise be perceived as “weaknesses and strengths,” for example, not having enough rotation at the hips or enough hamstring flexibility. And while the dancers struggled to accept things in their bodies, which they perceived as limitations, at the same time they became realistic about their physical potential.

#### *Negative and Positive Aspects of Thinking About the Body*

In order to internalize the anatomic and somatic information, the dancers had to think about their bodies. This was seen in learning the names of muscles, locating bony landmarks, and then incorporating the anatomical information in relation to particular movements. The somatic work asked the dancers to process sensation from their bodies

and reflect upon this information. This processing of multiple sources of information required a great deal of focus and concentration.

For some of the dancers, the attention to the body was problematic. Gayanne commented that thinking about the body interfered with her ability to learn in dance class. She felt she needed to pay attention and learn the combinations and then work on sensation:

It's as if I put too much in my brain at once while learning a new sequence. I guess I am so used to steps being "broken down" that when it's taught without broken down (tiny steps), I lose my connection with the movement because my thoughts and questions are circling in my head while learning. Do I focus on the actual steps and then worry about getting it into my body or do I try to do both at once?" (Journal Entry, Experiential Anatomy, 04/20/05)

Like Gayanne, other dancers noted difficulty when applying or transferring the sensory information to dance technique class. Thus, for some of the participants, thinking about the body was problematic.

Not all of the dancers saw the focus on the body as negative, however. Reflecting on her experiences after the 2004 Experiential Anatomy course, one dancer saw the anatomical information as empowering and felt its mastery enabled her to understand her body. Another dancer noted that she could use the information from the course to change her body and eliminate pain. One of the dancers felt that the information allowed her to choose how and where to focus her attention while another felt that the anatomical information helped her develop images. Finally, one of the dancers stated that repetition led to embodiment, which in turn decreased the amount of thinking required (Summary, Follow-up Interviews).

For some of the dancers, the negative and positive experiences were rolled together. As Molly wrote, “Its official ... I am obsessed with the position of my shoulders/scapulae” (Journal Entry, Experiential Anatomy, 04/01/05). But at the end of the journal entry she also made a connection between focus on the scapulae and thinking about her own “back space.” And Bridget wrote:

Being in my body is perhaps a bit confusing. Sometimes I feel I know exactly where I am and how to analyze what I am doing, but other times I am unsure if I have really found a problem or just created one. (Journal Entry, Experiential Anatomy, 03/10/05)

In the follow up interviews, several of the dancers commented that after the course ended, they tried to stop thinking about their bodies. Toni, for example, noted that she felt consciously thinking about her body, inhibited her dancing. Denise, a participant in the rond de jambe study, echoed this comment. However, do these comments problematize the issue of thinking about the body?

In summary, the effect of thinking about the body provided ambiguous data. Is attention to the body productive in short term time frames? And will the students retain the information they learned in the courses through time? In the end, this research will need to address to what extent focusing on the body was useful for the dancers or whether it became counterproductive.

### What the Dancers Learned

All of the students who participated in the courses experienced some changes in their perceptions about their bodies. The dancers’ journal entries provided evidence of these shifts in perception, identifiable through the dancers’ specific use of the anatomic

and somatic language, as well as their discussion regarding application of the concepts in other classes throughout the semester. Some of these changes were more profound than others.

Molly, one of the students from the 2005 Experiential Anatomy course, underwent a deep transformation, both as a dancer and as an “experiential anatomist.” Although the Experiential Anatomy students were expected to write one journal entry per week, reflecting on the class they had just participated in, Molly wrote everyday. At the beginning of the semester, her journal was full of questions - mostly items for clarification—and most of them had to deal with perceptions that her body was not suited for ballet and some forms of modern dance. However, as she continued writing (and dancing), Molly began to express herself with a more articulate and reflective voice. This change in voice showed that her perspective on the body, and particularly her body, was beginning to change. Early in the semester Molly wrote:

A major concern I have is the position of my head. I sense that it is often in a downward tilt after my experiences with this exercise. If I am already out of alignment at the top, I assume this sets a negative precedent for the rest of my body. (01/27/05)

Later in the semester, after working with a partner on the positioning of the head, she commented:

It felt like my neck/head stayed in place and my shoulders were sliding down my spinal column. Once we were given the directive to imagine our partner’s hands on our heads, I began to feel more connected, like a complete unit. My head did not feel wobbly, but well supported....I felt complete, aligned and relaxed. (04/08/05)

Even later, after considering theories about how people learn, Molly wrote:

I am very detail oriented so it has taken me awhile to adjust to just diving in and attempting a movement about which I am not terribly knowledgeable. My tendency is to ask every possible question before I even begin to move. It may be that this desire for knowledge actually prevents me from moving. If I waited to move until I knew everything, I would never move. (04/22/05)

The reflections included here illustrate changes in Molly's perception of her body and her ideas about moving and learning, and yet are also illustrative of the changes in perception many of the other dancers were also making about their bodies.

A final piece of the data came from the body stories the students in the 2005 Experiential Anatomy and Introduction to Dance as an Art Form classes wrote. This assignment, based on an activity from Andrea Olson's book, asked each student to write a personal narrative that included description of a bodily experience. Some of the dancers wrote caricature stories, others expanded on their journaling process. However, each narrative described the discoveries the individual dancers were making. Two excerpts are included here. Belinda wrote, "I feel like I know how to listen to my bodily needs and attend to it" (Body Story, 04/26/05). And from Marta's journal:

Somatic knowledge has truly improved my dance performance because of the internal images that provoke connections of concepts to my approach to movement. It would be a pity to throw such a precious gift away because of someone else's ideas of what particular dance positions should look like. My joints are integral parts of my body configuration and trusting anyone but me with it is a risky choice. From this day forward I embrace my body's uniqueness... (Body Story, 04/28/05)

Each story was unique to the individual, and each dancer went through some process of evaluating and rethinking their relationship to their body. In summarizing what they had learned about their bodies, these personal narratives served as a document and testament

to what the dancers had learned in the semester; it brought the semester's work into perspective.

### Knowing in the Body

Entering into the research I wondered if working with the anatomic and somatic information—literally taking this information into the body—would take shape as knowledge within the students' dancing. Therefore, in direct and indirect ways, I asked the dancers if using anatomic terminology and accessing sensation would allow them to articulate how they were moving and how they were feeling more completely. I addressed this as a query, "What does it mean to know in the body?"

I asked the dancers this question on more than one occasion. For some of the students, the answer evolved over time; for others it stayed exactly the same. In the Introduction to Dance as an Art Form course, the answers varied and many evolved throughout the semester. Most of these dancers were just scratching the surface of their "felt" experiences. As these dancers were only beginning to access information about their bodies they may not have been ready to put words to their experiences. Some of the dancers, lacking the confidence that they were correct, seemed to answer the question in a way that they hoped would be helpful to the research.

In fact, most of the dancers struggled with this question. Melanie, an undergraduate dancer in Introduction to Dance as an Art Form and Ballet II knew that knowing in the body had something to do with sensation, that this knowing was "deeply rooted and kinesthetic" and that it should indicate being more comfortable with movement, but she had difficulty describing this physical knowledge. For Melanie, the

language of the body was different than verbal language; thus using verbal language to describe the physical sensations she was experiencing was a limitation for her (Follow-up interview, 04/05/05). Janelle, a graduate student, countered my inquiry with questions about *how* we know *what* we know; she wondered if it is important to know *that* we know. Janelle asked, “Do advanced level dancer’s perceptions line up with what they do – can they articulate this?” (Follow-up interview, 10/23/05) Based on these responses, “knowing in the body” appears to be a complex amalgamation of intellectual and sensory information, which manifests differently for each individual.

In the portrait that follows, answers from the students from the Experiential Anatomy courses and Introduction to Dance as an Art Form are woven together to reveal the complexity and depth of the dancers’ experiences, forays into *felt* perception or knowing in the body.

*Portrait: Knowing in the Body*

Knowing in the body – is everything – knowing what a body can do – feel... once I know the right way of doing the movement. Knowing in the body is when we automatically do something. It has to do with breath – a sensation of lifting and falling on the inhale and exhale. It is something you feel, recognize, acknowledge – reflect on purpose and function; it was about being aware.

Knowing in the body is when you can do something more than once, when one can rely on the body. It could also be described as a somatic engagement with the body. Development of knowing in the body requires a foundation, it is about instinct; an embodiment that develops through training and repetition. Knowing in the body is when you can feel, sense, see ... they all come together. Knowing in the body is confidence and is linked to performance; it is when the dancer compares internal sensations to external. Knowing in the body is an automatic response which doesn’t require thought, but allows a dancer to find relaxation. It is an attentiveness or problem solving, being open to new

information, finding out what works in one's own body. It is trust; it is muscle memory.

Knowing in the body is informed by imagery; it is a feeling in conjunction with awareness, it is a personal quality of attachment. My body is more knowledgeable about my self than I (my mind) am. It means you do not have to think about the technical aspects and awareness of what that technical aspect feels like in your body. You know you have the material, not because you looked in the mirror, but because it felt right.

Because the application of knowing in the body has changed these students' dancing, they now can appreciate how movement and performance are applications of the anatomic and somatic information; performance and movement made the course information meaningful for them.

### Summary

As the above sections have shown, most of the participants in the study gained appreciation for the anatomic and somatic information as they began to understand the uniqueness of their bodies, and knowing when they could access and utilize the concepts and sensations. When the students could link the information from the course directly to technical styles they were studying, the experience of being in the course or a specific class was beneficial for them. Some students recognized direct relevance of the anatomic or somatic concepts to their dancing; others may have only identified specific ideas they needed to work on.

Reflecting on their participation in the course it was clear that the material they retained went through a transition. Perhaps the dancers only remembered bits and pieces of information, but all made some connection with the material: they became more aware of their bodies, they saw how the information traveled through time, and they could see

how all of their experiences in the class linked to performance. In addition, the dancers developed skills for integrating the concepts and ideas they had about the information in their dancing; they developed an ability to define a problem and search for a solution and found meaning for their experiences in many different intersections.

The next chapter discusses the pedagogical component of the dancers' experiences. The chapter also explores how this approach of teaching about the body—asking students to focus on the experience of being in their bodies—both shaped the research, and influenced the pedagogy of those teaching the courses. Certainly Sarah and I, as instructors in the courses used in this research, were informed by this experiential knowledge, but as is revealed in the next chapter, the students from the courses were also accessing this information when they become teachers themselves.

## CHAPTER VI

### FROM MY BODY TO YOURS:

#### PEDAGOGICAL REFLECTIONS AND APPLICATIONS

I always hoped that the anatomical language that the dancers were learning and working with would give them the means by which to articulate changes in feeling or perception they were experiencing. And yet as I look back on the course, particularly witnessing Sarah taking the students through an exploration, it was not the words she used that told me she was very much in tune with her body, but the inflection and the way in which she said things that served as evidence. (Researcher Journal, 09/04/05)

In this chapter I will address the interface of pedagogy and research. I will discuss how the pedagogy was shaped to help the dancers learn about their bodies, how the goals for teaching and research were complementary and symbiotic and how information and communication was a key element in the pedagogy. I will illustrate how the dancers integrated their experiences from the courses as they began teaching on their own. I summarize the experiences and discoveries of two dancers through time, noting what I learned from them as well as my colleague, Sarah Gamblin. The chapter concludes with personal reflections on learning and teaching and looks at how the courses and information both changed over time and were transported into the future in my teaching at the University of Wyoming.

#### Pedagogical Approach

I entered into the research with a clear idea about what I wanted to accomplish in the individual courses. I had a desire for the students to know more about their bodies,

and for them to use this information in their dancing. I expected they would need to process the information *in* their bodies and then incorporate the information with their dancing (for this was the process that I went through). I also knew the structure of the courses had to be open and flexible for optimum benefit from the information and the experiences for each dancer. And while the weekly classes were built around a structured syllabus in each course, often the content of the individual lesson was reshaped to incorporate the dancers' questions and concerns. This fluidity of the information relative to the dancers' needs was an important aspect of the pedagogy.

I have taught dance technique from a body-centered perspective for the past 20 years and I have conducted substantial research and personal investigation about the body and how it operates in movement. And yet, how does one teach about the practice of experiencing the body? One doesn't. As instructors for the various courses Sarah and I simply created an environment in which the dancers felt supported and confident as they explored the information about their bodies, through their bodies. We used anatomical information as a framework, but much of the material in class was experienced somatically. Both Sarah and I have studied a variety of somatic disciplines, but rather than focus on one somatic practice, we incorporated our experiences with these forms in our teaching.<sup>35</sup> Therefore, in the courses used in this study, rather than focusing only on information from anatomy or somatic disciplines, we established a means whereby the

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<sup>35</sup> Sarah has studied Klein Technique extensively, while my work in somatics has been broad, rather than focused on one technique. I have studied Bartenieff Fundamentals and Effort/Shape with Mary Williford Shade, Peggy Hackney and Bill Evans; Ideokinesis and dance-specific proprioceptive neuromuscular facilitation sequences with Irene Dowd, and work with reflexes and righting patterns in Body Mind Centering.

students could learn about their bodies—in their bodies— as the primary objective for both the individual courses as well as the research.

For the Experiential Anatomy courses, Sarah and I met every Thursday morning to identify key components of the topic for the week and develop a list of “things” to do within the class. We spent about five minutes discussing details; the rest of the time was spent discussing the week’s topic on a more philosophical level. During these discussions we would go into much more depth about the body part we were focusing on than we would be able to during the class. Speaking in personal, pedagogical and artistic language, the discussions were heavily anchored in cultural aesthetics and philosophy.

As I wrote in my journal,

I feel that if the students in the class could observe the planning meeting, the entire context for the course would be obviously clear. They would learn a lot about how we reason through the material; they might understand more clearly what has not been included, and they would get a stronger sense of our philosophy, one that we both embody but at times must keep to the periphery when we are meeting with the class on Fridays. (Researcher Journal, 04/05/05)

Certainly the philosophical attitudes Sarah and I have about movement, dance styles, and performance have shaped who we are as individuals, but we tried not to make these ideas explicit in our teaching. We knew we were working with groups of individuals, each of whom needed to make her own discoveries, and develop her own philosophies, as Sarah and I had at one time.

### *Pedagogical Strategies*

Like the anatomic information, the somatic work explored in the classes was not intended to be a means to an end, but offered a way for the dancers to access information

from their bodies. In the Introduction to Dance as an Art Form course, the information was presented to the first-year undergraduate students in the context of movement to prevent the dancers from feeling self-conscious in their explorations. During the Experiential Anatomy courses we pulled full-length curtains across the mirrors or turned the activities away from the “front” of the studio during the classes so these graduate level students could focus on their physical sensations without visual affirmation. Whenever possible, we completed explorations on the floor.<sup>36</sup> For example, on the day the scapula was the topic, the dancers first worked with partners; one partner located, traced and then mobilized the scapula while the other partner was lying down. Next, while lying supine, each dancer worked on their own, initiating movement from different parts of her arm to feel how their scapula moved in response to this. Finally, the dancers stood and performed figure-eight arm swings attending to the movement of the scapula – sensing its weight and its rhythm.

I used a similar approach in Ballet II, a class that is typically very structured. I introduced a concept at the beginning of each week and wove the pertinent details and different ways of experiencing that information through the subsequent classes. For example, I asked the students to begin the class with spiraling movements while sitting and standing. The dancers explored this three-dimensional movement in their bodies during a short improvisation and then applied this new sensation to *tendu quatrième*

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<sup>36</sup> In many instances, somatic exploration as is experienced in Bartenieff Fundamentals and other practices is primarily done on the floor. This is a good orientation to minimize gravity’s effect and allows the dancers to eliminate distraction from focus on their bodies.

devant. For some of these ballet dancers it was refreshing to bring the languages and concepts they had explored in other classes (especially modern dance, but also their work in Bartenieff Fundamentals) to their work in the ballet course.<sup>37</sup>

A second pedagogical strategy in the ballet course was to ask the dancers to reference actions they were familiar with using a different perspective. For example, when performing grand battement I asked Brendan to attend to the quality and feeling of the brush, rather than the height she was aiming for with her foot. Brendan reflected on this change in her journal,

I noticed a huge difference in the action of the pelvis. When I did it the first time I was thinking more about height and this was causing unnecessary action in the pelvis. The second time I thought more about brushing and lengthening the leg, as opposed to height, and actually had less movement in the pelvis, along with more lift and height. (Journal Entry, Ballet II, 02/01/05)

Brendan's classmates also witnessed the change in her performance of grand battement. They commented that she was performing the movement with her whole body, and that there was more presence and weight in her movement. By focusing on sensation inside of her body, rather than trying to meet an external goal, there was a new awareness for Brendan, which was similarly revealed to her classmates in the performance.

To further stimulate the students' active involvement with their learning and knowing, I started one class with a ballet barre that began with tendus and ended with plié. While most of the exercises at the barre incorporated demi plié, I delayed the plié

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<sup>37</sup> It is also worth noting as the semester progressed and the students in this course developed a deeper awareness of their bodies' abilities to negotiate the demands of this movement style, many of them developed a new appreciation for ballet and began thinking of themselves as ballet dancers. Furthermore, they could see how information from this class could be useful to them as modern dancers (Summary Mid-term Interviews).

combination until the very end. Although sequencing the class this way might be questionable in the eyes of many ballet teachers, as the following portrait illustrates, both positive and negative reactions were elicited to this change in exercise order. The portrait merges multiple voices and opinions.

*Portrait: Doing Plié Last*

It did feel a little awkward to start with because I didn't feel that openness in my thighs or the stretch of my legs. And when we actually did do pliés my body felt such relief. It was really weird, I did not feel like my rotation was as warmed up; I needed more of a stretch. I disliked not doing pliés first because I felt incomplete. Pliés help me stretch and get into the mood of ballet. I like doing pliés at the beginning of class because it warms up my ankles

Doing pliés last left me feeling more energized than doing it first. Tendu is more exciting to me, so it is easy to get into that at the beginning of class. I liked the pliés coming last. I felt that my body was warm and that I got a better stretch from the pliés. My knees did not hurt this time when I did the grand pliés. Not doing plié was a nice change – got fired up for class – I liked the effect of doing plié last – it was a stretch after doing all of the other work.

I felt fine until we did the pliés instead of an adagio, and then the pliés felt all wrong. I liked the variety, and would like to do it again sometime. I did not recognize any affects on my body, just on my mind. Since my body was already warm coming into class it made the pliés more effective than if I had done then at the beginning of the barre.

Prior to this experience, the dancers may or may not have been able to articulate why plié is the first exercise done at the barre. Surely previous teachers had explained why they do plié, yet after participating in this experiment, for better or worse, they understood it in their bodies. Although I may not likely repeat this experiment in the same way – it created discomfort for the dancers and me—it was valuable to know that the dancers could feel the difference. (I admit that on that day *I* experienced calf cramps later on during the barre that I had never experienced before, but I am confident that I

was the one who suffered most from this “research.”) Nevertheless, I would consider both starting and ending the barre with plié.

The dancers made valuable discoveries by experiencing something different in the class and observing the effect this change had on their bodies. It is my hope that they take forward some of the ideas and feel confident to integrate what they know from other classes and dancing experiences in their future study of ballet, and send forward these experiences to their dancing careers in general.

#### *Addressing the Density of the Information through Exploration and Application*

The dancers were experiencing many types of information in the courses: anatomic detail and vocabulary, imagery, visual and verbal feedback, sensations and feelings – to name only a few. Without fail, there was more information presented in the class than the dancers could possibly integrate. However, this was not new to the dancers; dancers have learned how to selectively process information about the body or intricacies of the movement. If they didn't do this, they would not be able to dance freely and fluidly. Yet, how were they experiencing this information? What sensation or feeling gave them clarification? Did the dancers identify this as knowledge?

During the courses in the study I observed several students experiencing the information they were hearing and observing *in* their bodies. In a few instances, it seemed the dancers were trying to process everything all at once, particularly during the Experiential Anatomy courses. Sometimes this manifested itself as a retreat into their bodies while moving – focusing internally rather than externally, yet at other times the dancers also confirmed what they were feeling by looking in the mirror. There was a

physical presence of these experiences – dancers moving or moving body parts as they listened to the conversation or directions. This bodily processing was the mode of presentation demonstrated by Sarah and I, and we encouraged and acknowledged these physical explorations in the students.

For some students, the information presented in the courses was reinforced in other classes. During the Spring 2005 semester, four of the students were simultaneously taking Modern IV from Sarah, where the anatomic and somatic information was revisited within the technique class, and one of the dancers was taking Ballet II where there was a somatic approach to teaching this technique. Amye wrote, “It has been very beneficial to have the same professor for Experiential Anatomy and Modern technique class because she will often use the concept we discussed in Experiential Anatomy as a focus for class” (Journal Entry, Experiential Anatomy 03/04/05). And Belinda noted, “I think having Anatomy and Modern from the same teacher is really helping me maintain connections and apply; experiment. I like being allowed to ‘go there’” (Journal Entry, Experiential Anatomy, 01/28/05). The dancers were making connections with other courses as well. For example, responding to her experience in the Experiential Anatomy course and the rond de jambe study Miche wrote, “I used some of the information in ballet class...the Y ligament, rotation and pelvic tilt – I felt more aware and in touch with my core and skeletal configuration in motion” (Journal Entry, Experiential Anatomy, 01/30/04).

As stated earlier, neither Sarah nor I wanted the courses to be a means to an end. The true application of the ideas and experiences, planted and nurtured in the individual courses in the research, came in the integration with other courses the dancers were

taking or their dancing. Yet other evidence for application was observed in the individual dancers' description of their experiences.

### *Writing Poetry*

Whereas the dancers wrote about discoveries or connections they were making in their journals during the classes, I often would ask them to illustrate an idea or simply make an outline of their thoughts. However, one day during the 2004 Experiential Anatomy course I asked the students to write a poem. While this was a spontaneous idea and experiment, I discovered that using poetry was a useful strategy for getting the dancers to link to a language of sensation in their writing.

On the day we were discussing breath there was a great deal of emotional tension in the class. It was also close to mid-term, usually a stressful time in the semester for students, and they naturally brought this negatively charged energy to class with them. Realizing that the dancers needed to process their anxiety—emotionally and intellectually—I asked them to write their thoughts about breath in poetry. I hoped this abstract form of writing would allow them to express their feelings' complexity instead of focusing only on one or two details. Those who needed detail, incorporated it, those who needed the writing to be transformative were open and abstract in their creations. In the two examples that follow, the complexity of breath and breathing is revealed, but also, the poets' relationship to breathing and to her sense of self can be seen:

For me, breathing is...  
Subconscious  
Frustrating by the hundreds<sup>38</sup>

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<sup>38</sup> This refers to a specific exercise from Pilates Exercises.

A given  
Restricting upon awareness  
Essential  
Challenging to harness  
Easy  
Uncomfortable to let go  
(Miche, Journal Entry, 02/20/04)

And another:

“For me, breathing is... something I do all the time – small; small breath. Do I breathe big enough of the time? I ♥ to breathe deeply and big – it takes time & it gives time. Sometimes I do not want to breathe... I want to be busy, tight, stress-holder woman. Other times I laugh out loud and take deep breaths and find my flexible, mobile, open-chest to the world self. (Isabel, Journal Entry, 02/20/04)

The poems were delightful to read, but appeared to serve an important function for the students as well. By transforming the documentation of the concept or activity, the dancers could re-define their relationship to the activity, in this case, the exploration of breath, in the poems. The dancers were able to reveal what they were processing and feeling more playfully, more evocatively and less self-consciously than in the journal entries.

I assigned poems in the Introduction to Dance as an Art Form course, again to discuss breath, but also in Ballet II, to query their understanding of plié. In ballet class, plié is the first exercise performed at the barre. Plié is also a transition for most every movement in class; it provides fluidity, suppleness, and strength in the legs. Yet, I believe dancers do not often think about plié in this perspective. I have already discussed how the students responded to a change in ballet barre where the plié exercise was placed in a different order, but here I present a portrait – a summary of the poetic musings from the dancers in Ballet II.

*Portrait: Plié*

Plié, the transition between all movement – yielding, bending... getting lower to the ground with the pelvis by loosening the invisible rubber band that goes from my sitz bones to my heels... snap, crackle, pop, the sound of my knees when I bend, down to go up – I bend slowly like a rubber band being pulled in two directions. Knees begin to bend like I am melting into the floor, a diamond is formed with the legs bent ... Each plié is a inch away from death, and a mile to eternity... plié has refreshed my limbs and lengthened my legs...it supplies you with power, and soon you will never cower to a triple pirouette on pointe. Your jumps will be higher, your ass will be finer, when you discover the magic of plié you'll jump up and shout "hooray".

And, one dancer's poem, in its entirety,

Plié (is and feels like)

Bend and stretch, feet flat flexed.  
Pole at center of the body, booty sticking out is naughty.  
Knees over toes, spread out those toes. Heels up in grand—  
    lower while legs lengthen. Second wide feet flat,  
    heels down feet catch,  
    Weight even, core strengthen, loosen stretch,  
    Thighs, joints, Achilles, calves feel best.  
Floating down, not touching the ground,  
    Rising high pressing feet down.  
Lengthen, strengthen, elongate, widen  
Pressing through clouds in the sky while feet planted like roots,  
    Imagine going high, high  
This, ascending from a plié feels like.  
    (Cory, Ballet II, Journal Entry, 01/29/05)

Although one may question the literary merit of these poems, these short works—visual as much as they are verbal—are sensory and evocative. Expressed through a language of sensation more than description or analysis, these texts provide great insight into what the dancers were feeling. Perhaps the dancers felt freer to access and incorporate both sensation and emotion in these assignments; perhaps this form seemed

more open to them than the typical journal entry. Regardless, the dancers' words expanded their perception of what the action and sensation of plié is. Naming their experiences also became a means for identifying and processing their bodily feelings.

### Research as an Opportunity for Learning

The rond de jambe study provided an application for the dancers to perform a dance movement that could be measured quantitatively by comparing the dancers' leg height to a measured standard—an external measure. While the testing environment was clinical, it still supported the dancers' efforts to process sensory (and emotional) information from their bodies. This was due, in part, to the questions the dancers were asked before and after the testing; the qualitative information was purposefully interjected prior to the testing experience. The questionnaires that the dancers completed are contained in Appendix C. In addition, the dancers were asked to think of performing the rond de jambe with their whole body, so that the movement was not limited to actions of the pelvis and legs. In this same environment, a certified Laban Movement Analyst qualitatively described the dancer's movement patterns. This person documented the Effort qualities and Body Connectivity patterns the dancers were using, including their use of breath and spatial orientation as well as the "Effort Life"<sup>39</sup> patterns they were experiencing in the testing.

The testing environment provided a performance opportunity for the dancers in a very unique setting. Several of the dancers had participated in previous versions of the

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<sup>39</sup> Effort is the dynamic quality of movement, described by Laban Movement Analysis. Hackney (2000) writes that "Effort reflects the mover's attitude toward investing energy in four basic factors: Flow, Weight, Time and Space. For more on this see Hackney (2000) p. 219 -221.

test and were familiar with the set up. However, even for those participating for the first time, in general, the dancers seemed confident in the testing environment.

Four months after the study, I met with the dancers to watch the video of their test. Watching the videos, the dancers could see their performance of the movement as a whole, an opportunity that few of the dancers had enjoyed previously. The dancers noticed a great deal of detail, including the movement of the upper body and change of position in the legs (bent, hyper-extended, etc.); seeing the weight shift from two legs to one, and then back to two; how the pelvis opened with the leg and how the body shifted as the gesturing leg moved.<sup>40</sup> As the dancers watched the video of their tests many were surprised at the height of their gesturing leg; it seemed that the dancers didn't correlate their memory of the leg position with what they saw in the video. Therefore, observing the video provided the dancers with an outsider look at their performance of grand rond de jambe from which they could reflect on their performance of this movement.

After watching their videos, the dancers looked at a three-dimensional computer generated model, a composite created from all six camera views. All of the dancers immediately observed the amount of movement in the pelvis and the spine. They noted that as soon as the leg moved toward the high front position (devant) the pelvis tilted backward. Moving from watching to description, some used imagery to depict the pelvis movement, for example, representing the pelvis as fluid. Others stood up and tried to physically experience how much, and in which direction, the pelvis was moving. One

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<sup>40</sup> The dancers knew that the gesturing leg was supposed to stay turned out, and they knew that the raising of the leg affected the pelvis, however several dancers asked about the effect that resisting the tilt in their pelvis would have on the rest of their bodies.

dancer noted that the side view related more closely to what she saw in the mirror when taking class (Summary, Summer Interviews). While the quantitative data revealed to the dancers that there was more pelvis motion in the performance of the grand rond de jambe than they had assumed,<sup>41</sup> what is important in this section is the match or mis-match of their recollection of, or re-creation of, the sensation of performing when compared to what they observed in the models.

When I asked the dancers if they thought the model was based on the video taken of them, the dancers identified several points to indicate that the model was representative of their performance of the rond de jambe. They could observe their individual movement patterns and habits, such as hyperextension of the legs or spine. In fact, one dancer felt that the model told too much of the truth – it showed how the body really functioned and how the model didn't conceal the dancer's (perceived lack of) training. Several dancers felt that this view, an abstraction of their bodies, was pleasing or affirming. However, one of the dancers thought the model seemed robotic, even though she acknowledged that it represented her. This same dancer commented that the model would be an effective teaching tool; looking at many different bodies performing the same motion would enable her to see trends and individual differences (Summary of Summer Interviews).

While watching the model, the dancers compared recollections of their performance to the stick figure representations; however they also had an emotional

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<sup>41</sup> The quantitative data revealed that more skilled dancers had more movement in the pelvis. Data from the two rond de jambe studies can be found in Appendix B.

response to seeing the model of their bodies. Several of the dancers liked seeing their bodies without judgment because the model did not show the contour of their bodies. One of the dancers commented that she could finally see what her teacher sees. Seeing the model changed another participant's understanding of performing the movement. She noted that the visual image she took away from watching the video and the model would serve as an image for doing rond de jambe in the future. For one dancer, the model presented her body to her in a different way – what she called “cartoon bones.” The visual information enabled her see how the bones moved, giving her an idea of how her body was moving. Yet, for another, the detail of the model interfered with her ability to see the whole picture – in the model she only focused on the body in segments, which reminded her of mime movements (Summary of Summer Interviews). But were the dancers' observations and comments comparable with what they were feeling while doing the rond de jambe?

Watching the computer model raised as many questions as it answered, but it was also useful to the dancers in a myriad of ways. There was discussion about the standing leg, and the importance of that leg strongly supporting the off-balanced pelvis. The dancers could easily observe the movement of the pelvis and the interactions between the pelvis and each leg. In addition, the model illustrated timing and pathways, and it clearly revealed whether the dancer focused on the individual positions (front, side and back) or the entire action.

During the interviews, the dancers tried to balance their “felt experiences” with the feedback they were getting from the model. The movement in the pelvis when the leg moved to high front, devant à la hauteur, and the lateral flexion in the spine when the leg moved to the side, à la seconde, fascinated many of the dancers. And while most of the dancers stated that they trusted the data, perhaps even more than they trusted sensation, when the model showed a bent leg or more hyperextension than they expected to see they questioned its accuracy (Summary, Summer Interviews).

Many of the dancers also had questions about how to apply the ideas that developed from watching the model. One participant, who was teaching Ballet at the time, noted that the model information would not change the way she taught rond de jambe. She had developed her own way of teaching and coaching that worked well for her. Another dancer seemed troubled by the interface between science and aesthetics; this dancer asked, “Just because you can do something efficiently, is it good”? (Janelle, Summer Interview, 06/07/05) Although these two women acknowledged learning something about how they performed grand rond de jambe en l’air in the process, perhaps the most important reflection for these two dancers was to identify what they valued in their understanding of dance.

The rond de jambe study allowed me to provide an outside environment for a few of the dancers also taking the Experiential Anatomy course to continue processing the anatomic and somatic information. Several of the students did acknowledge that the experience of being in the rond de jambe study gave them another opportunity to reflect on their bodies and their dancing. And while the dancers were observing their

performance displaced by time, and as an abstract representation (computer model), they were gaining additional information about their bodies. The pedagogical value in the study was revealed when the dancers reflected on what they saw in the model, particularly as the information aligned, or did not align, with their recollection of performing rond de jambe and understanding of how they thought rond de jambe should be performed.

### The Pedagogy of Research

As was discussed at the end of Chapter II, the symbiotic relationship between teaching, learning and the research was an important and unique aspect in this study. The research was shaped by a desire to understand how students learn and come to know in their bodies. The teaching was structured to facilitate the research, and the students' experiences influenced the research and the subsequent teaching. The synthesizing element in this cycle was two-fold. First, there was a strong commitment from the dancers to this process and second, throughout the courses and activities associated with the study there was open and frequent communication.

The communication happened on many levels, both in the courses and in the data generated from the journals and interviews. Sarah and I structured the courses to support concurrent discovery and understanding. This was experienced by the teachers and students alike, therefore questions and comments from the students always balanced the formal presentation of information. Many times the most effective communication was when Sarah or I were experiencing something in their bodies—trying to get a “feeling”

for an answer or explanation—or when two people were working together using touch. These examples reveal the oral, real-time communication that took place in the courses.

Another form of communication was in the dancers' journals and the follow-up interviews. The dancers wrote openly in their journals, and I commented on most of the entries before returning the journals to the students. Sometimes the students responded to the comments and questions I posed in later journal entries, therefore the journals provided a space for private conversation between the students and me.

During each of the courses, and during the interactions that followed once the courses were over, I felt that the dancers involved knew they were sharing something with Sarah and me that we were deeply committed to. Particularly during the follow-up interviews I realized that the dancers had engaged with the research on a level that exceeded mere participation; they were very committed to the courses and projects in which they were involved. The dancer's belief that they would come to "know" in their bodies, and their willingness and commitment to enter into the process was as important as any information presented in class; it laid the seeds for confidence, acceptance, and faith in the process for the dancers. I was both grateful and flattered by their willingness to share in the process. The effect that this had on their learning, and the data gathered in this study cannot be measured, but it was (and still is) palpable.

### *Pedagogy Begets Pedagogy*

What if dance schools focused on "getting the movement" rather than doing it? What if the whole year focused on jumping rather than learning the recital routine – how would this change our levels of technique ... what if dance schools – whose primary focus was on children – would teach somatics?" (Amye, Journal Entry, Experiential Anatomy, 04/22/05)

Several of the dancers from both Experiential Anatomy classes fulfilled their graduate assistantships at Texas Woman's University by teaching technique courses in the department. I will refer to these participants in the role of *students/teachers*, as they were simultaneously engaged in both. This section addresses how these participants took their experiences forward in their roles as teachers.

During follow-up interviews conducted six to eighteen months after the Experiential Anatomy courses, many of these women talked about their teaching experiences. Without exception, each of these *students/teachers* indicated, both directly and indirectly, that their current teaching experiences provided them with a venue for applying the anatomic or somatic concepts from the Experiential Anatomy course. While one noted that the anatomical information had been very helpful for her, another felt she had taken forward only the somatic concepts and approach. The latter *student/teacher* was trying to learn how to extend one idea (e.g. head-tail) all throughout a class so the students could connect the concept to their dancing. This same *student/teacher* commented that she and her students were discovering things about the body, and about movement, together (Summary, Follow-up Interviews).

While these *students/teachers* were enthusiastically incorporating some of the concepts from their Experiential Anatomy courses into courses they were teaching, most of them mentioned that they needed to go through technique to take their students to sensory information or awareness; that there needed to be a movement context for the anatomic and somatic information. For example, Isabel, a participant in the 2004

Experiential Anatomy course, taught a dance major's ballet class eighteen months after she took the course. In the follow-up interview with Isabel, she commented that although her ballet students had previously only learned patterns and steps, and therefore learned to dance with a very tight or bound feeling, she felt that they needed to understand how the form of ballet related to feeling the movement. Isabel asked her students to focus on *what* they were experiencing, but she knew they were having difficulty with her approach. However, she was confident that this experience would allow them to understand the form of ballet by exploring it in an embodied way (Follow-up Interview, 10/23/05).

Isabel also discussed the importance of teaching her students to focus on movement qualities. In asking her students to go beyond just “doing” the steps, Isabel wanted them to understand the difference between seeing and feeling a movement. She was also introducing her students to the interface between image and feeling. And while Isabel's pedagogy had been clearly shaped by many things, she mentioned that she used the information from the Experiential Anatomy course as principles. She gave the example of following anatomic truth in the body. Isabel commented, “I know [these principles] are in my body and I am learning how to articulate them ... making a connection in my body is more important than technique. This is what I want to pass on to my students” (Follow-up Interview, 10/23/05).

Miche used imagery in her pedagogy, basing these images on specific body parts in action. In using these images, she observed the development of a different weight quality and a more noticeable spatial focus in her students' dancing. As Miche and I

discussed during the follow-up interview, she felt that the images helped the students move beyond simply making shapes with their bodies. Miche also had her students close their eyes during the exercises at the beginning of class so they could focus on spatial and temporal elements in their dancing. By having her students close their eyes, they eliminated tension in the movement that resulted from watching themselves in the mirror. As Miche described it, once the students adjusted to having their eyes closed, their movement was much fuller. Without relying on visual information, Miche felt the dancers could attend to their movement, attend to sensation, and find their own internal timing. Dancing with their eyes closed also eliminated peer pressure and Miche saw more confidence in her students' movements. Miche felt these two strategies had changed her students' performance, and she acknowledged that she had also integrated these ideas with her own movement as well. By processing the information she was giving her students, she was continuing to focus on some of the somatic information she had been introduced to previously (Follow-up Interview, 10/23/05).

Roberta combined principles from Laban/Bartenieff and the Experiential Anatomy course in her pedagogy. She used the concept "head-tail",<sup>42</sup> for example, to help students find a different way to think about their bodies when dancing. Interestingly, Roberta also noted that her pedagogy was influencing her dancing (Summary, Follow-up Interviews).

<sup>42</sup> This refers to spinal patterning in Bartenieff Fundamentals. Spinal movement involves the ends of the spine – the skull and the sacrum/coccyx. For more on this see Hackney (2000), p. 23.

While the *students/teachers* did not articulate this directly, they had embodied a somatic orientation in their teaching philosophies. Miche wanted her students to understand the difference between feeling the movement in their bodies and seeing the reflection of it in the mirror. And when Isabel asked her students where the initiation for a movement came from, and what the quality or timing should be instead of just focusing on the “steps”, she was asking them to develop *awareness* of the movement that they will take into performance.

As they taught, these *students/teachers* were also developing different relationships with their own bodies. Amye discussed a phenomenon she had discovered when teaching: she could sense her body therefore she knew she was “communicating” with her body. In contrast, another *student/teacher* noted that when she was teaching she got nervous and felt as if she was “out of her body.” As we discussed this concern, this latter *student/teacher* recognized that while her body was there for her, and was helping her communicate, this relationship to her body was a novel one for her (Follow-up Interview, 11/18/05).

Finally, as the last *student/teacher* example in this section, and involving a different dance style than has been discussed in this chapter, Gayanne was working with a high school drill team both during the 2005 Experiential Anatomy course and follow-up interviews. Drill team emphasizes precision style movement and requires all dancers to move in complete unison, regardless of the shape or size of their bodies. At various times throughout the Experiential Anatomy course, Gayanne discussed wanting to use a somatic approach with the young women she was working with. Many of her journal

entries addressed how the body-centered explorations she experienced in the Experiential Anatomy class would benefit her students. During the week Gayanne would experiment with the explorations she had learned in the Experiential Anatomy class with her drill team students; the following Friday she wrote about how a bodily centered perspective had affected these dancers. I asked Gayanne how she evaluated the effect of working with somatic information during a follow-up interview. At first she hesitated, but she quickly acknowledged that the body-centered experiences had an immediate effect on their confidence in performing certain movements (Follow-up Interview, 12/16/05).

*Who Was Teaching Whom?*

It was my great fortune in this research to work with intelligent, sensitive, and dedicated participants. While I can take credit for creating the need for the classes to be taught and bringing my sensibilities, aspirations and qualified answers to the process, the dancers and my colleagues brought all the rest. Their curiosity, their willingness to question, challenge, process and adapt to the ideas and information I presented; their honesty and openness about how they did or did not take the information forward; and their unwavering support for me as a researcher, a mentor, a mother figure and a struggling student, were always present, even after I left the program. I know that each of them learned something through her participation in the research. Every dancer left the research with information that was valuable to her; however, I am convinced that I learned more than my students did. To witness, discuss and probe further into the dancers' experiences revealed more to me than I could have possibly hoped for. And while my students and I were looking at the same phenomena, we approached them from

different angles. The students made me question assumptions I entered into the research with and confirmed suspicions I had about how they were processing their experiences. There were many surprises and yet there were also many pleasant affirmations.

Miche and Isabel, two dancers who took the 2004 Experiential Anatomy course, participated in many aspects of the research, including the pilot study for the rond de jambe study, and the two years of data collection, in addition, they graciously consented to four interviews throughout the study. This dissertation is full of many quotes from these women; observing the context and the dates for these comments, one can easily see the changes they experienced. In the last interviews, completed with each of them during their final semester at TWU, their recollections of the course were brief, but the interviews contained a wealth of information about their journeys over their three years as students pursuing their MFA's in Dance.

Miche's journey, which began in pain and frustration, developed when she could apply what she had learned from the Experiential Anatomy course to her own pedagogy, and ended in reflection about how somatics might be best taught. Miche felt challenged by the Experiential Anatomy course on many levels, but most of them were personal reasons. She came to TWU to dance, and initially she found the focus on somatics took her away from her dancing. Nevertheless, she felt that she needed to invest in the somatic experiences and contribute to the course community, despite wondering many times if she really felt things in her body. Although she struggled with somatic practices, Miche respected the anatomical information and the presentation – particularly when she thought it would contribute to her development as a dancer.

For Miche, the greatest application was not to her dancing, but to her teaching. Miche discussed being open to somatics as an educator because it made her teaching experience richer; it offered a way to get the students to dance more deeply. As she explained, the explorations she used in her courses increased the students' interest; these experiences opened a door for them. As a result, Miche could see how the dancers' movements changed; that there was a different physical experience for them. And yet she remained skeptical. Although Miche often saw her students acknowledge or comment on sensation or understanding, five minutes later she could see there was not complete understanding because there was no application to the exercise. Miche's MFA professional paper addressed her ideas for incorporating somatics into the curriculum and included well reasoned arguments for when to include the information as well as how.

Isabel—fiery, independent, vocal, and adamant—hardly changed at all during the three years. She was “very embracing,” to use her words, of everything she experienced, reasoning through her experiences verbally, physically and through her choreography. During our 2005 summer interview, she commented, “I think I am learning about my body – knowing what to do, it is choice making. I listen to my body ...” (Follow-up Interview, 05/31/05). The following spring Isabel commented that what she had really discovered about herself was that she liked the physicality of moving—of her body moving—and the strength, resilience and authority that movement gave her.

For example, Isabel discussed discovering an increased range in her Effort qualities and could pinpoint exact moments in the past three years when she felt those changes had taken place. And yet, I could always see Isabel challenging herself to access

her body, not in a performative way, but one that was experiential, somatic or sensed.

And in the end, this determination had a remarkable effect on her performance skills and choreography.

Miche and Isabel will enter the field of dance in different ways, follow different trajectories and have very different (but I predict) successful careers. During their three years as graduate students at TWU they both had experiences and opportunities that defined and refined who they are as women, and as artists. Both developed complex relationships with the information and experiences they were introduced to in the first Experiential Anatomy course. Each took away only what was beneficial to her. Their perspectives on dancing, teaching and somatics were clearly influenced by their relationships with their bodies, and this information will continue to evolve.

In April 2006, I also interviewed Sarah Gamblin, my colleague in the Experiential Anatomy classes at Texas Woman's University. At that time, Sarah was teaching the Experiential Anatomy course by herself; our conversation focused primarily her experience teaching the course on her own.<sup>43</sup>

Sarah and I discussed the merits of knowing the names of bones and bony landmarks as well as sensing their location and function. This knowledge had enhanced her dancing and she felt that it would also benefit her students. As Sarah described it, "you have an intuition and you use the facts to support you or encourage you to question what you are experiencing." The language and orientation of science have helped Sarah to understand bodily sensations she was processing. Sarah discussed the importance of

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<sup>43</sup> All of the quotes in this section are taken from that interview, conducted April 22<sup>nd</sup>, 2006.

using a common set of terms, for example, trochanter or scapula, to identify these sensations or to begin to answer questions about the body. This related to her definition of somatics as a body of knowledge: *feeling* in relationship to a concept, and she uses somatics as a teaching tool.

By asking her the students to attend to feeling what they are doing—what Sarah calls internal focus—the students are getting a somatic experience. Yet Sarah was still considering where somatic experience fit in for her students. She wondered how they could link their successes in dance practice. For example, in a combination, when their movements feel good and beautiful; can the dancers connect that to information about their bodies? In other words, can they find a way to move well and feel good?

We also discussed the use of images and how imagery interfaces, or interferes, with learning. Motor learning theory<sup>44</sup> informs Sarah's teaching, she is interested in how people learn, specifically the stages dancers go through when they are learning and experiencing movement somatically. In addition, understanding the structure and organization of the body has helped Sarah create a theory about how her body functions in dance.

Sarah is very clear about what she knows about her body, what information she gets from her body, and how this informs her dancing. While Sarah focuses on her body in training, in performance she attends more to momentum, space, falling, and impulses for movement; when she is dancing she doesn't think about her body in terms of technical models.

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<sup>44</sup> Sarah uses McGill (1998) as a reference in her discussions of motor learning.

Sarah's students and colleagues marvel at the clarity, the articulate beauty, the weight and effortlessness of her dancing, her teaching and her ability to discuss all of these in an embodied way. Sarah has found vocabulary for analyzing, discussing and presenting the information she gets from her body and this, as strongly in concert with her other gifts, will help her students begin to develop a similar means for communicating what they know in their bodies.

There are many things I learned from these three women, indelible lessons that have strongly confirmed my pedagogic beliefs. From Miche, I am reminded that the students need time, confidence and a context for the presented material and that in providing information and experiences about the body, I have the opportunity to experience these in my own dancing as well. From Isabel, I learned that the true application of the information is in the physicality of movement, and that understanding the body should enable the dancer to fully explore all Efforts and extremes along the way. And from Sarah, the somatic embodiment of the information she gets from her body is a strong part of her pedagogy, yet this is strongly anchored in the scientific concepts she believes in.

### Learning About Learning

In the process of conducting this multi-faceted project, I was a researcher, a teacher and a student. As a TWU doctoral student in residence, I was encouraged to take dance technique courses to balance out my academic load. These courses provided opportunities both to (re)invigorate my dancing and to have time to reflect on my teaching. Among the many courses I was able to take, during Spring 2005, I enrolled in

Modern IV with Sarah Gamblin, along with several of my students from Experiential Anatomy.

More than in any of the technique courses in which I participated as a student at TWU, this class required me to process information on many levels. First, I compared how Sarah's teaching style was similar to mine and how we differed. At the same time, I was (re) experiencing being a student, trying to interpret and learn complex movement cued visually and verbally. I was also trying to learn the movement sequences as quickly as the other students learned (yet they far out-paced me). Finally, I was trying to experience how my intellectual and physical understanding of my body informed my dancing.

As a *student* in Modern IV I was able to observe how Sarah integrated some of the concepts from our shared Experiential Anatomy course into her daily technique class; as a *teacher*, I was able to observe how the other Modern IV students processed this experience. Of course the dancers saw the connection between the two courses, even if they did not write about it in their journals, but the energy in a dance technique class, far from the contemplative, explorative somatic classroom, asked them to process the information differently. Most of the dancers, enrolled in the two courses simultaneously, were developing a physical understanding of weight and initiation in their bodies. However, I also observed the students who were not simultaneously enrolled in Experiential Anatomy. The referenced anatomical information Sarah presented in Modern IV was not lost on these students, they simply developed a different relationship

to the information and ideas Sarah was exploring than did those students also participating in my study.

I recognized a very strong connection between Sarah's pedagogy in both Modern IV and Experiential Anatomy. As a *student*, I found this was very helpful; as a *teacher*, it offered a unique opportunity to integrate the somatic work in the Experiential Anatomy course into a more holistic movement context.

### *Learning About Learning (II)*

During the winter breaks from my doctoral studies at TWU, I endeavored to learn to skate ski at the Happy Jack Recreational ski area, east of Laramie, WY, far from the dance department or biomechanics laboratory at Texas Woman's University. Like dancing, this variation on cross-country skiing—designed for speed—requires balance and timing. The skis are narrow (4.4 cm wide) and approximately the same length as my body height (185cm). When mastered, the technique is effortless and beautiful; I cannot say the same for the learning of the rudimentary motions that establish the framework for this sport. In order to master the different techniques, V-I, V-II and V-II Alternate<sup>45</sup> one must integrate core connectivity and strength, balance, shifting of weight and integration of the Upper and Lower body.<sup>46</sup>

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<sup>45</sup> The "V" refers to the shape your skis form while striding, and the "I" refers to the use of your dominant side. While both skis are used to push and glide, the V-1 requires pushing off with both poles only on strides from the dominant side.

<sup>46</sup> These concepts are integral to Bartenieff Fundamentals, see Hackney (2000).

I have danced for many years, and I feel that my body informs me when I am moving; I can sense the location of my weight, timing and spatial elements in my body when I am dancing. Although I know there is specificity to this knowledge, I appreciate that there *could* be transfer of these physical skills from one activity to another. And yet, I also know that know that in many cases there is not transfer. This was indeed the case for me learning to skate ski, as my strengths as a dancer disappeared when I put on my skis! Perhaps I have forgotten how long it took me to develop competence and confidence with my dancing; however it seemed to take forever to develop a feeling for skate skiing. As I wrote,

Struggling with the balance - trying to stay in the vertical plane - finding the rhythm and the timing and the power... I think this has been the hardest for me – not simply going with momentum but finding the power. I know I am falling out of balance rather than using my center over the ski to give me good power in the legs. And yet, there are fleeting moments when it comes together. (Researcher's Journal Entry 12/09/05)

And later that month,

How many days skiing...how many times has Neil pointed out to me that I am not bending my knees enough? I always felt as if I was bending them, after all I know what plie feels like.... and yet, today, although I know I started to make progress bending my knees more sometime last week, going up a long hill going up I realized that indeed I have *not* been bending my knees (enough) and when I did, it felt totally different. It reinforces how long it takes to create and then act upon, perception. (Researcher's Journal Entry, 12/30/ 05)

Whereas skate skiing is an activity outside of the parameters of this study, in many respects this process of understanding my body when skiing reflects on how students develop an understanding of their bodies when learning to dance. Both disciplines embody specific techniques comprised of detailed and complex movements;

both respond to changes in the environment (temporal and spatial), that effect effort and exertion; both require interaction with others. Understanding and responding to these diverse demands in the body, is no different in learning to ski than in dancing. Stepping away from dance enabled me to reflect on what I know in my know in my body and how I can transfer that to skiing so I could better contextualize how the dancers in this study were negotiating a new way of thinking about their bodies in movement.

I have learned that sometimes the information we get from our bodies can interfere with the disciplinary demands, be it skate skiing, grand rond de jambe or a spiral to the floor. General body knowledge, or knowing in one's body, provides a framework from where one can hone in on specific detail; however, it remains unique to the individual. What dancers know in their bodies' often has only a specific application; therefore dancers must learn to negotiate particular detail within the larger framework of general body knowledge. I know that I can access my bodily knowledge and my knowledge of the body when moving. I also know that I can dance, ski and teach without consciously having to access this information, because my body knows how to fulfill the disciplinary demands of each.

### *Pedagogy Transported*

Upon completion of my course work and research at Texas Woman's University, I returned to the University of Wyoming (AY 2005-06) to resume full time teaching. My teaching load was exclusively in the dance studio; therefore, my objective was to bring an experiential focus to these classes. The remainder of this section discusses how I introduced the topics in these classes and the students' general responses.

In teaching Advanced Modern Dance, I asked the students to identify and locate landmarks in their bodies and then attend to the somatic information as they integrated these concepts with their dancing. Using Olson's *Body Stories* as a text to guide the explorations of the different parts of the body, we started with the pelvis—the center of the body—and worked out from there, moving up and down and in all directions, both metaphorically and literally. At the beginning of each class, I introduced specific locations or landmarks for the dancers to locate in their bodies. Once located, the dancers could reference these points to initiate movement. Interestingly, I found that focusing on the body not only helped me organize concepts for teaching, but also pushed me to explore new and physically challenging movement.

Secondly, I asked the dancers to attend to internal and external information and to find the balance between tension and release in their bodies. Working from initiation from the pelvis, femur, or scapula, helped the dancers develop clarity in their movement qualities; sensing the weight of these body parts helped them move more instinctively. They learned to let their bodies lead, rather than focusing on a particular shape. The focus on parts of the body also gave the dancers a new context for thinking about their bodies while they danced, enhancing their abilities to trust their bodies in movement. And yet, the dancers were also trying to distinguish between initiation and follow-through for movements that they knew to be detailed and precise.

Working with specific information about the body gave the dancers more awareness of their physicality and their spatial relationships. Most of the students enjoyed initiating movements from specific body parts – they felt this helped them feel

more involved with their bodies. Several students commented that initiating movement from a specific body part took them to weight and momentum; this was a new sensation for many of them. Like the dancers at TWU, many of these dancers recognized how they could apply these techniques to other dancer styles, and how accessing the body could create a change in their movements, and like the TWU students, they also discussed having to “think about these things.”

During the Spring 2006 semester, I used Franklin’s *Dynamic Alignment through Imagery* as a text. My goal for this course was to introduce imagery as a way to focus the dancers’ attention on their bodies or on specific movement qualities. In their journals, the dancers often discussed which images worked best for them and why, as well as their emotional responses to the images—particularly when these responses were negative. However, many of the dancers simply classified the images as “interesting.” Without exception, the information and images relating to breath were the most profound for the dancers. Many of the dancers wrote about how thinking about breathing challenged them to reconsider the relationships they had with their bodies, with movement (and how they learned it), and with the environment.

In these two semester long courses, there was occasion for the dancers’ experiences to evolve throughout the year. There was a comfortable amount of time to visit and revisit the concepts presented. And, while the dancers became more comfortable with the process of using imagery, or initiating movement from specific body parts – at the end of the second semester they were still negotiating when to “think about the body” and when to let go and “just dance.” However, none of the dancers saw

this process as a continuum; instead they viewed it as a dichotomy. Throughout the two semesters, I was working to give the students choices, to show them how to link focusing on their bodies and improvisation to the sensations they were processing in my classes and with other dance forms they were studying. But in addition to this, looking back on these courses I can clearly see evidence of how my pedagogy had been reshaped by my research.

### Summary

In this last data chapter, the pedagogical aspects of the research have been presented. The pedagogy used in the research fulfilled the goals of the overall project and the goals of the research simultaneously shaped the teaching. Following the dancers in the study through time, I was able to see how each took the information and experiences forward in their teaching: how they experience the body as teachers. Throughout the study, I reflected on learning, on teaching and how the dancers (students, colleagues and I) need, use and transfer information about the body. The next chapter applies the data from Chapters III, IV, V and VI in a theoretical perspective, one that addresses how dancers come to know in their bodies.

## CHAPTER VII

### DEVELOPING CONSTRUCTS AND A THEORETICAL PERSPECTIVE

In this chapter I 1) summarize how the dancers made meaning from their experiences in the study, revealing the strategies of experience, integration and reflection; 2) present the constructs that I developed from the grounded theory analysis; and 3) draw from the literature to create a lens through which to observe how the constructs lead to concepts for theorizing. This chapter thus provides a framework for theorizing from the data about how dancers come to know in their bodies. Figure 6 (p. 247) summarizes all of the information presented in this chapter, however smaller sections of this diagram will be used to introduce each area of discussion. We begin with dancers in a world of dance, studying anatomy and somatics.

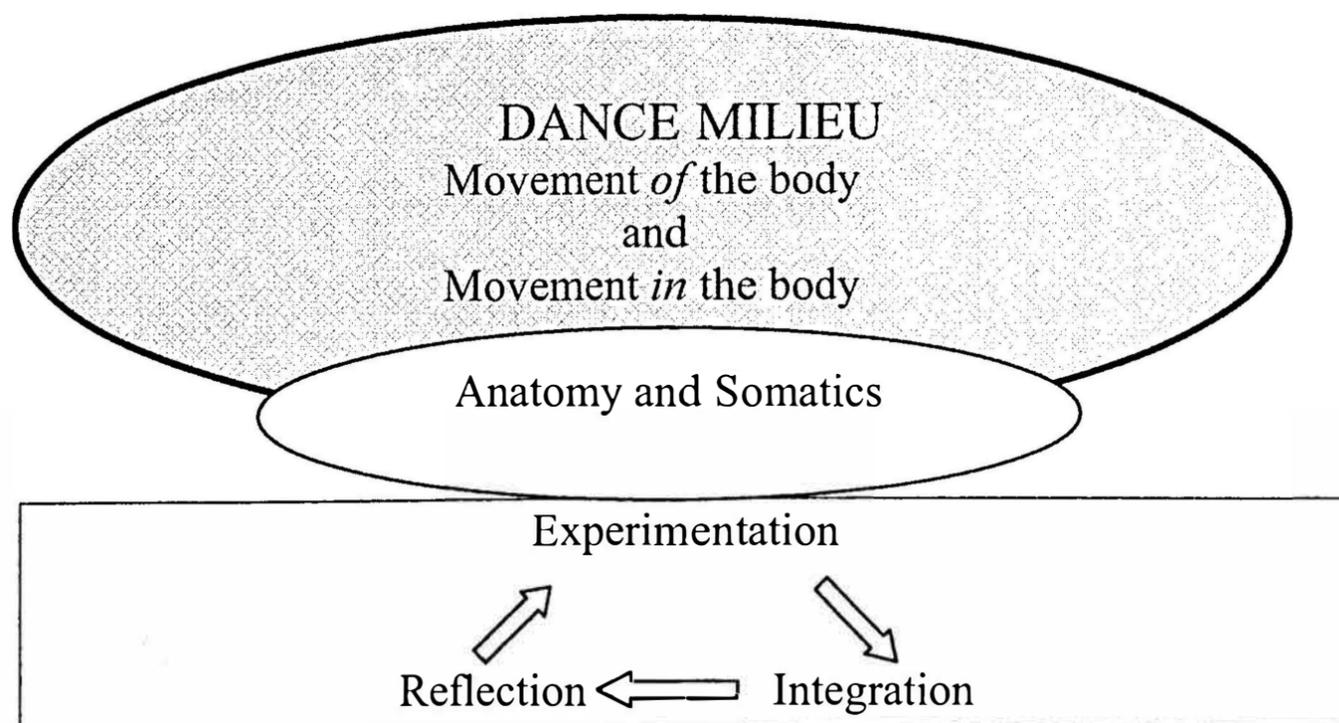


Figure 1: Dancers in a world of dance, studying anatomy and somatics.

## How the Dancers Made Meaning

This first section identifies the processes that the dancers used in the research to make meaning of the information presented. The dancers used three strategies: experimentation, integration and reflection. These three elements will initially be presented as individual processes; however, they function both in a cyclical manner, as illustrated in the previous diagram, and provide the foundation for the constructs that will be presented in the second section. The first process is that of experience or experimentation.

### *Experience/Experimentation*

Ellsworth (2005) reminds us that “experience is not subjective in the sense that I have an experience ... we do not *have* experiences; we *are* experiences” (p. 26). The dancers clearly demonstrated this assertion in the current study. As Amye noted, for example, “I am obtaining information about MY body and MY ways of using my body to execute movement. I am also learning that not [all bodies] are exactly the same and we all work in different ways” (Journal Entry, Experiential Anatomy 03/04/05). Amye’s comment emphasizes the individual nature of experience and, although she does not use the word experience, this is clearly the process she is using in coming to understand her body.

As Amye’s journal entry indicates, dancers learn experientially: as dancers move, they are processing both kinesthetic and proprioceptive information. Throughout the study, I observed this on two levels: first, through observation and patterning, and next, through exploration or by keying in to sensation. At the first level, a dancer observes a

movement and discovers how to create the same action in her body. Although this is accomplished primarily by visual patterning, the process requires the dancer to integrate feedback and specific stylistic elements. Through repetition, the dancer develops a “feeling for the movement.” The second level, however, is where the dancer develops a “feeling for her own body.”

Through experiential work, a dancer comes into contact with her body and her self. Experiential work provides a place of epistemic connection that lays the groundwork for dancers to develop knowledge in their bodies. Yet experiential work alone is not enough to create knowledge; the information must be integrated into the dancer’s dancing.

### *Integration*

The second strategy the dancers employed was integration. Fauconnier and Turner (2001) write, “while we construe the physical, mental, and social worlds we live in by virtue of the integrations we achieve... integration is one of the essential means we have for apprehending and constructing our world” (p. 7).<sup>47</sup> As dancers think about and feel their (own) bodies moving, they develop physical awareness of information about their bodies; through time they begin to integrate information both from their internal environments and the environments in which they dance. For example, in the following excerpt from a follow-up interview, Marta discusses how she incorporates breath into performance. “Sometimes I use breath to initiate a movement. On stage, everything

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<sup>47</sup> Conceptual integration is based on dynamic systems and cognitive science, which both address our interactions with the world, based on everyday experience. See Fauconnier & Turner (2001)

comes together and works as a whole because I have been working on it so much in class” (Follow-up Interview, 11/18/05). For Marta, the integration of breath was facilitated through practice, and she acknowledged that breath was integral to her performance both in class and on stage.

A dancer who has integrated information from her body into her performance brings a quality of movement that transforms her dancing beyond simple steps and movements. As Richard Shusterman, pragmatist philosopher and Feldenkrais Technique practitioner, explains, “self conscious somatic focusing enhances our experience with added richness, discoveries, and pleasures that heightened awareness can bring” (2006, p. 164). A dancer who has integrated information (consciously or not) brings a particular quality to her dancing that transforms even the most codified techniques. And, while experimentation and integration are ways a dancer actively mediates her body in the world, she must make some acknowledgement of this to herself. Therefore knowledge acquired through experimentation and integration is revealed in the dancer’s dancing, as well as through her reflections.

### *Reflection*

As a dancer reflects on the process of experimentation and integration, she develops not only a physical confidence, but also the ability to evaluate her own movement. As Boud et al (1985) explain, this reflection functions as a personal synthesis. Reflection includes “integration and appropriation of knowledge, the validation of personal knowledge, a new affective state, or the decision to engage in some further activity” (p. 20). This reflection is not necessarily a measure of what others

perceive as correct; instead it indicates what feels “right” in the dancer’s body. This knowledge is informed by anatomic, somatic and artistic information and manifested as physical sensation, a reflective affirmation, or both.<sup>48</sup> In other words, while reflecting on their experiences, dancers come to understand themselves.

In this research, the dancers’ journals were full of reflective statements that summarized experiences they had during the classes. Many of these entries documented discoveries the dancers were making about their bodies. This reflection was important for them to concretize their experiences and find meaning in them. For example, during the study, Bridget asked the following questions:

I have been thinking a lot about the development of body awareness this week. How does one develop body awareness? How long does it take? Is this development subjective to each individual? And does awareness have any correlation with intelligence? (Journal Entry, 02/18/05)

At the end of the semester Bridget concluded, “I [have] realized something else about my body: it was always changing” (Body Story, 04/28/05). Bridget’s decision to engage with her increased self awareness challenged her initial belief that she should incorporate this information with her dancing. However, in the end, she realized that “the knowledge I have gained is invaluable because although I may not have the answers, I now have the power to ask the questions” (Journal Entry, 04/28/05). This reflective process occurred during the courses and continued after the courses ended.

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<sup>48</sup> However, as all dancers’ bodies and capacities are different, the match between performing the movement correctly and feeling that it was right in the dancers’ bodies is of no concern here.

The follow-up interviews, conducted six months after the 2005 Experiential Anatomy course, revealed that the dancers were continuing to reflect on their experiences. For example, Janelle discussed:

Last semester I was completely immersed in somatics, but now I am taking courses with a different focus. Each semester has been distinct, so while I have chosen not to use the anatomical or somatic language, I know I have retained some of the concepts and I am paying more attention to my body, but I am most interested in the physicality of being a dancer, of taking the somatic material to the next level. (Follow-up Interview, 10/24/05)

Janelle's focus and attention had changed over time. However, rather than dismissing the value of the earlier information her comments in the follow-up interview convey her feeling that she had integrated somatic concepts into her movement to the point where conscious attention was no longer necessary.

In both Bridget and Janelle's entries, it is also important to acknowledge the physical aspect of reflection. While the dancers have developed their discussion of reflection—thinking about—it seems clear that they also engage in physical reflection. The data from this research show that the dancers were making meaning from the anatomic and somatic information in two ways. They were developing both internal and external references for understanding their bodies: each dancer developed a sense of a dancing body and her (own) dancing body. For this reason, I will use the term *embodied reflection* to acknowledge the ways the dancers were reflecting.

Experience, integration, and embodied reflection comprised each dancer's subjective negotiations with her body and the world of dance. The dancers used these three processes in the courses in the research, thus experimentation, integration and

embodied reflection serve as a foundation for the presentation and understanding of the constructs that emerged from the grounded theory treatment of the data.

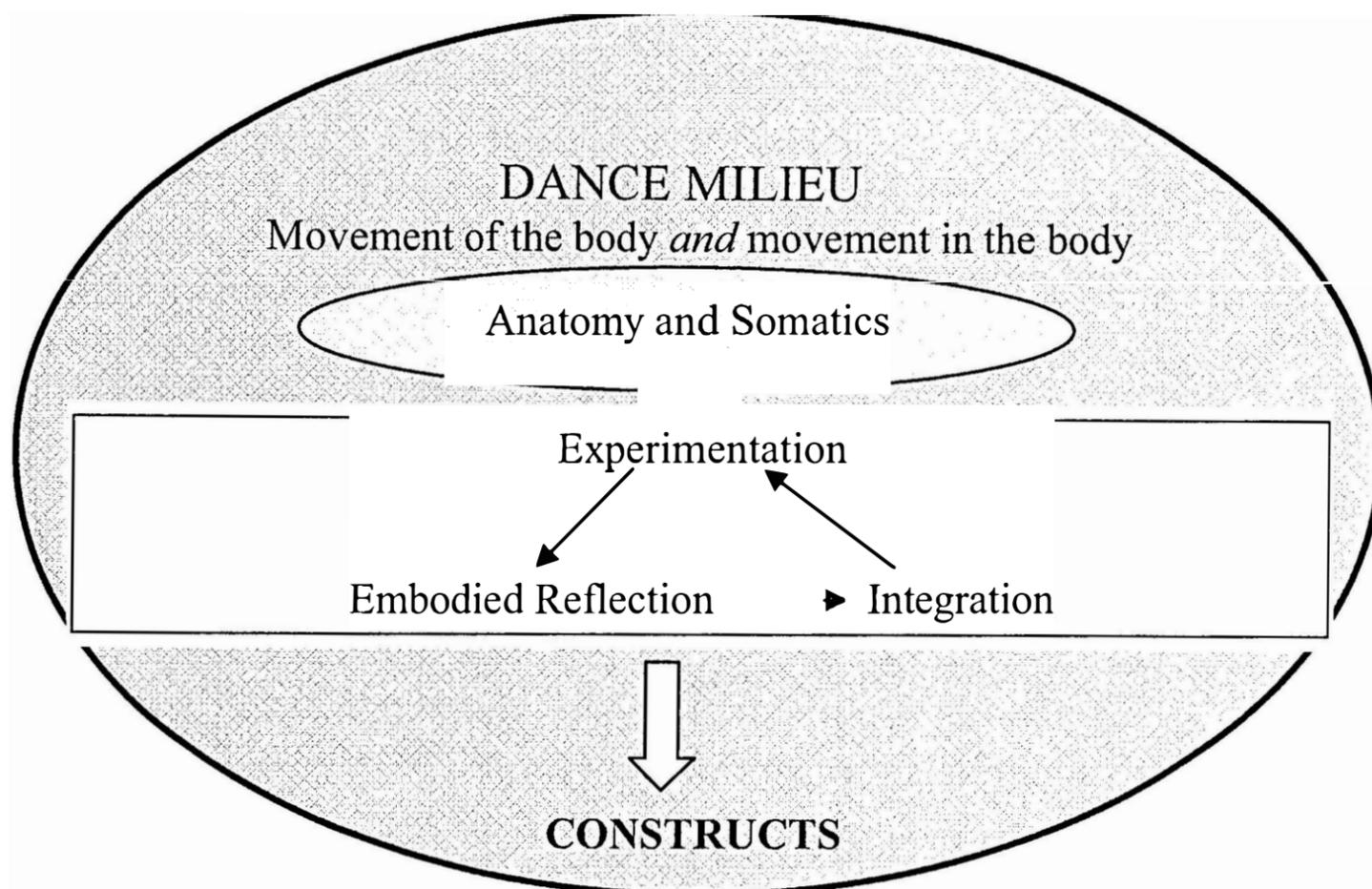


Figure 2: Development of constructs

### Constructs from the Data

The four themes, or constructs, that emerged from the data synthesize the various participants' experiences and create a narrative for the theoretical perspective. These four constructs include the following: 1) Dancers learn to bring diverse information and dualities into balance. 2) The experience of attention to the body occurs at a specific moment in time; integration, embodied reflection and knowing develop over time. 3) Meaningful application focuses and clarifies specific information for dancers through

integration of the information in intersections. 4) Accessing and integrating specific information about movement and moving are skills that dancers acquire; individual experiences reveal multiple modes of embodied reflection, embodiment and communication. In summary, the experience of a dancer exploring movement ideas in her body clarifies movement of the body, particularly in application, yet each experience is unique to the individual dancer. These constructs are discussed in more depth in the following sections.

#### *Dancers Learn to Bring Diverse Information and Dualities Into Balance*

In classes, rehearsals and performances, dancers must negotiate seemingly disparate ideas and information from three areas: 1) perceptions of the field of dance they hope to enter, 2) various ways of thinking about their bodies, and 3) experiences and information from specific learning environments and performance, including those outside the dance environment. These varied sources of information provide contrasting information that is often viewed as contradictory or conflicting, challenging dancers to balance expectations and outcomes. Examples of these diverse and wide-ranging distinctions include discerning between visual and felt information, between what “feels” and what “is” right. Dancers must also negotiate discomfort and ambiguity, repetition and novelty, language and image, as well as distinguish between fact and myth. Furthermore, dancers must decide where to focus their attention, balancing selective attention amidst an influx of varied information. As dancers manage these perceived binaries, they must also address assumptions they hold about their bodies and about

dance, factoring these preconceptions into the decisions they make and the actions they follow.

However, these apparent dualities or sources of conflicting information in fact comprise a range of experiences that exist in a continuum: the “opposites” balance one another. For example, rather than juxtaposing seeing *versus* feeling as different modes of feedback, with experience, dancers intuitively acknowledge that *both* seeing and feeling provide information to evaluate their dancing. Balancing specific information about their bodies, the movement requirements, and how their bodies integrate these details, dancers learn to negotiate the territory between what “feels” right and what “is” right.

As an illustration, a dancer (representative of many dancers) will initially use visual information as a primary means to evaluate her actions. This visual information is augmented or countered by verbal feedback. Through experimentation, the dancer develops awareness of both efficient and inefficient muscular responses to a given action. Therefore, what “feels right” develops from information that comes from many different experiences, including moving incorrectly. While the dancer integrates and reflects in her body during these physical sensations resulting from the execution of movement, often they can’t describe the physical sensation as well as the visual. The following quote, from Miche, who primarily uses the language of vision to describe sensation, serves as an example:

I like to close my eyes and visualize [movement] because I am still very visual, but it doesn’t have to be looking at myself in the mirror. It is me – a real body, but it is more 3-dimensional than the mirror. I can see every side. I see everything in spatial relation to everything else, but I can see it clearer with my eyes closed. I think it is more somatic – internal. I go to

that place more when my eyes are closed. It depends on the movement and the exercise. I still use imagery - like in plié the tailbone getting closer to the heels and then farther [away]. But I concentrate on what my muscles are doing – am I using them to much? Am I gripping my thighs when I go to relevé? (Follow-up Interview, 10/23/05)

Although Miche speaks about a distinction between seeing and feeling, in fact, the two have merged for her. Thus, Miche’s visual and felt experiences are not opposed; instead, they bring balance to her dancing.

As Miche’s journal entry illustrates, dancers learn to embody or feel diverse information through the *process of moving*, whether in the context of a specific movement in a class or through experimentation. Each dancer makes a conscious intellectual and physical choice to focus on a particular sensation or to integrate specific information into the global actions of her dancing at any given moment. In short, experience, integration and embodied reflection lead to knowledge.

*Attention Occurs at a Moment in Time; Knowing Develops Over Time*

Writing on the body as an intentional object of attention, Fraleigh (1987) differentiates between the body object, body subject and material body:

Body object does not refer to the material body, but to the body that becomes the subject of attention... it is a neutral concept ...body subject refers to pre-reflective consciousness, my body in the present ... body, mind, spirit and soul as lived. (p. 14)

For Fraleigh, the body subject can only be lived, but the body object can be known in the sense that the body itself can become the object of attention. Fraleigh’s phenomenological account is complemented by Lewis (1995), who found that “when learning a new skill there is a bodily awareness which monitors how the body feels, and

which evaluates the body at the same time” (p. 230). During this phase, the experience of the body in action becomes the focus of awareness and may result in the movement feeling awkward. However, once the skill is mastered, attention can shift away from the body toward the completion of the action. Returning to Shusterman’s “heightened awareness” (2006, p. 164), this attention to the body does not remain fixed in time. As a dancer’s worlds change (both internal and external), so does her need for the contextual information. Information that requires initial attention may become integrated through time until the dancer no longer needs to focus on it.

Sensory explorations and specific language create a context for dancers to understand movement, and movement, or dancing, creates a context for dancers to understand about their bodies. For example, once a dancer has completed a movement with explicitly focused short-term attention, she will develop the neuromuscular pathways to integrate the subject of her focus. Janelle discussed this experience in general terms during a follow-up interview that asked her what information she took forward from the Experiential Anatomy class.

In those references to anatomy ... although I am not confident in using anatomical terms ...going through those [anatomical references] gives me a personal confidence in terms of accessing my personal structure – in terms of initiation and everything. (Follow-up Interview, 10/24/05)

As Thelen (2003) explains,

Embodiment is predicated on the continuity of time, where our sensorimotor processes become more refined, faster and more flexible, and offers a continuity of levels where perception and action are tightly woven together. Skilled interactions are not marked by what one really knows “what to do,” but what one does and this requires the seamless

melding of mental events with the changing cues of the here and now. (p. 40)

Over time, a dancer's ability to embody information replaces short term attention to detail. In addition, Thelen's "seamless melding of mental events" explains a dancer's developmental progression from thinking about dancing to dancing.

For some of the dancers, clearly focusing on the body, thinking about the body and even reflecting on the experiences in a given class yielded both positive and negative consequences. In fact, many of the participants in the follow-up interviews mentioned explicitly (but apologetically) that they were no longer thinking about their bodies. Indeed, each dancer acknowledged that the anatomic information had been useful for her; however, for some, thinking about the body anatomically interfered with their dancing. As Meredith noted, "I have tried not to think about it and stay away from my mind with how I feel. Of course I feel my body, but I breathe through it" (Follow-up Interview, 11/19/05). And for Molly, "It is hard to say. I know I use the experience because I had it – but I don't think I actively make a choice to use it. I pay a lot more attention to my body now – how does it feel today?" (Follow-up Interview, 11/18/05)

It is important to ask at this point how deeply the dancers needed to be immersed in the anatomic and somatic material. How long must information about the body be attended to, and how long does it need to stay at a given level of attention before becoming incorporated into a dancer's movement awareness?

Citing studies in neuroimaging, Eagleman (2004) describes two conditions, attending to the intention (I-condition) and motor action. He notes that "attending to the

I-condition activates an internal model of the desired movement... representative of a ‘revving up’ for the motor action” (p. 1145). In other words, attending to the intention precipitates as much activity in the motor area of the brain as does performing the movement itself. Although Eagleman’s hypotheses are based on limited studies, they suggest that attending to intention may produce effective coordination of actions. In fact, as Wilson (2002) writes, “The fact that we are limited in how much we can attend to and absorb in a single brief encounter does not alter the fact that we can and do build up robust, detailed representations with repeated exposure” (p. 632).

While intention and attention are aspects of every dancer’s experience, at some point the information a dancer focuses on becomes embodied as a part of her unconscious, or tacit, knowing.<sup>49</sup> Meredith, an undergraduate student who participated in the rond de jambe study, provided insight on the development of her tacit knowing:

Reflecting back on when I first came here, I knew what [my teachers] were talking about when they referred to the body/mind connection, but my body wasn’t doing it. Now I hear freshmen talking about how they don’t understand the mind/body connection either. I have been telling them just to stick with it and they will get it – it just takes practice.  
(Follow-up Interview, 11/19/06)

And from Marta, a graduate student:

Not only have I noticed a difference, but one of my professors said all of my movements are so much clearer now. I told her I thought it had to do with my knowing about the initiation and which body parts are initiating now – this has allowed me to have more clarity when I am dancing.  
(Follow-up Interview, 11/18/05)

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<sup>49</sup> See Polanyi (1975)

To paraphrase, practicing what Meredith calls a mind/body connection, or linking an understanding of the body with specific aspects of movement, yields what Marta discussed as clarity in her dancing. Attention and intention take the dancer from experience to integration and embodied reflection. But integration also occurs within a specific context or in an intersection with other information the dancer is working with.

### *Meaning Occurs in Intersections*

Whereas information about the body and experiential work might stand alone as subjects of study, dancers find meaning for this information through application. Focusing on the application of kinesiology and somatic information outside of a dance environment can lay the groundwork for the development of application or intersection. Experiential explorations allow dancers to discover sensation in their bodies in a way they might not have discovered during a technique class or in performance.

For example, Melanie was involved in drum corps, working with large flags and rifles in precision choreography. When we discussed how she would apply the information she had learned in *Introduction to Dance as an Art Form*, Melanie replied:

I have started to find patterns in my body... joints in my hands and feet where I tend to go out of alignment. [This happens] either when I am on pointe, when I wing out in my feet, and [also] in color guard. You try to keep the alignment of the hands, [but] I find that my equipment will go awry. It has taken me a year to figure out that I am going out of alignment. (Follow-up Interview, 11/18/05)

Like Melanie, Roberta saw an application of the information she was learning, but within a specific style of movement. As she explained in a follow-up interview, “I have seen more progress in ballet – mostly because I haven’t

been in ballet for the past few semesters. In ballet, I have been trying to find different ways of moving. (Follow-up Interview, 10/24/05)

Given a meaningful vocabulary, applicable concepts, and time to develop awareness of their bodies, dancers can develop a different perspective for thinking about and experiencing movement. Understanding and applying anatomic, somatic and artistic information occurs in meaningful intersections. These intersections combine information from different dance environments (e.g., ballet and drum corps), teaching, preparing for performance and/or working through injuries. Operating as catalysts, these intersections enable the dancers to synthesize information more deeply into their dancing. Miche discussed the intersections she sees in ballet:

I feel if I have a rhythmic flow, doing [the ballet combination] right is doing the action without having to think of the correct thing to do. The words automatically make the connection in my body – I just plug it in so that I know what tombé pas de bourrée is. The legs and the body go through the movement without resistance and knowing how much is needed without me having to be conscious. It is almost subconscious for me – knowing that I do something right is when I don't have to think about how to do it. (Follow-up Interview, 10/23/05)

Points of intersection link specific detail and more global perspectives and serve as a foundation for knowing in the body. And yet, an understanding of the body develops in unplanned ways as well. Roberta discussed intersections in terms of rehabilitation from an injury:

I can tell, even from talking about it now, that [my injury] is translating into my work this semester. My injury has made [my focus on my body] only more apparent. I am definitely thinking about those things – I know I

am trying to feed those principles into my consciousness. (Follow-up Interview, 10/24/05)

Finally, Janelle discussed the social environment as an intersection:

It [a somatic approach to dancing] has become a foundation, but at the same time in this department it is very much a focus – the overriding concern. I think it has been working, and I think it has been great – all dancers should have it at the beginning of our studies, not the end. I think it has worked; it has become part of the natural daily process. (Follow-up Interview, 10/24/05)

Parviainen argues that dancers acquire knowledge of movement gradually in the process of doing dance work. “Dancers acquire meaning as [an] indwelling awareness to produce in their bodies’ movements of a desired form and meaning” (2002, p. 21).

Discovering intersections in application – information about the body applied to a dancer’s dancing—experience, integration and embodied reflection—shape a dancer’s dancing. These intersections synthesize the dancer’s different senses and sensibilities.

When a dancer integrates or embodies information about her body into her dancing, she enters into a relationship with her body, and her dancing, which takes her to expression, artistry and knowing. As Melanie explained in response to a question about “knowing in the body”:

I think it has to do with patterns emerging in the body for a performance. To know something and memorize it in your body is truly learning for the sake of having more knowledge. It is training and untraining, it is learning and unlearning. (Follow-up Interview, 11/18/05)

#### *Discrete Experiences Yield Diverse Modes of Embodiment and Communication*

Information about each dancer’s body can be augmented with both traditional and non-traditional sources of information. Traditional kinesiology looks at the specificity of

the systems of the body, whereas a non-traditional or experiential approach allows the dancer to focus on the application of the scientific information in her body. Rather than studying the body as a model, only learning the language or only reproducing actions based on descriptions of movement, an experiential approach to working with this information gives dancers the opportunity to integrate intellectual knowledge with application in movement. In both a traditional and non-traditional approach, studying the names of muscles and actions of the bones at the joints creates a foundation for understanding the body. However, this information can potentially enhance a dancer's dancing when it is integrated with the context of movement.

One example of a non-traditional approach to learning about the body involves using imagery or metaphor to condense information into manageable pieces.<sup>50</sup> While the images are often visual, the use of imagery leads to the development of a kinesthetic sensation that enhances a dancer's abilities to understand movement in a dynamic situation. Many of the dancers in this study found imagery to be useful for understanding some of the concrete information presented in the course. Other dancers preferred working through information about the body, in their bodies.

Of course, dancers must find a way to integrate this experiential work within their dancing in order to understand how the sensation they experience matches scientific information about the body and their beliefs about their (own) bodies dancing. The experiential work should help the dancers understand what the movement should be; it

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<sup>50</sup> Examples of this process are abundant in dance training. Building on the work of Lulu Sweigard and Barbara Clark, contemporary dancers and scientists Irene Dowd and Eric Franklin have combined the scientific foundations of the body into imagery and action plans for enhanced performance.

should also help them understand their individual capacities and limitations. In this research, this understanding varied by dancer, yielding modes of embodied reflection as diverse as the different dancers and their various experiences. Miche, for example, discussed during a follow-up interview:

In a leg swing, if I felt grounded and I had free movement that didn't affect the groundedness, [then] I was able to achieve both of those at the same time. Knowing that I am not defying gravity with the supporting leg, but I have control, [and] the swinging leg, it is not muscular – once I get going it is the mechanics of how my body is built that lets it happen. If I were to interfere with it, I am using more energy than I need for it. If I concentrate on the stability, my leg will automatically swing back and forth. (Follow-up Interview, 10/23/05)

And from Janelle, who felt that this information most clearly related to performance:

For me, when I am really honing in on something or expressing or connecting with something, I get the feeling that every single part of my body – everything – every muscle or shape, every feeling of tension, anything, the whole body becomes a part of it and every single piece is important. Like my entire body is [contributing] to one idea. I feel that it is very performative. (Follow-up Interview, 10/24/05)

The dancers in the current study were able to work through the details of understanding how their bodies moved, or what Miche called “the mechanics of how my body is built,” and use this information as they progressed to performance. This process involved the embodiment of the information, or experience, provided to the dancers. And while embodiment is completely unique to each dancer, all dancers develop a physical understanding of concepts. Therefore, I will now turn to the literature to illustrate how this knowing develops from dancers' interactions with their bodies and the environments in which they are dancing.

## Developing a Framework for Theorizing

A theoretical perspective will situate the four constructs presented in the previous section in a larger context. Once established, this theoretical perspective acts as a lens for theorizing about the data presented in the previous chapters to offer an explanation about how dancers come to know in their bodies.

I begin this discussion by developing what Deleuze and Guattari have called the “plane of immanence” (1994, p. 40), the “internal conditions” that shape our thinking or detail how we create a world of understanding. Drawing from psychology, cognitive science and philosophy, I will use the literature to illustrate 1) ecological affordances, which look at our interaction with the world; 2) recent work in embodied cognition, a branch of cognitive science and dynamic systems analysis that addresses how the body shapes the mind; and 3) selected writings of philosophers Maurice Merleau-Ponty, Maxine Sheets-Johnstone and Mark Johnson, philosophers who examine embodiment, the physical essence of experience located in the body and in our movement in the world.

I will draw aspects of ecologic affordance, embodied cognition, and phenomenology/embodiment together, focused by the elements of intention and perception. I will synthesize this information in a concept called *enaction*, an actor’s dynamic interaction in the world. From this interaction, *Bodies-in-the-World* emerges as a milieu, or plane of immanence, from which concepts are transformed into theory.

The following figure illustrates the notion of milieu, or plane of immanence. The figure provides a visual representation; it should be interpreted both literally (as in developing a landscape) and metaphorically (as in creating a world).

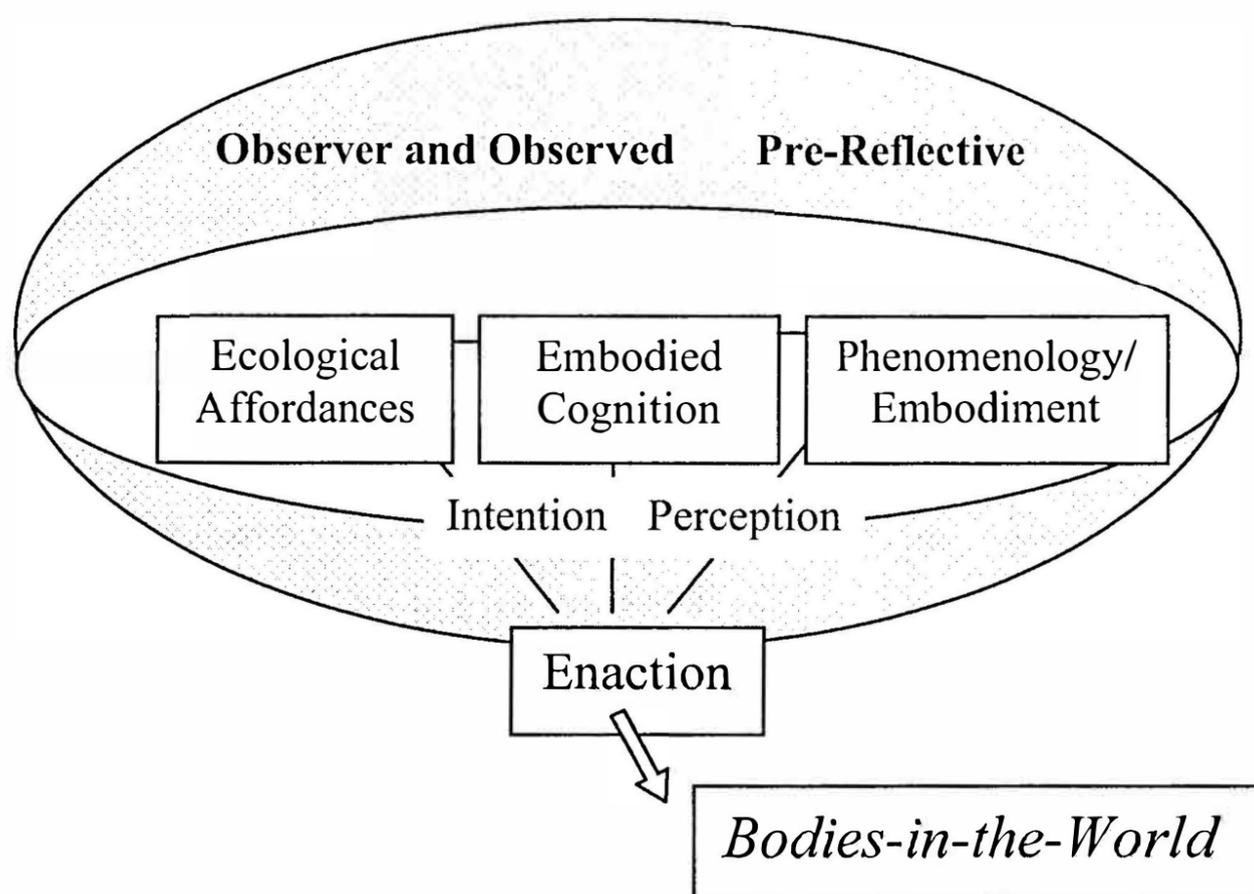


Figure 3: Developing a Plane of Immanence.

### *Ecological Affordances*

J.J. Gibson, a psychologist working in the 1950's and 1960's, rejected the prevailing paradigm of behaviorism<sup>51</sup> and proposed the idea of *affordance*. According to Gibson, an affordance is an opportunity for action in the environment that is detected by an actor as he or she negotiates the world.<sup>52</sup> For example, the horizontal surface of a chair "affords" sitting and handles "afford" grasping. Gibson concluded that these possibilities for action are based on visual information we get from the environment and are therefore the result of perception.

<sup>51</sup> Developed by B.F. Skinner, behaviorism stated that we learn by making and responding to representations in a stimulus-response cycle (Greeno, 1994).

<sup>52</sup> In this initial discussion, I will use the term actor to identify human interaction in the world that is neither gender specific nor reduces the body to being a disembodied agent, but one who has full volitional capacity.

In terms of affordances, an organism looks at “invariance detection” —or sameness in the environment—which shapes perception and directs action in the environment, relative to the “physical properties of the environment, including surfaces, places, objects, events and even changes in the environment as part of the opportunities or possibilities for behavior or affordances” (Turvey & Shaw, 1999a, p. 96). To paraphrase, our being in the world is shaped by our *interactions* with the world and our perceptions of that world.

While Gibson’s model gives primacy to vision, others have extended his ideas to include all of the senses. Varela, Thompson and Rosch (1991) offer a re-conceptualization of Gibson’s theory to describe how we couple with the environment through our “sensori-motor patterns that enact perception” (p. 204). Kelso (1995) adds that affordances are not mediated by “inference, memory or representation, but are grounded on the invariant properties of optic, haptic, acoustic structure that are relevant to an organism’s action capabilities” (p. 189). In sum, an affordance describes a symbiosis between an actor and her environment – a physical interaction with the environment.

However, rather than assuming that only the actor acts in the environment, Gibson noted that what the actor perceives in the environment is transactional: affordances point both ways, toward both the observer and the environment. Gibson concludes, “The knower and the known are not separable components, they are not definable independently of each ... knowing cannot be isolated from these components” (Quoted in Turvey & Shaw, 1999b, p. 100). Greeno describes this relationship as “interactional,”

emphasizing the actor-situation interaction (1994, p. 341). In short, our way of understanding the world is determined by our beliefs and expectations, which in turn are shaped by our purposes in the environment or in the world.

Ecological affordances situate the actor in a world in which the actor's interactions with the world form the basis of his or her knowing. Clark (1997) further clarifies Gibson's theories noting, "The environment [is] such a complex of possibilities, we create inner states that simultaneously describe partial aspects of the world and prescribe possible actions and interventions" (p. 50). With intention, the actor is an active part of the environment. In an ecological perspective, an actor shapes the world through her actions and interactions within it.

Gibson also considered action in the environment as an intentional process. In 1982, he summarized his theory of intentionality when he observed, "At the ecological scale of perception, what a thing is and what it means are not separate, the former being physical and the latter mental, as we are accustomed to believe" (Quoted in Turvey & Shaw, 1999b, p. 108).

The current study illustrated that the dancers' actions were shaped by their interactions both within a dance environment and in their own physical environment (in their bodies). In short, dancers as *Bodies-in-the-World* engage in an affordance with the environment, specifically in a dance environment. In addition, the dancers' perceptions and actions were shaped by required physical interactions with the different environments. These interactions are more fully described by embodied cognition.

## *Embodied Cognition*

While Gibson saw actions as intentional processes, embodied cognition<sup>53</sup> builds upon Gibson's affordances, focusing on the role of the body and the environment in the development of cognitive processes. And, while cognitive science views intentionality as "functional behavior" (Kelso, 1995), embodied cognition theory contends that that cognitive processes develop when a "tightly coupled system emerges from real time, goal directed interactions between organisms and their environments" (Cowart, 2003, p. 1). For example, Esther Thelen's research with infants demonstrates how behaviors develop through time. Thelen (2001) writes:

To say that cognition is embodied means 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 capacities that are inseparably linked and that together form the matrix within which memory, emotion, language, and all other aspects of life are meshed. (p. xx)

Thus, our intentions not only shape our actions and interactions in the world, they shape our knowledge, understanding and emotional responses to being in the world. The dancers in this study were balancing different goal-directed behaviors, learning dance vocabulary and matching aesthetic requirements, while at the same time integrating anatomic and somatic information with their dancing. Many things shape a dancer's

<sup>53</sup> Primarily in reaction to classical cognitive theories, proponents of embodied cognition take as their theoretical starting point a "body that requires a mind to make it function" (Wilson, p. 625). Contributors to embodied cognition come from developmental psychology, artificial intelligence, linguistics, phenomenology and philosophy of the mind. Where psychology, sociology and philosophy look at how the body developed as a site for knowing through an ability to interact with and learn from the environment, embodied cognition uses research in neurophysiology to look at how the body shapes the mind.

intention, but goal directed behaviors in dance, such as learning a particular movement, or preparing for performance, lead to very specific knowledge for the dancer.

Both Kelso (1995) and Clark (1997) focus on intention, or the complementary internal representations we employ in the complex social and ecological settings in which we must act. As Kelso states:

The brain did not evolve merely to register representations of the world; rather it evolved for adaptive actions and behaviors... it is the entire system of muscles, joints, and proprioceptive and kinesthetic functions and appropriate parts of the brain that evolve and function together in a unitary way. (p. 268)

Furthermore, Kelso and Clark have demonstrated that knowing “emerges out of multiple and varied interactions between individuals and a complexly structured environment” (Clark, 1997, p. 78), placing the body, the mind, and the environment in one dynamic system. Rather than merely reacting *to* an environment, actors develop knowledge through interactions *with* their environments. Interacting in the world, dancers understand the affordance their bodies have with the world: dancers make meaning, and develop knowing through interactions with their bodies.

Anderson (2003) also discusses embodied cognition from physiological and practical viewpoints. He notes, “Embodied cognition can be explained by looking at how our perceptual and motor systems play a foundational role in concept definition and rational inference.” In terms of practical activity, Anderson continues, “We position ourselves in [particular] ways to....solve problems” (p. 107). Citing the necessity to find cooperation between our internal representations and “repeated environmental

interactions” (p. 108), Anderson notes, our “bodily activity can have epistemic meaning” (p. 109). Anderson (2003) concludes,

Embodied cognition exploits repeated interaction with the environment by creating structures which advance and simplify cognitive tasks – these are physically grounded and oriented to the needs of the specific agent. (p. 126)

In addition to interacting with our external surroundings, Anderson also discusses how our bodies enter into an affordance with our internal environment. This relationship is also described by Damasio, who suggested that the chemical states in the body and mind create the biological scaffolding for cognition and emotion. As Damasio (2006) notes, “an understanding of the development of internal representations in the body is given as a continuous interaction that unfolds through time, throughout mental spaces and body states alike” (p. 17).

While early research in cognition was predicated on a linear assignment of neurons to actions, or locations in the brain linking to cognitive performance, current research in neurophysiology has revealed a global mapping of perception and action in the brain.<sup>54</sup> Moving beyond a linear or topographical orientation of actions and representations in the brain to a more global distribution of these events in our consciousness redefines how we think about intention and perception. We come to know our environments through intention and perception; yet our environment also includes interactions with others. We learn by observing actions in others, and in fact, the areas of the brain that are stimulated when watching someone perform an action correspond to

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<sup>54</sup> See Damasio 1994, 1999 and 2006.

those that are stimulated for movement and perception. At the same time, “regions that correspond to our abilities to understand someone else’s feelings, understand intention and use language [are stimulated]” (Dobbs, 2006, p. 24). In other words we learn through our interactions with others; this learning process includes the simultaneous representation of physical as well as emotional aspects of the interaction.

While the dancers in this study primarily described their experiences using visual metaphors, understanding how experience is distributed throughout the brain and nervous system sheds new light on perceived dichotomies between seeing and feeling. In fact, current research on mirror neurons integrates seeing and feeling, and therefore offers a more complex way of understanding the efficacy of learning by observation. Dancers learn by watching, by patterning, but the net effect of the experience is that the appropriate motor patterns are being established at the same time qualitative aspects of movement are established.

Finally, embodied cognition asserts that, “the way in which we are embodied not only constrains the way we can interact with the world, but our particular form of embodiment also partly determines the way the world appears to us” (Cowart, p. 10). For example, Lakoff, a linguist, and Johnson, a philosopher, propose that we characterize abstract concepts in our worlds according to our functional understanding of the world. To illustrate, understanding the metaphor of ‘grasping an idea’ stems from a “bodily experience of grasping a physical object” (Lakoff and Johnson, 1999). Anderson (2003) describes this understanding as a kind of reasoning, “a sense of how concepts connect

and flow ... which has its origin in, and retains the structure of, our bodily coping with space” (p.105).

As an aspect of *Bodies-in-the-World*, embodied cognition first reveals that a dancer develops knowledge or knowing through interaction. Particular experiences shape each individual’s relationship with the world, which in turn, shapes his or her understanding of the world. This representation is global and involves all of the senses, as well as physical, emotional, and intellectual elements in a simultaneous mapping and response. Embodied cognition also explains the dynamic interactions that develop in our understanding of the world and how our understanding of the world develops from these interactions.

The dancers in this study engaged in a dynamic interaction with their bodies, and through their bodies, with the world. This interaction shaped their perceptions and actions. And yet, the dancers were asked to find or make meaning from this experience. Therefore an understanding of the dancers’ lived experiences is necessary, so we now turn to phenomenology and embodiment.

### *Phenomenology/Embodiment*

According to Angles (1992), phenomenology is a “descriptive, introspective analysis of all forms of consciousness and immediate experiences” (p. 226). Looking at the subjective “inner life... phenomenology looks at what the object [of perception] is to the perceiver” (Priest, 2003, p. 5). For Merleau-Ponty, perception is key. He writes:

Perception is the original text... When we come back to the phenomena, we find, as a basic layer of experience, a whole already pregnant with an irreducible meaning: not sensations with gaps between them ...but in

spontaneous accord with the intentions of the moment. (1962/2003, pgs. 24- 25)

From Merleau-Ponty's perspective, we create a world through our intentional actions. Merleau Ponty defines intention both as how we access worldly possibilities, and as an arc, a feedback loop between the learner and the perceptual world "which brings about the unity of the sense, of intelligence of sensibility and motility" (1962/2003, p.157). In addition, he writes:

All my knowledge of the world is gained from my particular point of view or from some experience of the world. I am the absolute source. I aim at, and perceive a world... the world is not what I think but what I live through. (1962/2003 p. IX, XVIII)

Embodiment is central to Merleau-Ponty's understanding of phenomenology. Arguing that embodiment requires perception based in behavior, in looking, listening, and touching, he asserts that this interaction is the basis of all of our experience. Therefore, our bodies are "nothing less than characteristic of being in the world" (Merleau-Ponty Quoted in O'Laughlin, 2006, p.14).

For Merleau-Ponty, meaning does not come from our "constituting consciousness" but through our bodies. He defines the body as a mediator of the world and "our anchor in the world" (1962/2003, p. 144). Merleau-Ponty notes that it is never our objective bodies we move, but our phenomenal ones, stating that our bodies allow us to respond and act upon the world. The body serves as a referent or clarifying mechanism for objects, particularly through touch or movement. Therefore, the body is "the medium for having a world" (p. 167). Finally Merleau-Ponty asserts that perception

of the world and the perception of one's own body are in fact "of the same act"

(1962/2003, p. 205):

The union of soul and body is not an amalgamation between two mutually external terms, subject and object, brought up by arbitrary decree. It is enacted at every instant in the movement of existence. (1962/2003, p. 88-89)

Merleau-Ponty ascribes the way learning develops to an interaction with the phenomenal body in the world in which it lives. While Merleau-Ponty's language is often ambiguous, his ideas have provided a strong phenomenological foundation for researchers in embodied cognition, particularly as they stress the importance of the subjective experience.

Maxine Sheets-Johnstone, a contemporary philosopher, while critical of Merleau-Ponty, nevertheless expanded his discussion of embodiment and embodied knowledge. In *The Primacy of Movement*, Sheets-Johnstone writes that "movement is the originating ground of our sense-makings; in phenomenological terms, the originating ground of transcendental subjectivity" (1999, p. 161). Sheets-Johnstone notes that we came into the world moving, and this animation "is the very bedrock of coming to know the world" (p. 161). Sheets-Johnstone outlines a corporeal apprenticeship, "learning from our bodies in an ongoing process of kinetic action (bending, turning, lifting, etc.) and qualitative detail (slowness, forcefulness, etc.)" (p. 225). Our fundamental knowledge of the world, she continues, is derived from these "kinetic corporeal commonalities" (p. 226).

This dynamic phenomenon—interaction with the world—results in the "development of a phenomenological insight that we are fundamentally bonded to the

world through movement” (p. 270). Further detailing this bodily-kinetic experience Sheets-Johnstone writes, “Beginning with both felt and perceptual experiences of our own bodies...we understand how we do what we do, learning from our bodies what we have yet to do” (2005, p. 219). Here Sheets-Johnstone is talking about embodiment.

The term embodiment is used in the literature in many different ways. Nunez, Edwards, and Matos (1999) describe the primary types of embodiment, which include 1) phenomenological aspects of human bodily experience, primarily based on the work of Merleau-Ponty; 2) the unconscious aspects of bodily experience that underlie cognitive and linguistic expression, based on the work of Lakoff and Johnson; 3) the organization of bodily actions under a dynamic systems perspective, following Thelen and Smith; 4) a “biological-structural coexistence between organisms and the mediums within which they exist, based on the work of Maturana and Varela” (p. 49), and looking at the body both as a lived, experiential structure and the body as the context of milieu of cognitive mechanisms, based on the work of Varela, Thompson and Rosch. In summary, Nunez (1999) writes:

Embodiment advocates an intimate relationship between cognition, mind and living bodily experience in the world... wherein the knower and the known are co-determined as are the learner and what is learned and cognition emphasizes the primacy of the organization of the living and the resulting body experience it sustains. (1999, p. 49)

Embodiment is presented as our “being in the world.” This being is shaped in part by the many different environments in which we work, live, and interact, and our orientation to them.

As an aspect of being in the world, embodiment emphasizes the relationship our bodies have in the world and how reasoning and meaning develop from this interaction. Building upon this relationship, philosopher Mark Johnson (1987) proposes that our reality is shaped by the patterns of our bodily movement. Discussing this relationship relative to image schemata (recurring dynamic patterns of our perceptual interactions), Johnson argues that we develop coherence from our physical experience. Specifically, each individual's reality develops from patterns of bodily movement (spatial and temporal) and the ways in which they interact with objects.<sup>55</sup> Therefore, our understanding of the world is shaped by the interaction of our bodies with the world. In other words, for Johnson, our embodiment not only allows us to make sense of our abstract perceptions of the world, but embodiment is also the basis of how we reason. Johnson argues that the link between embodiment and mental functions occurs at the level of the cognitive unconscious; again, making sense of the world is a bodily activity. Finally, Johnson (2006) writes that no account of the body can exclude a discussion of affordances with the environment, "physical settings, cultural artifacts, institutions, rituals and shared practices, that give the body its medium for action and determine its meaning for members of the culture" (p. 53).

Phenomenology and embodiment explain the actors' multi-sensorial interactions with the world. What Sheets-Johnstone (1999) has called a spatio-temporal animation

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<sup>55</sup> For example, the schema of verticality orients the physical body in space relative to "up" and "down." Based on this physical orientation "up-ness" might be associated with success, pleasure or growth, and "down-ness" with death, failure or despair.

provides the basis for an actor's orientation in the world and serves as the basis for reasoning and knowing. More importantly it comprises the subjective experience of the actor, which is brought to the forefront in this aspect of *Bodies-in-the-World*. Finally, interaction with the world, and experience that results from being in the world, are described and framed by intention and perception.

### *Intention and Perception*

In its simplest iteration, intention is what I decide to do. As a dancer, I intend to move in a specific way. In my intention, I factor in many aspects of movement: timing, spatial factors, familiarity and confidence. In other words, intention shapes dancing, intention is refashioned in specific movement, and intention is the unity of our senses as an aspect of being in the world. Rounding out this simple definition, ecological affordance tells us that our possibilities for action shape our worlds; embodied cognition informs us that our functional behavior is goal directed and that we learn through interactions; and phenomenology reveals that intention is the unity of sense, intelligence, and sensibility – our being in the world. I observed this interaction in the current study in the dancers' responses and actions.

Augmenting intention, perception involves experiential exploration of movement in the dancers' bodies, where the dancers are actively interacting with and acknowledging their bodies. Thus, experiential exploration helps a dancer identify her own sense of movement and has the potential to enhance her understanding of her physical capacities. This definition of perception, grounded in the findings of the study, resonates with definitions of perception in the literature. Ecologic affordance describes perception as an

interactional knowing about, embodied cognition theorizes that development of concepts emerges indirectly through perception, and phenomenology acknowledges the layer of experience constituted by our interaction in, and articulation with, the world. The dancers' perceptions, although individually unique, are common experiences in which they are engaged with their dancing and aware of their dancing.

Intention and perception are recursively woven through the dancers' processes for coming to know in their bodies, the constructs developed from the data in the study, and the theoretical perspective of *Bodies-in-the-World*, established from the literature. Framed by intention and perception, knowing and knowledge develop from experience, integration, and embodied reflection. Situating experience, integration and embodied reflection in a larger context, ecological affordance, embodied cognition, and phenomenology, integrated by intention and perception, develop the groundwork to explain how dancers, as *Bodies-in-the-World*, develop knowing in their bodies. All of these concepts are incorporated within the term *enaction*.

#### *Enaction: Bodies-Acting-in-the-World*

Combining ideas from ecological affordances, embodied cognition and phenomenology, one can conclude that we negotiate and interact with our environments, balancing reciprocity between actions and events in a constructivist adaptation. *Bodies-in-the-World* develops from a physical interaction with the environment, that implicates the actor as the knower and the known. Therefore, enaction is the internal condition or plane of immanence – our *active* involvement in the world.

An actor's understanding of the world is shaped by her interaction and experience within it. *Enaction* is a dynamic affordance that includes intentionality, perception and our capacity for finding meaning through experience, integration and embodied reflection. Enaction synthesizes physical, emotional and intellectual elements and explains how we come to develop knowing or knowledge. Enaction indicates that our relationships with the world occur as the result of our acting in the world. Key to the understanding of enaction is teasing out and exemplifying the notion of acting or taking action.

Anderson (2005) discusses the *enactive* view where "the world is seen as a continuous series of invitations to action" (p. 4). Anderson describes the adaptive integration one makes with one's environment as "a mindedness, which emerges as an adaptive integration with one's movement" (p. 12). In *Being There*, Clark notes, "we must recognize the way our actions may be continuously responsive to worldly events which are at the same time continually responsive to our actions" (p. 172). Describing this phenomenon as reciprocal causality, Clark is looking at the "kinds of internal representation and computation we employ so as to complement the complex social and ecological settings in which we must act" (p. 221). These interactions are also discussed by Gabarini and Adenzato (2004), who note that representation is linked to the "sphere of action," which allows us to recognize objects and interact with them (p. 105). This representation is a form of constructivism and is "pragmatic, deriving from the dynamic interaction of the organism with its adaptive environment" (p. 105-106).

Dancers are *Bodies-in-the-World* who enter into a particular environment or dance milieu; dancers enter into a dynamic interaction when dancing. And yet, dance is more than movement. *It is bodily knowledge with aesthetic agency.* Through experimentation, integration and embodied reflection, dancers learn to balance conflicting information, direct attention into knowing, embody concepts in their dancing, and apply information in intersections. Therefore, a dancer’s ability to develop knowledge or knowing develops from her interaction, her acting in a specific environment, and her enaction—her dynamic affordance with the environment.

#### Development of Concepts

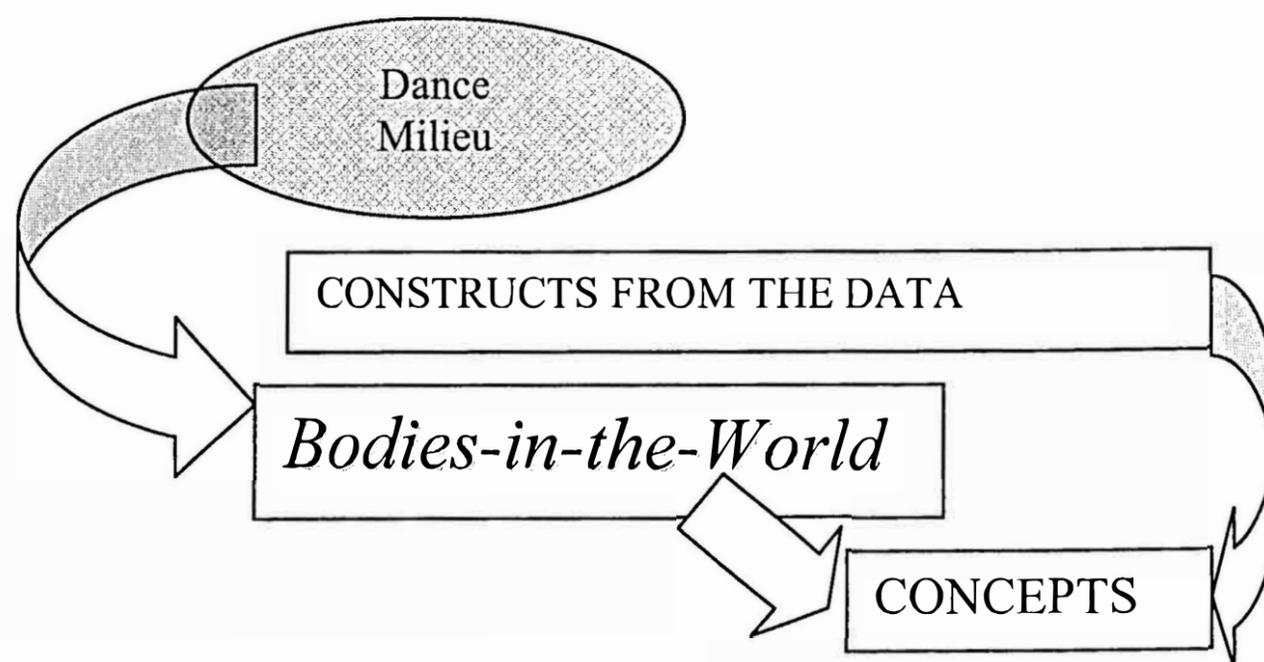


Figure 4: Development of concepts

As I bring this chapter to a close, I present four concepts, developed from the constructs presented earlier in the chapter that will lay the foundation for theorizing about knowing in the body. In this process I turn again to Deleuze and Guattari (1994), who identify concepts as a part of their treatise on philosophy. For Deleuze and Guattari,

concepts have both external and internal consistency, concepts can connect to one another, and each concept's components have an "intensive feature or a singularity about them... but [are] absolute through the condensation it carries out" (p. 20-21). I understand this to mean that each concept represents a complex series of ideas or constructs, which are distilled down to a singular idea. This one idea clearly represents the depth of information, but is necessarily simple and understandable in its presentation and communication. Finally, concepts connect to the plane of immanence as "mobile bridges, covering the plane of immanence that connects them to one another" (Deleuze & Guattari, p. 77).

The concepts that will be used to theorize about knowing in the body develop from one another, but discussion of these concepts could proceed from any starting place. One concept connects to, and develops from, any of the other concepts. As *Bodies-in-the-World* in a dance milieu, dance or dancing becomes an attractor for the dancers. This attractor yields the following concepts: 1) experience leads to knowledge, 2) knowledge is temporal, 3) knowing takes place in application and intersections, and 4) through embodiment, dance becomes dancing.

As the diagram on page 39 illustrates, dancers are *Bodies-in-the-World* who enter into a dance milieu. Through the process of experimentation, integration and embodied reflection, the dancer engages with her body and comes to know in her body. The ways in which each dancer engages with her body is unique to each. As the dancers apply this "knowing" in their dancing, the cycle repeats with new information and is recursive.

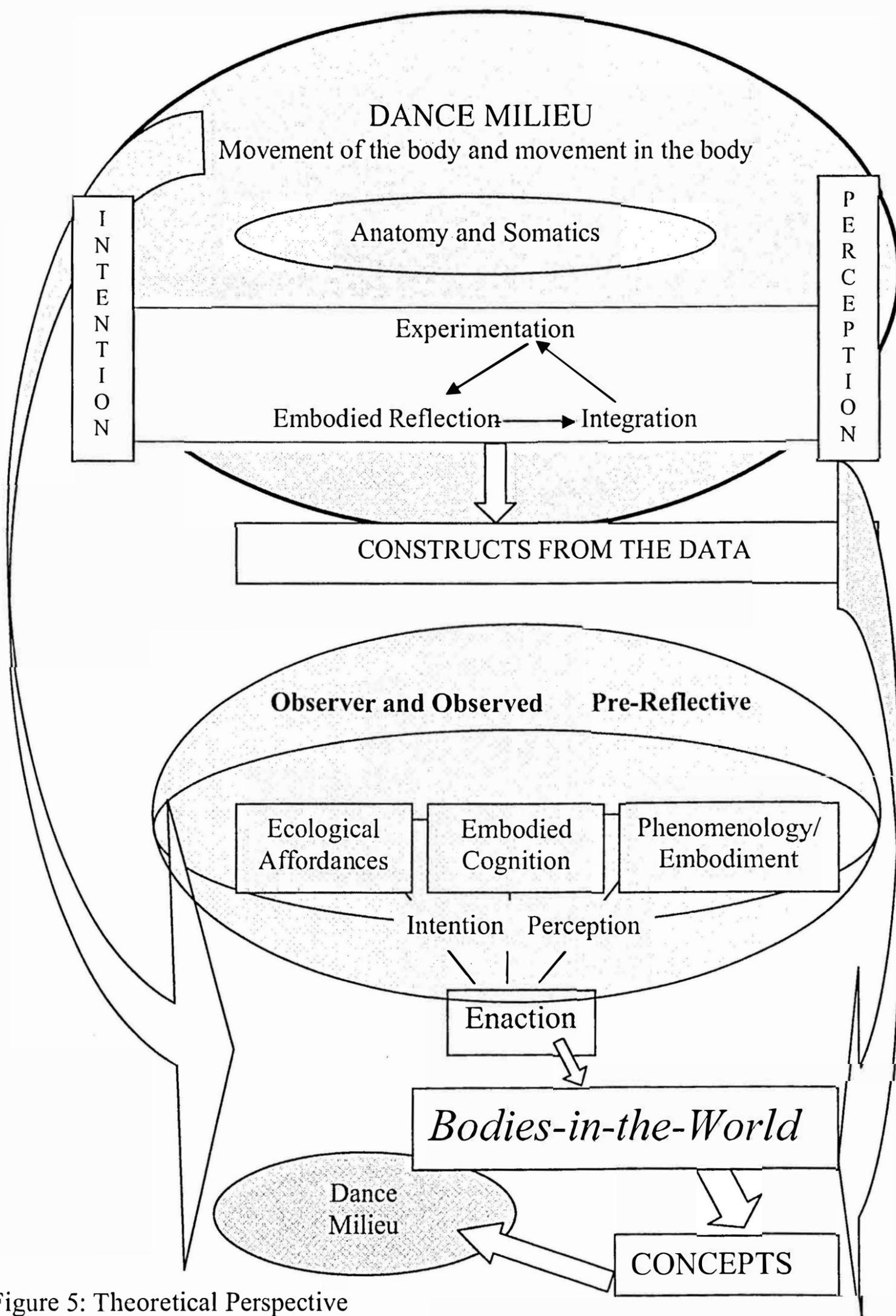


Figure 5: Theoretical Perspective

## CHAPTER VIII

### KNOWING IN THE BODY: A DANCER'S EPISTEMOLOGY

In this chapter, I theorize about how dancers develop knowledge in their bodies. In considering how *knowing in the* body develops, I will look at how meaning emerges from the dancer's active interaction with her body in the world and in a particular dance milieu. In addition, this chapter discusses how particular information and experience affects a dancer's dancing experience. *Before proceeding however I need to state explicitly that I am using the term "knowing" to include both embodied cognition and pre-reflective awareness, and the term "body" to mean both the anatomical body and the subjectively perceived body.*

In Chapter VII, I established that the world operates as an affordance for an actor's interaction in an environment. This interaction influences the actor's actions and perceptions in the environment, and ultimately the development of her reasoning and understanding – in short, she becomes a *Body-in-the-World*. To take this affordance one step further, when a dancer enters into a dance environment or milieu, the opportunity for action transcends merely being in the world. Movement affords dynamic interaction (enaction) for a *Body-in-the-World*, and dance is a specific way of moving. In addition, the milieu in which the dancer is working has very particular requirements and expectations that affect the dancer's perceptions and actions. Stated more explicitly, when a dancer enters a dance studio, she is introduced to aesthetic ideals and stylized

movement in a very specific environment. This introduction provides a particular context for knowing in the body. Therefore, movement, and dancing in particular, operates as an attractor,<sup>56</sup> or preferred behavior, for a *Body-in-the-World* in a dance milieu.

The following diagram brings forward the framing perspectives of *Bodies-in-the-World* and *enaction* from Chapter VII to situate concepts that emerged from the research and to allow me to theorize beyond *knowing in the body*, to how a dancer's epistemology emerges. The concepts that developed from the research include how experience leads to knowledge, how knowledge develops through time, how information is meaningful in application and intersections, and how dance becomes dancing. Examination of these four concepts both reveals a general trend in the development of *knowing in the body* and acknowledges that that each dancer's experience is also unique. Dancers learn about their bodies—being in their bodies—in action.

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<sup>56</sup> Defined by Kelso (1995), an attractor is a stable state wherein “almost all initial conditions converge” (p. 54). Stimuli from the same attractor basin will “retrieve the same memory” (p. 160). The codified nature of many dance forms would qualify it as an attractor.

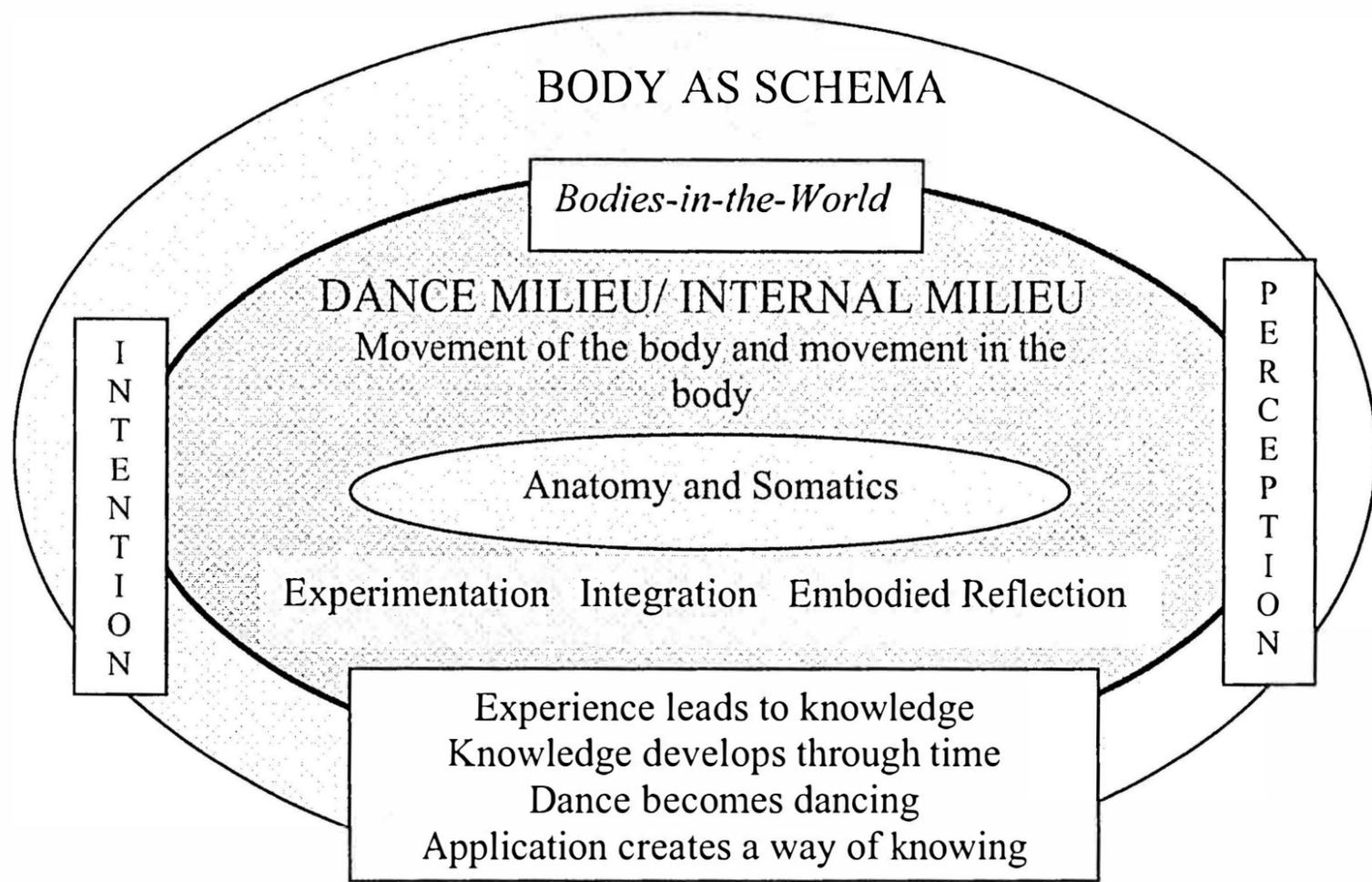


Figure 6: Body as Schema

#### Development of Concepts from Constructs

In theorizing how knowing in the body develops, I will elucidate how knowledge develops from experimentation, integration and embodied reflection. More than simple conscious reflection, this knowing is information that a dancer holds in her moving body; it is the maintenance of physical sensation and memory. When a dancer has developed a *knowing in her body*, this knowledge replaces transient attention to specific information, and through this embodiment, the dancer finds meaning in her movement. This physical knowledge or knowing emerges in intersections and develops in application. From these intersections, the dancer develops confidence and trust in her moving body, and she finds meaning in the movement her body is creating and performing.

### *Experience Develops into Knowledge*

Merleau-Ponty (1962/2003) wrote that we experience our bodies in movement—we do not have a body—we are a body. He also wrote, “The world is the horizon latent in all our experience, and our movements and actions are within this frame, therefore knowledge cannot be understood apart from the body and the world” (p. 92). Merleau-Ponty used typing to illustrate this concept – our fingers in motion know how to find the letters on a keyboard. It is knowledge of familiarity; therefore, the knowledge is in the action of our hands. For a dancer, the knowledge is in the movement of her body. Dancers do not need to think about their bodies or their actions when they are moving, because they have developed knowledge of their bodies in movement.

Dancers develop aspects of knowing in their bodies that range from specific detail to general information. For example, dancers are asked to enact spatial patterns and exact embodiments of dance vocabulary, precise actions within particular temporal requirements. At other times dancers are asked to follow their bodies or explore a particular idea within an improvisation score. Addressing these wide ranging expectations in dance, dancers must be able to move easily back and forth throughout this landscape of potential movement framed by specific technique and improvisation or exploration.

Information about a particular movement or a general exploration is experienced through the process of moving. A dancer can make a conscious intellectual and physical choice to focus on particular sensations or to integrate specific information into her dancing. When she does this, her body creates a dynamic affordance, an *enaction*, within

the dance milieu she is working in. And, as the dancer incorporates the information from this integration, experience leads to the development of knowledge.

In movement, a dynamic epistemology emerges: a dancer develops knowledge of movement, and of her body, in her body. A dancer knows what she knows because of dancing, of moving. Each dancer forms her own knowing in the body; an epistemology that is unique to the individual and is informed both by a dancer's physical interaction with the world in general, and in specific ways relative to the requirements within the world of dance. And this epistemology continues to evolve as the dancer evolves with her movement.

Therefore, *knowing in the body* requires each individual dancer to discover 1) how information from outside her body makes sense in her body, 2) how information about her body, or from her body, interfaces with her movements, and 3) how this information functions in harmony with the particular demands of the milieu. This knowing occurs when a dancer is in a dynamic relationship with her body. This dynamic relationship is a physical engagement that occurs when the dancer comes to understand both the possibilities and limits of movement, when she understands the intersection of her dancing body and the world in which she is dancing.

### *Knowledge Develops Through Time*

In a given dance context the focus for attention and intention might be a performance goal or specific information about a dance style. Attention draws a dancer to specific information; this attention establishes the neuromuscular pathways that facilitate movement. However, for the dancer, this intentional attention is short lived. By

attending to particular aspects of movement or moving, dancers shape and direct their actions. Over time, these experiences develop a “knowing how” for dancers in performance of the movement.

Given particular information a dancer will rapidly initiate a physical response to a movement cue or direction. Transcending attention and intention, a dancer no longer thinks about the movement, but allows her actions to align with the goals of the moment, the goal being a particular instance of dancing. The dancing emerges without the dancer reflecting consciously on her body or the environment, but as an aspect of experience, constituted by the dancer’s interaction in, and articulation with, the worlds in which she is dancing. Through time, and with practice, the dancer develops familiarity and ease with the movements in her body. This is facilitated not only by her conscious understanding of the movement, but from a physical understanding of her body performing the movement.

When a dancer accesses specific information about her body or the sensation of her body in movement, perhaps through integration or through embodied reflection, she can integrate and apply this specific (or general) information into her dancing. This integration is the result of a dynamic interaction of her body and the requirements of the movement. This interaction also develops a confidence for the dancer that manifests in her outward movements. This confidence allows the dancer to fulfill specific dance requirements, confirmed by her perceptions of sensation and/or her reflection upon the action in the body. *Knowing in the body* emerges for the dancer over time, through the

integration of these outside and inside sources of information and experiences into her moving intellect.

This development of knowledge over time illustrates the dynamic interaction, or *enaction*, of the dancer and the worlds she is dancing in. Once a dancer has embodied new information, whether a feeling in the body or movement executed with a particular quality, this knowledge is embedded in her movements, with her performance and her sense of self, or agency. She has integrated this knowledge into her dancing; it is not something she needs to think about further. From this active engagement in both the world in which the dancer is dancing and the world of her body, through enaction, a dancer develops knowing in the body.

#### *Applications and Intersections*

Dance language, terminology and images provide a mode of engagement for a dancer, allowing her to develop complex movement patterns from minimal information cues. During this time a dancer is also receiving information from her body. Therefore a dancer is in both an internal (in her body) and an external environment (in movement); she is moving in and with her body in a dance environment.

Through the cyclical process of experiencing, integrating and reflecting, a dancer enters into a relationship with her body that provides not only a better understanding of her body, but of her dancing and her knowledge of the world in which she is dancing. The dancer's physical body becomes integrated with her performing body in a reciprocal fashion, creating a dynamic interaction, which is based on intention and perception—acting in the world—of a dancer's body experiencing dancing. Every dancer works with

information *about* her body, *with* her body, and through this experiential approach she creates knowledge *in* her body. And while experiential information is processed differently by each individual dancer, this negotiation of both worlds allows each dancer to find intersections and applications that best suit her needs, experiences and the environments she is working in. This pairing of physical body, the felt or “sensed body,” and the aesthetic requirements for the artistic expectations in dance is described as a *physiosomatic*<sup>57</sup> *aesthetic*.

To demonstrate this physiosomatic aesthetic, three scenarios are presented below, first, a focused study and somatic exploration of anatomic information about the hip joint, second, a scenario that describes a very specific movement sequence requiring range of motion at the hip joint, and last, one that details a score for improvisation based on initiating movement from the leg in the pelvis (hip joint). These three examples are designed to illustrate some of the possible the modes of epistemic access that a dancing dancer has with her body.

In the first scenario, a dancer focuses on understanding the configuration of the ball and socket organization of the hip joint by studying and exploring pertinent anatomical information to create an epistemic framework. This study is augmented by seeing the hip joint modeled in a three-dimensional perspective or explored using a specific image, such as the femur “as a top, spinning in the acetabulum,” to offer the dancer multiple sources of information about her body. In this scenario, the dancer is

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<sup>57</sup> The term physiosomatic was suggested to me by Mary Williford-Shade in my qualifying examination questions, presented June 16, 2005.

balancing both concrete and “sensed” information about her body, in her body. She can apply this information to other situations, or simply reflect upon the experience.

Therefore, from study and exploration of this information, she develops *knowing in the body*.

In the second scenario, the dancer is performing a specific phrase of movement. This phrase begins with the dancer circling her right leg through her full range of motion in a grand rond de jambe en l’air as her body rotates, followed by a fouetté, or quick rotation of the gesture leg from back to front while the body turns to meet the leg. The dancer then brushes the gesture leg behind her to lower her body into a lunge. From the lunge, folding the back leg under her hips and performing a spiral roll over the back of the pelvis, she returns to standing on the left leg, with the right in attitude derrière position. The movement phrase is executed at a given tempo and within specific qualitative parameters.

As the dancer integrates specific information from this phrase with her body’s ability to perform the movements, a *knowing in the body* develops, and continues to evolve as the dancer evolves in her performance of the movement. This knowing encompasses the detail of the phrase, the bodily sensation of performing the phrase and the integration of the aesthetic elements (timing, dynamics, etc.) as the dancer brings the series of movements to a particular level of performance.

The third scenario describes a score for an improvisation study. In this score, titled, “Is the dog wagging the tail, or is the tail wagging the dog?” the dancer is asked to create a dialogue between the top of the leg and the pelvis. To illustrate, sometimes the

pelvis initiates the movement of the leg, and sometimes the leg is responsible for moving the pelvis. The dancer is asked to integrate additional information into the score, for example, to work within different tempos (in relation to very specific music or sound cues), to work at different levels and to decide how much the “animation” or quality of movement from the rest of the body might clarify her intent. *Knowing in the body* emerges as this dancer finds the range of possible initiations from the different body parts and integrates this knowledge into her exploration.

In each of these examples, the dancer is processing many different types of information about the body, through the body, and in the body as cognitive, aesthetic, qualitative, and temporal aspects of movement, to name just a few. In addition, the dancer may be perceiving joint motions, muscular responses, and sequential actions in the body; she might be intending to move with a particular quality or emphasis; or she might be simply reflecting on the sensations she received from her body moving in space. In each scenario, different dancers would perform the same or similar movements as individuals, based on the differing ratios of their body segment lengths and ranges of motion as each dancer brings a slightly different physical body to the movement. Therefore each dancer would experience a different physical response to the “same” movement cue or image, and thus have a different epistemic response to the experience. Additionally, in the execution of the movement, each dancer receives specific information from her body that references her physical initiation and response to the movement, but also influences and contributes to the overall artistry of her exploration or performance. Therefore, even within a specific image, movement phrase, or exploration

score, the epistemological experience would differ for each dancer. And yet, in engaging with her body, each dancer would develop a *knowing in her body*.

Furthermore, each of these scenarios offers potential for experience, integration and embodied reflection. In each of these scenarios, there are literally hundreds of things that a dancer could focus on. Some points of focus can be observed from the outside, such as leg height or freedom of hip joint motion. And yet, most of the dancer's experience is known only to her, *in her body*.

More than an outward manifestation, *knowing in the body* emerges from the dancer *being* in her body, accessing either a conscious or embodied awareness or reflection, or by simply experiencing and integrating a physical exploration. In all three of the above examples, the dancers are physically engaged in knowledge making. And once this *knowing in the body* develops, it serves the dancer in many aspects of her dancing.

Key to understanding this concept is the notion of the individual's body. Although no two bodies are exactly the same, the general structure and organization provides a general frame of reference for the dancer. In addition, dancers bring a variety of experiences to understanding their bodies, making each dancer unique, even within a collective unit such as "dancers."

At the same time, an individual's body is a reflection of all bodies, and the more a dancer knows about all bodies, the more she begins to understand about her own body. Reciprocally, the more a dancer knows about her body, the more she understands about all bodies. In a similar pairing, the more the dancer knows about her body, the more she

understands movement. And finally, the more the dancer understands movement, the more she understands her dancing body.

Other intersections include possible dynamic interactions a dancer has with different environments or specific circumstances within her dancing. These different environments in the dance world include contact improvisation or moving within a different relationship to gravity – for example, in floor work or in aerial dance. In addition, knowing in the body informs dancers in situations such as teaching or choreography. These intersections represent what Dewey calls “crystallization” wherein there is “no distinction between perceptual meanings, motor meanings or intellectual meanings” (Quoted in Kestenbaum, 1977, p. 63). These intersections reveal the two worlds in which a dancer is dancing, and in which *knowing in the body* develops.

### *Dance Becomes Dancing*

As dancers are already *Bodies-in-the-World*, a dynamic affordance integrates their bodies and the milieu in which they are dancing. Between these worlds, and within them, is the source of the dancer’s embodiment.<sup>58</sup> Dancers do not have to think about their bodies in movement; they *can* integrate sensory information from their bodies (internal environment) or engage in an embodied understanding of their bodies through movement.

Dancing requires an aesthetic perception that is only possible from an embodied understanding of the movements involved. Through movement, dancers develop a “knowing about” from which they can develop expressive artistic movement based on

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<sup>58</sup> Here I am using Nunez’s (1999) use of the term embodiment “wherein the knower and the known are co-determined as are the learner and what is learned” (p. 49).

their interaction in, and articulation with, their bodies and their dancing. Through this embodiment, literally taking concepts into the body and understanding these concepts in terms of the dancer's own body, movement surpasses the steps, the vocabulary, and the descriptive elements to become dancing. Here the dancers are creating intersections of the worlds they are dancing in, linking their physical actions with the requirements of the dancing in their doing and being.

Dancers develop dancing with their bodies: through their individual bodies, they make meaning. And while dancers can choose to simply execute movements, when they engage with their individual bodies, they begin dancing. When an understanding of a movement, a quality or a physical understanding of how the body operates is integrated into a dancer's movements—becomes embodied—the dancer transcends knowledge and develops knowing. When this information is applied in action, the dancer transcends dance and experiences dancing. The transitions from movement, through practice, to moving; from dance, through embodiment, to dancing; from knowledge, through experience, to knowing demonstrates the transcendent form of a dancing body in the world. As dance philosopher Sondra Fraleigh (1987) writes, “We dance to become acquainted with that which cannot be known by any other means ...we develop a knowledge that is experiential (bodily lived)” (p. 26).

This lived knowledge of the body, of movement and the individual dancer's dancing, becomes a unity of all of her senses, understandings, and actions: the dancer is dancing in two worlds. Therefore her body acts as a means for being in the world, for

acting in the world and for knowing in the world. In short, the dancer's body acts as a schema for her.

### Body as a Schema

As a *Body-in-the World*, the dancer is already in affordance with a dance environment, such as a dance class, rehearsal or dance performance. Her "knowing" develops from dance-specific cues, details and interactions with other dancers. She can choose to attend to the lived experience of her actions in her dancing. In this sense, the dancer is in a dynamic relationship with the world around her. But she is also interacting with an internal environment, her body, and in this relationship knowledge also develops.

A dancer interacts with her internal environment, her own body, primarily in what Merleau-Ponty calls a pre-reflective state. Although human bodies are complex systems that do not require our conscious intervention, we can temporarily alter the physiological state of our bodies through conscious thought. For example, I can slow my heart beat down simply by attending to my breath and to relaxing. Or I can decide to move my arm to a specific location. However, I only need to think about my heart, or what task I want my arm to perform; highly evolved neuromuscular and proprioceptive systems, in conjunction with established movement patterns for my body, coordinate and carry out the action for me. As an adaptive biological entity, the body has developed mechanisms for homeostasis and for auto regulation. These systems free the dancer to address more particular information from the dance milieu she is working in.

As *Bodies-in-the-World*, dancers do not have to consciously determine how to deal with gravity, calculate for acceleration or choose the correct energy system for a

long improvisation session. Dancers simply access these force-time relationships within their bodies in response to cues from the dance environment. And as dancers are asked to create very particular actions with their bodies, discrete bodily systems develop commensurately to facilitate these specific tasks. This is a prime example of a dynamic affordance a dancer has with her body, *enaction* in relation to the environment she is acting in. Although research in motor learning and performance has shown that attending to the body while dancing is problematic,<sup>59</sup> it is clear that a dancer must go through some preparatory or exploratory phase when learning movements that require negotiating specific adjustments in speed, force and direction of the movement. As a mode of attention, thinking *about* the body, is a phase that dancers and other skilled movers move through quickly. Yet many times dancers pass through this movement exploration without acknowledging the attendant sensations. Through the process of moving, of bodies moving in a dance environment, a bodily knowledge develops as the result of this physical interaction of the dancer's body in the world. A dancer does not need to think about her body when dancing because the moving body is already in affordance with the world that supports her *knowing in the body*. The dancer's body provides both a structure and a reference for understanding the physical body, understanding how the body moves in the world and how the body moves in dance. This information is accessed not by thinking about the body, but from embodiment, from being in a moving body.

Johnson (1987, 1999 and 2006) describes a "schema" that acts as a pattern or template to explain how we develop knowing through our bodily interactions with the

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<sup>59</sup> See Enghauser (1999).

world. A schema is based in our sensorimotor experiences, the ways our bodies act and respond in the world. Johnson argues that these physical interactions with the world (e.g. grasping, containing, orienting in the vertical plane), explain the development of abstract concepts and reasoning in both literal and metaphoric interpretations. As Johnson (1987) writes, “a schema is a recurring dynamic pattern of our perceptual interactions and motor programs that give coherence and structure to our experience” (p. xiv). Therefore, a schema is an embodied structure that organizes the world as it becomes known to us in our interactions with it.<sup>60</sup>

Following Johnson’s theory, I propose that the body operates as a schema that is integral for understanding how *knowing in the body* develops. A dancer uses her body in movement, but until she has developed a sense for her own body in dance, she will only be executing the steps. This is particularly true in relation to the scenario given earlier for a specific dance phrase. Aligning an understanding of the body with the physical affordance of the experience of moving the body, specifically the dancer’s own body, “understanding” the body is actualized when the dancer knows *in* her body. For example, once a dancer has experienced her weight, her own range of motion, and her individual pattern for movement, this embodied knowledge enhances her sense of spatiality, timing and dynamics in movement. Through this process the dancer is “making connections across domains of [her] experience” (Johnson, 1987, p. 103). Through this process of

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<sup>60</sup> For example, the schema of *Source-Path-Goal*, links spatial information with mental constructs, resulting in the schema of reasoning along a path that leads to the attainment of the goal. This linear configuration explains how reasoning progresses from beginning to end. *Source-Path-Goal* operates on both a physical and perceptual level, “becoming the basis for our experience in the world” (Johnson, 1999, p. 83).

making connections, the body operates as a schema for the dancer to understand her own body in movement.

However, the schema paradigm also reflects the ambiguity and complexity in the concept “body.” The word body has many different meanings. Body implies structure and substance or indicates the main or central part. The word is used to describe containment and embodiment – an entity or collective. Body also refers to shape. And, a body is both static and dynamic. The body is both present and performative, absent and illusive. The body is a metaphor for community, for narrative and for vitality. *That we know and come to know in our bodies means different things both in general terms and relative to each individual dancer.* The body is collective knowledge and physical capacity; it is both the most tangible, and the most fleeting aspect of a dancer’s performance.

The concept of body as a schema is both literal and metaphorical. For example, when a dancer uses the schema of body, it perhaps indicates more than simple information about muscles and bones, but represents a way of embodying ideas and expressing narrative. Indeed, the body as schema creates a means by which dancers come to know in their bodies, and the body in action is a dancer’s episteme or knowing/knowledge framework.

### Is Study of the Body Required?

Theorizing about how *knowing in the body* develops reveals how the introduction and integration of particular information, such as anatomy and somatic experience, can affect a dancer’s dancing. The current research led me to understand that as *Bodies-in-*

*the-World*, the dancers developed a *knowing in the body* by studying systems of the body in application to their learning, teaching and performing in a dance environment. This specific information about the body was identified and then explored in movement: dancers worked with both concrete images and improvisation or movement exploration to create awareness and embodiment of the particular referent. These explorations provided opportunities for *physiosomatic embodiment*, the integration of concrete information about the body through the process of experimentation.

In this experiential work, dancers integrated anatomic and somatic information into their dancing and performance, which contributed to the development of *knowing in the body*. This anatomic and somatic information or the “known” was transient; in fact, many of the dancers reported that they had forgotten more than they remembered when they were no longer in the courses used in the study. However, as the follow-up discussions with the dancers revealed, the interaction between their internal and external environments caused a change in their dancing. These intersections may have developed from studying the body using anatomic and somatic information or by seeing modeled information of a complex movement (such as grand rond de jambe en l’air). The knowledge that developed from the experience, integration and embodied reflection of the anatomic and somatic information illustrates how the body schema works for a dancer, but is not the only way dancers come to know in their bodies. Intentional study of the body, such as study of anatomy and somatic exploration is not required for developing *knowing in the body*, but this study can clarify and enhance a dancer’s understanding of her body in movement.

In fact, dancers develop *knowing in the body* in many different ways. One way that dancers come to know in their bodies is by working with a teacher or choreographer who has developed a clear understanding of her own body. In this case, information is transmitted qualitatively or is facilitated through the activation of mirror neurons.<sup>61</sup>

Another way *knowing in the body* develops is simply by spending time in the body. Highly skilled dancers may never study the body, but it is evident that there comes a time when each understands his or her own body. However, implicit in all of these examples is a schematic resonance with the body. Dance is movement of the body, dance celebrates the body, and dance has developed from dancers moving expressively in their bodies. In other words, the body affords, or creates a milieu for, dancing.

And what does *knowing in the body* look like? For the dancer, it is an enhanced awareness of her body in movement that is manifested through sensation, weight, quality or expression. Therefore, *knowing in the body* develops from the perception, integration, and reflection of sensation based on a dancer's interaction with the worlds in which she is moving. Specific anatomic and somatic information "affords" knowledge about the body, through the body, and *knowing in the body* develops through dancing.

Parviainen (2002) states that physical knowledge forms a source for dance knowledge. Focusing on the existence of bodily knowledge, a way of knowing in terms of bodily movements, Parviainen asserts that the living body acquires knowledge in the process of doing, and that this experience is "sedimented into the body schema" (p. 20).

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<sup>61</sup> See Dobbs, 2006.

As Parviainen asserts, and the current study supports, dancing knowledge is grounded in the body. It is balanced through the integration and reciprocity of a dancer's body in the world of dance and experienced in the world of the dancer's body. It is a composite of movement as internal function and sensation and external application (performance, emotion, artistry or performance). Dancing creates a knowing about the body, in the body. Dancers "think in movement" and respond to the dancing environment. Dancers' bodies are in the world, and yet their epistemological foundations are formed through enaction, through dynamic embodiment and action.

As *Bodies-in-the-World*, dancers can explore more deeply their understandings of their bodies through research, exploration and integration of information about all bodies (intention and perception). In the current research the study of anatomy and somatics contributed to the dancers epistemology; the information acquired through this study become knowledge in the body. However, this exploration is not a prerequisite for dancing; it simply can provide an opportunity for an individual affordance between a dancer and her dancing.

In the end, our bodies provide us with ways of knowing. As the current study demonstrates, when dancers integrate knowledge of the body with knowledge of their dancing, this knowledge acts as an *attractor* that leads to the development of an individual physical knowledge – a knowing in the body. Each dancer has an individual epistemology that develops from her experiences and her expectations. This epistemology, *knowing in the body*, develops in action and is influenced by many different sources.

Understanding how dancers develop *knowing in the body* presents a new paradigm for pedagogy. The next chapter presents an application for *knowing in the body* as a foundation for a pedagogical approach. Finally, this pedagogical approach centers on the “re-introduction” of the body as the center of dance.

## CHAPTER IX

### THE BODY AT THE CENTER OF DANCE

What if dance schools focused on “getting the movement” rather than doing it? What if the whole year focused on jumping rather than learning the recital routine – how would this change our levels of technique?  
(Amye, Journal Entry, Experiential Anatomy, 04/22/05)

In this dissertation, a series of separate, but interrelated, case studies illuminated a particular approach to teaching, and learning, about the body. In the pedagogical approach and research design for each case study, the participants explored factual information about the body through movement of the body. The dancers’ observations about the structure and function of the body were balanced by tactile exploration, movement exploration and application of the anatomic or somatic information in different contexts, both immediately, and through other dance experiences outside the study. Each case study revealed the various ways dancers came to understand the body, but more particularly, how each dancer came to understand her own body.

This dissertation also explored the dancers’ experiences in the different worlds within which they were working. As a dancer enters into a world of dance, she must balance the expectations of the dance world with an understanding of the world of her interior landscape – her own body. Through the process of being in her body, a dancer comes to know her body; through movement, a dancer develops an understanding of her body in motion.

Finally, this study looked at the interface between pedagogy and research as a perspective for understanding how a dancer develops *knowing in the body*. This final chapter places the findings of my research in the larger context of pedagogical application that places the body (back) at the center of dance.

In Chapters VII and VIII, I developed a theoretical perspective of how knowledge develops from experimentation, integration and embodied reflection of diverse information (both physical and intellectual), information that comes to be known in dancers' bodies. Theorizing about how *knowing in the body* emerges explains how dancers develop knowledge in their bodies and how experience resonates with each dancer's dancing, revealing the dancers' interactions with the world, both within their individual bodies and within a dance milieu. Additionally, an understanding of how dancers develop *knowing in the body* sheds light on the dancers' self-understanding, and thus speaks to both their individuality and to their agency. Finally, *knowing in the body* is explained by looking at the body as a schema. As a schema, the dancer's physical body—an interactive element of being in the world—affords the dancer ways of understanding. A dancer develops understanding of her world and the world of dance from being in her body. This embodied cognition lays the foundation for a dancer's *knowing in the body*. A dancer develops knowing in the body because she is *in* her body, moving *in* the world.

Throughout the research, I observed that understanding the body results from being in the body, and while a particular context frames this information for each dancer, the end result, the development of an embodied knowledge, will be the same for all. One

dancer might begin from movement as a means of simply being *in* her body, where another might use specific movement as an inroad for experiencing detail about the structure and function of her body. In each of these approaches, information about the body is framed within the context of the body in motion. Movement is the context, curiosity is the catalyst: wanting to know, needing to know (for example as a dancer is trying to rehabilitate from, or avoid, an injury), and wanting to understand, perhaps to further artistic growth. Finally, understanding the body in motion is integral for pedagogy and choreography. While these foci can be general, as relates to the dancing body, or specific, as relates to an individual dancer's body, understanding the body—in the body—provides the physical foundation for a dancer's artistry. Thus, the body offers the dancer a context for understanding and performing movement, but when a dancer discovers the affordance of her body in movement, she also discovers expression and understands her physical capacity. And while the individual dancer's understanding can develop in many ways, this dissertation looked specifically at the presentation of anatomic information balanced with somatic, experiential exploration as a mode of access for developing *knowing in the body*.

Traditional study of anatomy and kinesiology provides dancers with models and vocabulary to begin to understand how the body functions in the world and in movement. As an educator, I place tremendous value on a traditional approach to teaching kinesiology, for I feel that study of the structures and systems of the body augments and complements a general understanding of the body. Learning the names of the muscles and bones gives clarity to the dancers' understanding of their internal landscape. And

while a deep understanding of the complexity of the body is a rigorous field of study, even cursory study of the body yields useful information for the dancer. However, this information is augmented when dancers find a means to embody this information *about* their bodies, *in* their bodies.

Irene Dowd, a neurophysiologist who works primarily with dancers, notes that anatomical information is most useful when it is used in context. Dowd balances particular detail with movement; her goal is to integrate the anatomical information with a conceptual application. For example, knowing where the scapula rotates in an extension of the arm facilitates a more efficient and expressive use of the arm. “Anatomy teaches us about the next set of possibilities. It describes what you are doing, not how you are—it is also an invitation to act” (Class notes, August 2006).<sup>62</sup> An experiential approach to understanding the body develops an increased awareness that is both internal and external; it is physical and spatial in relation to a dancer being “in her body” and in motion. Studying and experiencing information about the body, dancers develop different epistemological frameworks for understanding their bodies in motion. The application of this understanding is the integration of this information with their understanding of movement and their dancing.

Whether dancers are consciously aware of attending to the body or not, they are informed by their bodies in movement. However, dancers do not need to think about their bodies unless they are paying explicit attention to some particular aspect of the

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<sup>62</sup> This class was part of a workshop: The Exquisite Versatility of Our Upper Body, held at the University of Utah., August 14-16, 2006.

movement. In fact, dancers often describe movements they perform easily and which they no longer have to think about, as embodied. These embodied actions are often classified as belonging to “muscle memory.” I argue that the term muscle could be interchanged here with “body.” Body memory signals dancers when a movement is “right” in their bodies; it enables them to perform sequences of actions that no longer require their conscious acknowledgement. In these moments, the dancers are not reflecting on their bodies, but reflecting *in* their moving bodies. This embodied reflection is not necessarily something a dancer has developed verbal vocabulary to express, nor is it something that needs to be expressed. Rather than an acknowledgement of a specific muscle or joint action, embodied reflection is a general sensation. This sensation ranges from ease, euphoria, release of endorphins, physical confidence, a sense of fulfilled capacity, and physical satisfaction ... to fatigue, soreness and injury. This embodied reflection is confirmed in the qualitative aspects of movement; aesthetically appropriate coordination of the spatial, temporal and dynamic qualities of the movement. In these instances of *knowing in the body*, the dancer has merged the two worlds in which she is dancing.

While the body affords moving between two worlds—the world of the body and the world of dance—dancing operates as an attractor, bringing the dancer and the world she is moving in into synchronous function. As pragmatist philosopher Richard Shusterman (2006) writes,

Because the body is thoroughly affected by the world's objects and energies, it incorporates their regularities and thus can grasp them in a direct, practical way without needing to engage in reflective thought. (p. 5)

Thus, the body in motion is the source of a dancer's *knowing*.

Therefore, based on the findings from the research in the current study, I advocate for the “re-introduction of the body” to the core of the world of dance. In teaching movement, in choreographing movement, or in exploring movement, starting from the body—a body to be understood and celebrated, a body to be inhabited, a body as medium—does not deny any purpose or feature of dance. In coming to understand the body, and in particular a dancer's own body, a sense of agency is established; the dancer develops physical connections to the movements, the music, and the dance environment. This integration of information about the body, experienced in the body, is an integral part of becoming a dancer. Re-envisioning the teaching of dance from a bodily centered perspective honors the knowledge that emerges from a dancer as a body in motion.

#### Applications to Pedagogy

As a population, dancers engage in repeated rehearsals or classes working within specific techniques. The nature of dance training is to establish a movement vocabulary that is commonly understood and a commensurate work ethic to develop this unified understanding of movement. Part of a dancer's body knowledge comes from this interface with technique, when her body can match and reproduce spatial and temporal cues that comprise her repertoire of movements. As dancers develop familiarity and ease with the repertoire, they also discover what their individual bodies can do. Over time each individual dancer explores and experiences how her body responds to, or fulfills, the complex and aesthetic tasks required of her. And while each dancer comes to know

about her body in this process, I propose that additional information about the body makes the dancer's learning, and dancing, more efficacious.

Dance is many things, it is artistic, dramatic, and evocative; it is elusive, challenging, and enjoyable for the dancer. But above all, dance is about movement of the body. Dance celebrates the body and has developed from dancers moving expressively in their bodies. In other words, the body affords, or creates a milieu, for dancing.

Placing the body clearly at the center of dance—in particular for the teaching of dance—offers a new perspective for pedagogy. And yet, placing the body at the center of dance re-centers pedagogy as well. This research revealed that the pedagogy employed had a very specific effect on the research. At the same time, the nature of the research also shaped the pedagogical approach. In this section, I will discuss how the pedagogy and the research were interwoven and influential in coming to understand how dancers develop *knowing in the body*.

First, the pedagogy used in the research, and the researching of a pedagogical strategy throughout the study, created an environment that favored exploration and integration of information about the body on physical, intellectual and social levels. And while the pedagogical approach shaped what and how the students learned the students' learning reciprocally impacted the pedagogy. For example, the students' questions in the courses, or in their journals, often were revisited in class as they offered different ways of thinking about the information. At the same time, the students' experiences and the sharing of their experiences shaped the development of material in a given class.

Second, the environment engaged the students and provided experiences for them to process information through many sensory modalities (visual, tactile, kinesthetic). This multi-modal approach served students on many levels. By combining touch and sensory exploration with familiar movement the dancers were offered both concrete models and discrete images. The individual dancers' explorations with their bodies, took place both inside and outside a traditional dance classroom. Within this learning environment, the body was integrated into the pedagogical center.

Third, the institutional support for the research and the pedagogical approach was a key factor in what the students learned and how they learned it. The mission of Texas Woman's University is to "develop artistic excellence and integrity" through their goals of "providing a creative and collaborative learning environment which challenges students ... and fosters the unified development of physical, intuitive, and intellectual endeavors, to prepare dance artists and scholars to meet the demands of an ever-changing dance world" ([http://www.twu.edu/soa/dance/pages/dance\\_mission.html](http://www.twu.edu/soa/dance/pages/dance_mission.html), retrieved 12//30/06). The TWU dance department's commitment had a profound influence on the design of the courses, as well as helping the dancers develop confidence in accessing the somatic information and applying the information to their performance as dancers.

Fourth, the study was explicitly designed to provide time for each individual to make meaning of the information and experiences offered in the courses. This liberal time structure enabled the students to move beyond initial questions and perceptions to discover new information. Engaging with the anatomic material and engaging with the explorations for an entire semester developed the dancers' confidence and trust, not only

with the concepts presented in the classes but in the application of these concepts to dancing. The course design, in particular the Experiential Anatomy courses, served as a pivot point<sup>63</sup> for many of the dancers in this study—for thinking about their bodies and in thinking about their learning. Each dancer negotiated a new relationship with her body, or with information about the body as the result of participating in this research. In this place, learning occurred and a new understanding emerged for all of the dancers, providing each individual with some way of *knowing in the body*.

Fifth, because of the flexible nature of the research and the pedagogy, the dancers were able to adapt course goals to complement and support their individual goals. Finally, the social support for the research in other courses the dancers were taking created an additional opportunity for application and integration of the information presented. This opportunity increased the dancers' enthusiasm for the work they were experiencing throughout the study.

These aspects of the research are important in considering pedagogical strategies, particularly those focused on creating an environment in which the dancer can discover and understand her body as the core of her dancing. Within a body-centered environment, a balanced interface of understanding the body in motion and the artistry of the body in motion develops. Furthermore, a body-centered environment encourages individual dancers to inquire, explore and create—about their bodies, with their bodies and in their bodies—as an integral part of their dancing performance.

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<sup>63</sup> Ellsworth (2005), using Winnicott's "transitional space" describes a pivot point as a convergence for events, sensations, actions and experiences – the time and place out of which the experiences and learning emerge. In this study, the classroom and the pedagogy created this transitional space for the dancers. The value of this information is revealed at the level of the individual.

Learning about the body in the dance studio, but outside of a traditional dance technique course, allows the dancer to apply this information in a movement context, to solve problems she may have been having in a particular dance situation or to invent new challenges for herself. However, as was demonstrated in the Ballet II class, information about the body can be incorporated into a traditional class. Placing the body at the center of dance training does not supplant traditional information about dancing; instead it aids the dancer in developing an understanding of her body performing a particular movement.

#### *Development of a Physiosomatic Pedagogy*

I close this chapter and dissertation with a few comments regarding the development of a physiosomatic pedagogy. A physiosomatic pedagogy honors the study and exploration of the body, and places the dancer's body at the center of the dance environment, thus creating a link for the individual dancer, both with her body and with the dance milieu in which she is working. A physiosomatic pedagogy emphasizes this intersection between dancer and dancing. Specifically, a physiosomatic pedagogy creates the following: 1) An environment that supports and encourages curiosity for learning about the body and knowing in the body, 2) an environment that favors exploration and integration of information about the body on a physical, intellectual and social level and enhances dancers' understanding and integration of this information and, 3) an environment that provides for a multi-modal pedagogical approach to teaching and learning. In each of these examples, offering both concrete models and discrete images, touch and sensory exploration, and linking concepts to movement the dancers are familiar

with, an environment of self-discovery is facilitated, an environment in which the dancers can make meaningful links with the information and experiences offered in their dancing.

In addition, a physiosomatic environment acknowledges how cultural and social factors influence the ways in which learning takes place and creates an environment that honors individuality. Finally, a physiosomatic environment encourages an understanding of the body within movement to further develop the physical expressiveness of the dancer. When information about the body interfaces with technical vocabulary and concepts, even in the most highly codified forms of dance, dancers develop *knowledge* of how their bodies perform these motions and actions.

In summary, while there are many different approaches to pedagogy, creating an environment for learning, in which dancers learn about their bodies, in their bodies—where the knower and the known are one—offers a means for the individual dancer to meet the demands of the dance milieu in which she is working. This body-centered approach integrates the different worlds a dancer is working in and facilitates development of a dancer's *knowing in the body*. This “knowing” emerges as an aspect of dancing both in the body and in the world of dance, as well as in the world at large. Placing the body back in the center of dance synthesizes information about bodies, the individual's body and the individual's body dancing. This synthesis is illustrated in the diagram that follows.

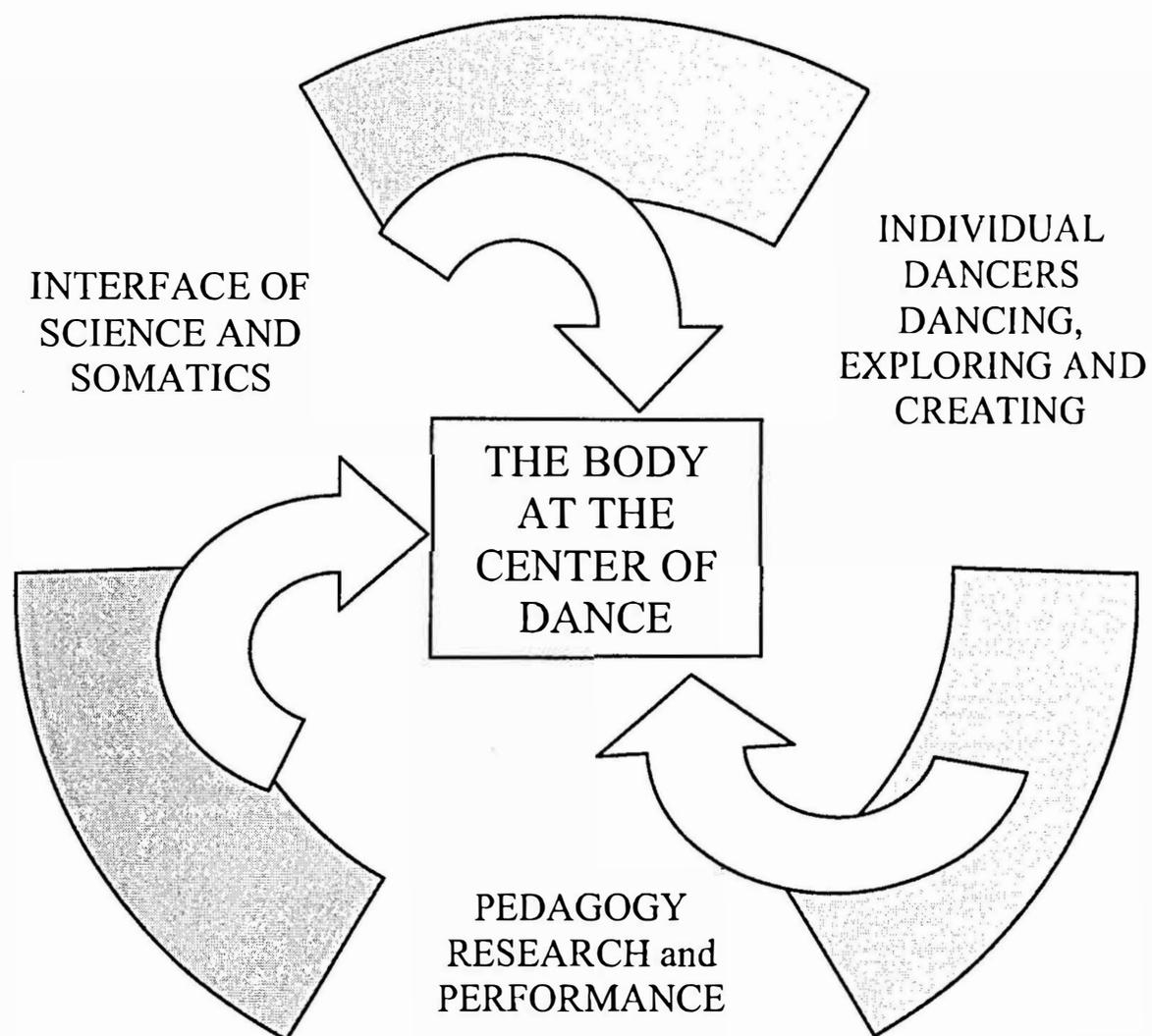


Figure 7: Re-Placing the body at the center of dance.

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### Concluding Comments

If a dissertation is a journey, then it includes a point of departure and a destination. However, upon arriving at the anticipated goal, I clearly see new routes to explore, starting from the “end” and continuing forward through a new beginning. Having developed a means for understanding the travels I wish to pursue, and in taking forward the ideas, questions, and new perspectives the study has generated, the following options for future research in this domain emerge.

Creating an environment where dancers learn about their bodies, in their bodies, creates a personal connection for each dancer to her training and her dancing. However, this pedagogical approach is not limited to learning dance kinesiology or applied in the technique classroom only. A body-centered curriculum is a natural outgrowth of a body centered environment. When a dancer works from a body centered perspective, she discovers a specific stimulus for choreographic or other creative explorations. In addition, when a dancer accesses her lived experience of dancing, of her body moving in the world, this bodily experience contributes to her ability to discuss or write about dance.

Dance history, composition and theory can be taught from the perspective of the body. Having dancers use their bodies as “vehicles for analytic thinking,” Albright (2003) advocates that students “engage in a corporeal and conscious crossing over to learn through our bodies what can never be taught through our books” (p. 182). In addition, Green (1999, 2002) sees somatic and creative work as tools for personal change with in sociopolitical contexts.

The development of a body-centered curriculum makes visible links with research in other disciplines. *Knowing in the body* is a phenomenon that links to psychology and motivation and could be studied in greater depth within these domains. In addition, understanding how dancers develop knowledge in their bodies contributes to research conducted in the areas of embodied cognition, affordances and to an understanding of the development of epistemological frameworks. Yet, of utmost importance, *knowing in the body* is a personal affirmation for the dancer in her dancing.

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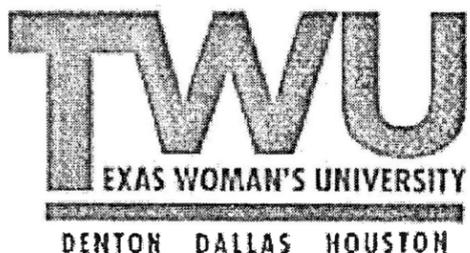
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APPENDIX A

Institutional Review Board Approvals and Consent Forms



**Institutional Review Board**  
Office of Research and Sponsored Programs  
P.O. Box 425619, Denton, TX 76204-5619  
940-898-3378 Fax 940-898-3416  
e-mail: IRB@twu.edu

November 6, 2003

Ms. Margaret Stalder  
Department of Dance

Social Security # 520-84-5845

Dear Ms. Stalder:

*Re: Biomechanic Analysis of Movement in the Supporting Leg in the Execution of a Dance Movement*

The above referenced study has been reviewed by the TWU Institutional Review Board (IRB) and appears to meet our requirements for the protection of individuals' rights.

If applicable, agency approval letters must be submitted to the IRB upon receipt PRIOR to any data collection at that agency. A copy of the approved consent form with the IRB approval stamp and a copy of the annual/final report are enclosed. Please use the consent form with the most recent approval date stamp when obtaining consent from your participants. The signed consent forms and final report must be filed with the Institutional Review Board at the completion of the study.

This approval is valid one year from November 06, 2003. According to regulations from the Department of Health and Human Services, another review by the IRB is required if your project changes in any way. If you have any questions, feel free to call the TWU Institutional Review

Sincerely,

Dr. Linda Rubin, Chair  
Institutional Review Board - Denton

enc.

cc. Dr. Penny Hanstein, Department of Performing Arts - Dance  
Dr. Young-Hoon Kwon, Department of Kinesiology

Texas Woman's University  
Consent to Participate in Research

*Biomechanic Analysis of the Supporting Leg in the Execution of a Specific Dance Movement*

Margaret Stalder, M.S. ....898-2065  
Advisor: Young-Hoo Kwon, Ph.D .....898-2598

Explanation and Purpose of the Research

This project is an exploration of movement in the standing or supporting leg during the execution of a progression of a simple to more complex dance movement. This research is being conducted as part of the requirements for KINS 6913-15, Independent study/Analysis Techniques in Biomechanics. You have volunteered from a pool of interested participants enrolled in Ballet III (DNCE 3111), at Texas Woman's University. You will be briefed on the intent of the study, complete a questionnaire and be tested on specific dance movements in the Biomechanics Lab in Pioneer Hall, room 124 on the campus of Texas Woman's University. For the purposes of this study only, your ballet teacher will assign a rank order of the participants for their skill level in general and for the specific exercise to be observed in this study. This is a subjective measurement and will be limited to a rank of highly skilled or moderately skilled as determined by classical ballet standards.

Research Procedures

The skill to be analyzed is rond de jambe a terre en dehors, executed at three heights. Rond de jambe is a circular movement of the foot and leg from the front of the body to the back. The study will look at how you are balancing/counterbalancing while executing the movement of rond de jambe. In addition, you will be asked to balance on one leg for 10 seconds without moving the gesture leg.

This analysis will be based on information obtained from three types of equipment.

1. Force plate – this non-moving platform measures the ground reaction force through sensors – for the dancer it is no different than standing on the floor.
2. Electromyography – (EMG) Electromyography is a process for looking at generation of electrical activity in a specific muscle. This is measured by placing surface electrodes will be placed on your bare skin over large muscles in the hip, thigh and lower leg. These record onset of muscle action and duration of the muscle contraction.
3. Video motion analysis. Reflective markers will be placed on your hip, abdomen, sternum and the side of the supporting leg. These points will be 'read' by the cameras for creation of a spatial model of the balancing during rond de jambe.

The overview of the testing and completion of the questionnaire (2 pages) will take approximately 30 minutes. The set up of the equipment and practice of the skill in a new environment AND the data collection will take approximately one hour. If you are interested in observing the video and looking at the data in graph form, this will take approximately 30 minutes. Total time: 2 hours.

Initials: Page 1 of 4

Approved by the  
Texas Women's University  
Institutional Review Board  
November 6, 2003

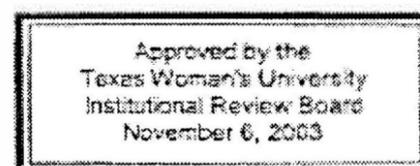
Video data will be converted into a 'stick figure' representation for purposes of analysis. The other information from the force plate and the EMG will be calibrated to create a numerical 'picture' of the actions of the standing leg in rond de jambe. The original video information will be destroyed when this process is complete. No one but the principle investigator, and her advisor will have access to the raw data.

### Potential Risks

An overview of the risks and benefits will be presented to you during the initial meeting. The risks of participation are as follows:

1. **Loss of Confidentiality:** Participants will be identified as numbers, as individuals and as part of grouped data. Because of the locations for the reflective marker for motion analysis (on the shoulders and at the top of the sternum), participant's faces will not be excluded from the raw video data. Processing of the video data involves converting the reference points to a line diagram, so no identification from the digitized video will be possible. No names will be released in the discussion or circulation of the results. Privacy and confidentiality will be protected in the analysis and discussion of the data. Data will be stored with the principal investigator until April 15, 2004, after which time it will be destroyed. The principal investigator and her advisor will be the only personnel accessing the data for this study.
2. **Force Platform:** Minimal risk is involved with the use of the force platform, which is a stable surface which reads oscillations in the center of gravity. Participants will find this to be a novel environment in which to work. For example, participants will feel the change in floor surface (from the platform to the deck on which the platform is mounted). Participants will be provided with an orientation to this environment prior to testing and will wear cotton socks to minimize friction in the moving leg without interfering with balancing ability. The movement of rond de jambe will require that the participant be able to balance on one leg. Participants for this study have demonstrated their ability to do this with placement in Dance 3111. Any 'loss' of balance will not result in a fall, but merely a lowering of the gesture leg and a step to the side.
3. **EMG/Risk of Embarrassment:** Minimal risk is involved with use of the electromyographic leads. These sensors will be attached to the skin of the participant with an adhesive surface. Subjects will be asked to try the adhesive strip during the orientation to determine if they have an allergic or sensitive reaction to the adhesive. A similar adhesive is used to attach the reflective surfaces for the video analysis. The adhesives used are the market standard, and no known allergic reaction to the material has been seen. Students will be asked if they have a sensitivity to the adhesive during overview session. Due to the importance of locating specific muscles and bony landmarks, dancers will be tested in dance briefs and a sports bra. Dancers will be advised of this in the recruitment session, so it will be assumed that they will be comfortable being tested in this clothing. The doors to the lab will be locked and Margaret Stalder will be the only person collecting the data.

Initials: \_\_\_\_\_  
Page 2 of 4



Risks of embarrassment will be minimized by locking the doors to the testing facility, describing the testing protocol and minimizing time spent in the testing facility. Only one participant will be tested at one time. Participants will be given the opportunity to end the testing session at any time if they do not feel comfortable.

4. Video Analysis: Risks involved with video analysis are limited to use of the light source for the camera for full illumination of the reflective markers. Dancers are well accustomed to working in such conditions as they frequently perform on a stage with theatrical lighting. Subjects will be asked if they are disoriented with the presence of the lights prior to data acquisition. This test requires adhesion of reflective markers to key bony landmarks, adhesive would be the same as is used for the emg surface sensors.

#### Confidentiality

As a participant, you will be identified in the testing and treatment modality by number for data collection. All data will be reduced to numerical, graph or model format for reporting. Results of this study will be presented at regional and national conferences and will be submitted as a manuscript for publication. *Confidentiality will be protected to the extent that is allowed by law.*

*The researchers will try to prevent any problem that could occur because of this research. You should let the researchers know at once if there is a problem and they will help you. However, TWU does not provide medical services or financial assistance for injuries that might happen because you are taking part in this research*

#### Voluntary Participation and withdrawal

Participation in this study is voluntary. Refusal to participate will involve no penalty or loss or benefits to which you are otherwise entitled. You may discontinue participation at any time without penalty or loss of benefits. To terminate your participation you should contact Margaret Stalder at the address or phone listed below.

#### Benefits of participation in the study

This study will serve as a pilot study, establishing a baseline for further research in this area. Benefits to the participants will be increased awareness of the standing or supporting leg. A summary of the data (group data) will be made available to all participants. This will consist of a one sheet synopsis of the findings of the investigation. Individuals wishing to see their individual results will be instructed to see the principal investigator and will see the converted data summary, i.e. kinematic model of the body (stick figure), graphs of muscle activity and changes in the center of mass.

Initials:

Page 3 of 4

Approved by the  
Texas Woman's University  
Institutional Review Board  
November 6, 2003

Questions Regarding the Study:

*You will be given a copy of this signed and dated consent form to keep. If you have any questions about the research study you should ask the researchers; their phone numbers are at the top of this form. If you have questions about your rights as a participant in the research or the way this study has been conducted, you may contact the Texas Woman's University Office of Research and Grants at 940-898-3375 or via e-mail at IRB@twu.edu.*

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Participant's signature:

Date

*The above consent form was read, discussed and signed in my presence. In my opinion, the person signing said consent form did so freely and will full knowledge of its contents.*

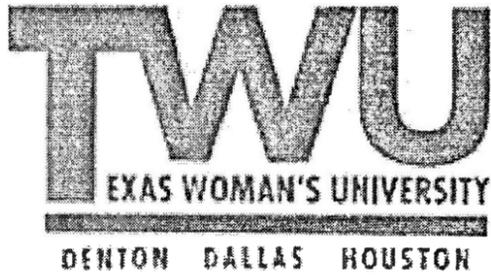
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Margaret Stalder, Research director

Date

940-898-2065  
stalder@twu.edu

Approved by the  
Texas Woman's University  
Institutional Review Board  
November 6, 2003



**Institutional Review Board**  
Office of Research and Sponsored Programs  
P.O. Box 425619, Denton, TX 76204-5619  
940-898-3378 Fax 940-898-3416  
e-mail: IRB@twu.edu

August 2, 2004

Ms. Margaret Wilson  
Programs in Dance  
DGL Texas Woman's University

Social Security # 520-84-5845

Dear Ms. Wilson:

*Re: Introduction to Dance as an Art Form: A Somatic Approach*

The above referenced study has been reviewed by the TWU Institutional Review Board (IRB) and appears to meet our requirements for the protection of individuals' rights.

If applicable, agency approval letters must be submitted to the IRB upon receipt PRIOR to any data collection at that agency. A copy of the approved consent form with the IRB approval stamp and a copy of the annual/final report are enclosed. Please use the consent form with the most recent approval date stamp when obtaining consent from your participants. The signed consent forms and final report must be filed with the Institutional Review Board at the completion of the study.

This approval is valid one year from July 09, 2004. According to regulations from the Department of Health and Human Services, another review by the IRB is required if your project changes in any way, and the IRB must be notified immediately regarding any adverse events. If you have any questions, feel free to call the TWU Institutional Review Board.

Sincerely,

Dr. Linda Rubin, Chair  
Institutional Review Board - Denton

enc.

cc. Dr. Penny Hanstein, Department of Performing Arts - Dance

TEXAS WOMAN'S UNIVERSITY  
CONSENT TO PARTICIPATE IN RESEARCH

TITLE: Introduction to dance as an art form: a somatic approach.

INVESTIGATOR: Margaret Wilson

(940) 898-2065

RESEARCH ADVISOR: Penelope Hanstein, Ph.D.

(940) 898-2037

You are being asked to participate in a research study for Margaret Wilson, who is a doctoral student at Texas Woman's University. The purpose of this inquiry is to observe, analyze and describe the processes that dancers use to make meaning of kinesiological information through somatic exploration. Specifically, what is the process of constructing knowledge in the body from material of a scientific nature, and does exploring the concepts through movement exploration facilitate this? This will take place within the context of this course, Dance 1392: Introduction to dance as an art form.

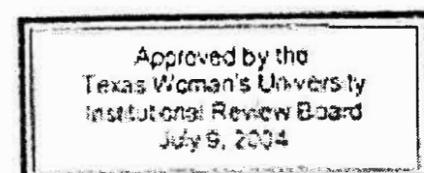
Specific questions I will be asking in my research:

1. How is scientific information such as kinesiology utilized by dance students?
2. What is somatic knowledge? When is 'knowing through the body' accessible to the mind?
3. Does experiential work with the body focused on kinesiological principles result in sense making for dancers?

This investigation will be conducted on new students enrolled in the dance program at Texas Woman's University during the Fall 2004 semester. In this class you will be introduced to anatomical and kinesiological concepts which will be beneficial to you as a dancer. In addition we will explore these concepts within movement. As a part of the class structure, you will be assigned to keep journals which discuss pertinent information from each class. You will also be asked to make entries in your journals during the week to reflect on how you made use of the information during subsequent movement experiences. While this journal is required for all members of the class, it will also be used as data for this study. If you participate in the research, your journal will be collected at the end of the semester for Xeroxing. In addition, the data from the late-term interview will be processed for the research. All identifiable information in the journal will be eliminated. The journal information will be coded and collated to see if there are themes that emerge about how the students are making meaning of the kinesiological information being introduced in the course.

There are inherent risks to you as a participant in this study, but all efforts will be made to minimize these. This investigation involves the risks of release of confidential information, thus potential loss of privacy. *Confidentiality will be protected to the extent that is allowed by the law.*

Initials: \_\_\_\_\_  
Page 1 of 3



**Risk 1: Confidentiality.** The journal responses will be xeroxed and assigned a participant number. All identifying information will be removed or replaced with a pseudonym. Late-term interview responses will be summarized on a standard form and will only be identified by number.

**Risk 2: Vulnerability of participants in journal entries.** Students will be reminded that the nature of the writing exercise is for them to articulate discoveries they are making about their dancing as it relates to the information from the experiential component of the course. There are no right or wrong answers. All participants in the study will have the right to eliminate any responses from the journal at any time. Prior to handing the journal entries at the end of the semester, participants will review the data and have the right to eliminate any responses they do not wish to have considered or discussed.

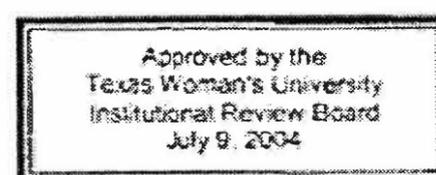
**Risk 3: Grade coercion.** All students in the course will complete the journal activity and the late-term interview. Any student has the right to remove themselves from the study at any time without risk to their grade. Students in the course will be re-contacted at the end of the semester to confirm their interest in participation in the research. In addition, any students who initially wish to participate in the research may remove themselves at anytime by e-mailing the participating staff member. The researcher is the instructor for the course, but she will not know who is participating in the study until after grades have been posted at the end of the fall semester.

**Risk 4: Discomfort.** Students may feel uncomfortable revealing their feelings in the journals and during the interview. Students will have the opportunity to eliminate or erase any information from the journals at any time during the semester. The interviewer will inform them before beginning that if they are uncomfortable they may stop in the interview at any time and that all information from the present interview will be deleted.

There is no additional time required for your participation in the research outside of what is required for the course, DNCE 1392. Direct benefits to the participants will be an enhanced understanding of kinesiological information which was introduced through class lecture and experienced through movement exploration. At the end of the semester there will be a debriefing about the course itself. Students participating in the research will also receive an abstract of the findings of this study. This study will comprise baseline information for further investigation on how knowledge is constructed in the body. Information from the study will contribute to the information gained from participation in the course.

If you have any questions about the research study you should ask the researcher; contact information is at the top of this form. If you have questions about your rights as a participant in this research or the way this study has been conducted you may contact the Office of Research and Grants Administration at 940-898-3377 or e-mail [irb@twu.edu](mailto:irb@twu.edu).

Initials: \_\_\_\_\_  
Page 2 of 3



The researcher will try to prevent any problem that might arise because of this research. You should let the researcher know at once if there is a problem and they will help you. However, TWU does not provide medical services or financial assistance for injuries that might happen because you are taking part in this research.

Participation is completely voluntary and you may withdraw at anytime without penalty. If you have any questions, please contact the investigator at the above number. You will be given a copy of this dated and signed consent form to keep.

\_\_\_\_\_  
Signature of Participant

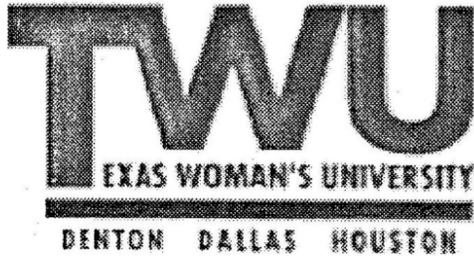
\_\_\_\_\_  
Date

The above consent form was read, discussed, and signed in my presence. In my opinion, the person signing said consent form did so freely and with full knowledge of its contents.

\_\_\_\_\_  
Signature of Participating Staff Member

\_\_\_\_\_  
Date

Approved by the  
Texas Women's University  
Institutional Review Board  
July 9, 2004



**Institutional Review Board**  
Office of Research and Sponsored Programs  
P.O. Box 425619, Denton, TX 76204-5619  
940-898-3378 Fax 940-898-3416  
e-mail: IRB@twu.edu

November 5, 2004

Ms. Margaret Wilson  
Department of Dance

Social Security # 520-84-5845

Dear Ms. Wilson:

*Re: Biomechanic Analysis of Movement in the Supporting Leg in the Execution of a Dance Movement*

The request for an extension of your IRB approval for the above referenced study has been reviewed by the TWU Institutional Review Board (IRB) and appears to meet our requirements for the protection of individuals' rights.

If applicable, agency approval letters must be submitted to the IRB upon receipt PRIOR to any data collection at that agency. A copy of all signed consent forms and an annual/final report must be filed with the Institutional Review Board at the completion of the study. A copy of the approved consent form with the IRB approval stamp is enclosed. Please use a copy of this stamped consent form when obtaining consent from your participants.

This extension is valid one year from November 6, 2004. According to regulations from the Department of Health and Human Services, another review by the IRB is required if your project changes in any way. If you have any questions, feel free to call the TWU Institutional Review

Sincerely,

Dr. David Nichols, Chair  
Institutional Review Board - Denton

cc. Dr. Penny Hanstein, Department of Performing Arts - Dance  
Dr. Young-Hoo Kwon, Department of Kinesiology

Simply the **BEST**

Texas Woman's University  
Consent to Participate in Research

*Biomechanic Analysis of the Supporting Leg in the Execution of a Specific Dance Movement.*

Margaret Wilson, M.S. ....898-2065  
Advisor: Young-Hoo Kwon, Ph.D .....898-2598

Explanation and Purpose of the Research

This project is an exploration of movement in the standing or supporting leg during the execution of a progression of a simple to more complex dance movement. This research is being conducted as part of the requirements for KINS 6911-15, Motion Analysis Techniques in Biomechanics. You have volunteered from a pool of interested participants enrolled in Ballet III (DNCE 3111), at Texas Woman's University and from the Ft. Worth/Dallas Ballet Company. You will be briefed on the intent of the study, complete a questionnaire and be tested on specific dance movements in the Biomechanics Lab in Pioneer Hall, room 124 on the campus of Texas Woman's University. For the purposes of this study only, your ballet teacher or artistic director will assign a rank order of the participants for your skill level in general and for the specific exercise to be observed in this study. This is a subjective measurement and will be limited to a rank of highly skilled or moderately skilled as determined by classical ballet standards.

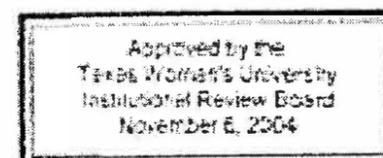
Research Procedures

The skill to be analyzed is rond de jambe a terre en dehors, executed at two heights, in 2 positions of external rotation and with hands off and hands on an external support. Rond de jambe is a circular movement of the foot and leg from the front of the body to the back. The study will look at how you are balancing/counterbalancing while executing the movement of rond de jambe, patterns of muscular activity and gesture leg accuracy. In addition, you will be asked to participate in a test designed to estimate the hip joint center.

This analysis will be based on information obtained from three types of equipment.

1. Force plate -- this non-moving platform measures the ground reaction force through sensors -- for the dancer it is no different than standing on the floor.
2. Electromyography -- (EMG) Electromyography is a process for looking at generation of electrical activity in a specific muscle. This is measured by placing surface electrodes on your bare skin over large muscles in the hip, thigh and lower leg. These record onset of muscle action and duration of the muscle contraction.
3. Video motion analysis. Reflective markers will be placed on your hip, abdomen, sternum and the side of the supporting leg. These points will be 'read' by the cameras for creation of a spatial model of the balancing during rond de jambe.

Initials: \_\_\_ Page 1 of 4



4. Hip range of motion and girth measurements. A goniometer will be used to measure external rotation of the thigh at the hip joint. In addition measures of leg and hip circumference will be taken.

5. Functional hip measurement. Gesture leg will be immobilized in a foam and velcro sleeve with metal inserts. The function of this test is to calculate the hip joint center. Participants will stand on a platform with an external support and move the leg in the sleeve front, back and side.

6. Qualitative Analysis: A LMA movement analyst will record qualitative data regarding effort, efficiency and quality of the movement.

The overview of the testing and completion of the questionnaire (2 forms) will take approximately 30 minutes. The set up of the equipment and practice of the skill in a new environment AND the data collection will take approximately one hour. If you are interested in observing the video and looking at the data in graph form, this will take approximately 30 minutes. Total time: 2 hours.

Video data will be converted into a 'stick figure' representation for purposes of analysis. The other information from the force plate and the EMG will be calibrated to create a numerical 'picture' of the actions of the standing leg in rond de jambe. The original video information will be destroyed when this process is complete. No one but the principle investigator, and her advisor will have access to the raw data.

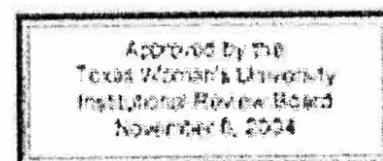
#### Potential Risks

An overview of the risks and benefits will be presented to you during the initial meeting. The risks of participation are as follows:

1. Loss of Confidentiality: Participants will be identified as numbers, as individuals and as part of grouped data. Because of the locations for the reflective marker for motion analysis (on the shoulders and at the top of the sternum), participant's faces will not be excluded from the raw video data. Processing of the video data involves converting the reference points to a line diagram, so no identification from the digitized video will be possible. No names will be released in the discussion or circulation of the results. Privacy and confidentiality will be protected in the analysis and discussion of the data. The principal investigator and her advisor will be the only personnel accessing the data for this study.

2. Force Platform: Minimal risk is involved with the use of the force platform, which is a stable surface which reads oscillations in the center of gravity. Participants will find this to be a novel environment in which to work. For example, participants will feel the change in floor surface (from the platform to the deck on which the platform is mounted). Participants will be provided with an orientation to this environment prior to testing and will wear cotton socks to minimize friction in the moving leg without interfering with

Initials: \_\_\_\_ Page 2 of 4



balancing ability. The movement of rond de jambe will require that the participant be able to balance on one leg. Participants for this study have demonstrated their ability to do this with placement in Dance 3111. Any 'loss' of balance will not result in a fall, but merely a lowering of the gesture leg and a step to the side.

3. EMG/Measurements of External Rotation and Girth Measurement. Risk of Embarrassment: Minimal risk is involved with use of the electromyographic leads. These sensors will be attached to the skin of the participant with an adhesive surface. Subjects will be asked to try the adhesive strip during the orientation to determine if they have an allergic or sensitive reaction to the adhesive. A similar adhesive is used to attach the reflective surfaces for the video analysis. The adhesives used are the market standard, and no known allergic reaction to the material has been seen.

Students will be asked if they have a sensitivity to the adhesive during overview session. Due to the importance of locating specific muscles and bony landmarks, dancers will be tested in dance briefs and a sports bra, with black tights over the top. Dancers will be advised of this in the recruitment session, so it will be assumed that they will be comfortable being tested in this clothing. The personnel assisting are male and female biomechanics faculty and students in the Biomechanics lab.

Risks of embarrassment will be minimized by closing the doors to the testing facility, describing the testing protocol and minimizing time spent in the testing facility. Participants will be scheduled in an overlapped fashion so that they may watch the proceedings and orient themselves to the testing environment. Participants will be given the opportunity to end the testing session at any time if they do not feel comfortable.

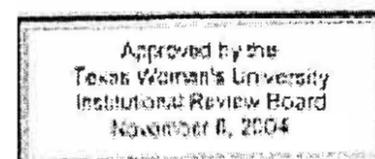
4. Video Analysis: Risks involved with video analysis are limited to use of the light source for the camera for full illumination of the reflective markers. Dancers are well accustomed to working in such conditions as they frequently perform on a stage with theatrical lighting. Subjects will be asked if they are disoriented with the presence of the lights prior to data acquisition. This test requires adhesion of reflective markers to key bony landmarks, adhesive would be the same as is used for the emg surface sensors.

#### Confidentiality

As a participant, you will be identified in the testing and treatment modality by number for data collection. All data will be reduced to numerical, graph or model format for reporting. Results of this study will be presented at regional and national conferences and will be submitted as a manuscript for publication. *Confidentiality will be protected to the extent that is allowed by law.*

*The researchers will try to prevent any problem that could occur because of this research. You should let the researchers know at once if there is a problem and they will help you. However, TWU does not provide medical services or financial assistance for injuries that might happen because you are taking part in this research*

Initials \_\_\_ Page 3 of 4



Voluntary Participation and withdrawal

Participation in this study is voluntary. Refusal to participate will involve no penalty or loss or benefits to which you are otherwise entitled. You may discontinue participation at any time without penalty or loss of benefits. To terminate your participation you should contact Margaret Wilson at the address or phone listed below.

Benefits of participation in the study

This study will serve as a pilot study, establishing a baseline for further research in this area. Benefits to the participants will be increased awareness of the standing or supporting leg. A summary of the data (group data) will be made available to all participants. This will consist of a one sheet synopsis of the findings of the investigation. Individuals wishing to see their individual results will be instructed to see the principal investigator and will see the converted data summary, i.e. kinematic model of the body (stick figure), graphs of muscle activity and changes in the center of mass.

Questions Regarding the Study:

*You will be given a copy of this signed and dated consent form to keep. If you have any questions about the research study you should ask the researchers; their phone numbers are at the top of this form. If you have questions about your rights as a participant in the research or the way this study has been conducted, you may contact the Texas Woman's University Office of Research and Grants at 940-898-3375 or via e-mail at IRB@twu.edu.*

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Participant's signature:

Date

*The above consent form was read, discussed and signed in my presence. In my opinion, the person signing said consent form did so freely and with full knowledge of its contents.*

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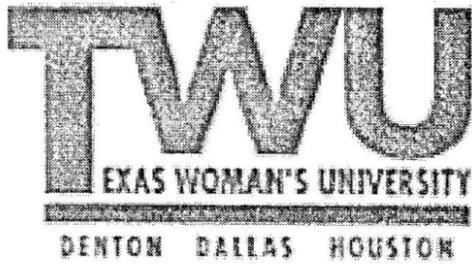
Margaret Wilson, Research director

Date

940-898-2065

mwilson1@mail.twu.edu

Approved by the  
Texas Women's University  
Institutional Review Board  
November 6, 2004



**Institutional Review Board**  
Office of Research and Sponsored Programs  
P.O. Box 425619, Denton, TX 76204-5619  
940-898-3378 Fax 940-898-3416  
e-mail: IRB@twu.edu

November 9, 2004

Ms. Margaret Wilson  
Performing Arts - Dance

Social Security # 520-84-5845

Dear Ms. Wilson:

*Re: Reflections on Knowing in the Body - Summarizing Graduate Level Student Responses in  
Special Topics Course: Experiential Anatomy*

The request for an extension of your IRB approval for the above referenced study has been reviewed by the TWU Institutional Review Board (IRB) and appears to meet our requirements for the protection of individuals' rights.

If applicable, agency approval letters must be submitted to the IRB upon receipt PRIOR to any data collection at that agency. A copy of all signed consent forms and an annual/final report must be filed with the Institutional Review Board at the completion of the study. A copy of the approved consent form with the IRB approval stamp is enclosed. Please use a copy of this stamped consent form when obtaining consent from your participants.

This extension is valid one year from December 8, 2004. According to regulations from the Department of Health and Human Services, another review by the IRB is required if your project changes in any way. If you have any questions, feel free to call the TWU Institutional Review Board.

Sincerely,

A handwritten signature in black ink that reads 'David J. Nichols'.

Dr. David Nichols, Chair  
Institutional Review Board - Denton

cc. Dr. Penny Hanstein, Department of Performing Arts - Dance

TEXAS WOMAN'S UNIVERSITY  
CONSENT TO PARTICIPATE IN RESEARCH

TITLE: Reflections on Knowing in the Body - summarizing graduate level student responses in a special topics course: Experiential Anatomy

INVESTIGATOR: Margaret Wilson 898-2065  
RESEARCH ADVISOR: Penelope Hanstein, Ph.D. 898-2037

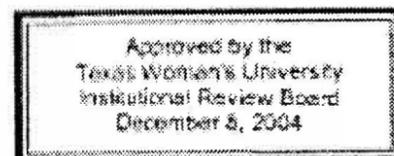
You are being asked to participate in a research study for Margaret Wilson at Texas Woman's University. The purpose of this phenomenological inquiry is to observe, analyze and describe the processes that dancers use to make meaning of kinesiological information through somatic exploration. Specifically, what is the process of constructing knowledge in the body from material of a scientific nature, and is this facilitated by exploring the concepts through movement exploration? The analysis and interpretation of this pilot study will lay the foundation for further research and development of an understanding about how kinesthetic knowledge or knowing is constructed, contextually and experientially.

Specific questions I will be asking in my research:

1. How is scientific information such as kinesiology utilized by dance students?
2. What is somatic knowledge? When is 'knowing through the body' accessible to the mind?
3. How is kinesthetic knowing or knowledge transferred?
4. Does experiential work with the body focused on kinesiological principles result in sense making for dancers?
5. What is the role of image, schema or metaphor in understanding what the scientific information 'feels like' in the body? What is the role of language and writing in communicating this information?
6. How is kinesthetic knowledge created? How is it used? Do, and when do, students want to understand and be able to use this information?

This investigation will be conducted on dance students at Texas Woman's University during the Spring 2004 semester enrolled in DNCE 5211-01. The course will be team taught by the principal investigator, Margaret Wilson and Sarah Gamblin, Assistant Professor of Dance. As a part of the class structure, you will be assigned to keep journals which discuss pertinent information from each lesson. You will also be asked to make entries in your journals during the week to reflect on how you made use of the information during subsequent movement experiences. While this journal is required for all members of the class, it will also be used as data for this study. Each class will be videotaped; this will be an unobtrusive set up which will allow the investigator a means for reviewing the class responses. Participants in the research will be asked to conduct a minimum of one, but no more than two, interviews which will be audio taped. Participant interviews will take from 30 - 60 minutes, during which you will observe video of a segment of class which focuses on a particular movement exploration.

Initials: \_\_\_\_\_  
Page 1 of 3



The interview will ask you to reflect on what you were experiencing in movement at the time, and how you perceive that information now, reflecting back on it. The information from the journals, videotape and audio taped interviews will be coded and collated to see if there are themes that emerge about how the students are making meaning of the kinesiological information being introduced in the course.

There are inherent risks to you as a participant in this study, but all efforts will be made to minimize these. This investigation involves the risks of release of confidential information, thus potential loss of privacy. *Confidentiality will be protected to the extent that is allowed by the law.*

**Risk 1: Confidentiality.** The journal responses will be xeroxed and assigned a participant number. All identifying information will be removed or replaced with a pseudonym. Audio recordings will be collected in reference to the student number. Audio data will be set to identify student only by number, and will be transcribed. If a student identifies themselves in any way, this will be omitted from the transcription. Students will be informed that they are being videotaped, and that this video will be viewed by other participants in the study. A specific focal range for the video view will be defined and an area which lies outside of this will be provided for those not wishing to participate in the research. Participants will be made aware that their bodies may be in the view of the camera for other student's observation. When it is not possible to remove non-participant's image from the video, that segment of the video will not be viewed by anyone other than the investigators. Only the researcher and her faculty advisor will have access to the audio and video tapes.

**Risk 2: Vulnerability of participants in journal entries.** Students will be reminded that the nature of the writing exercise is for them to articulate discoveries they are making about their dancing as it relates to the information from the experiential anatomy. There are no right or wrong answers. All participants in the study will have the right to eliminate any responses from the journal at any time. At the end of the course, all participants will review the data and have the right to eliminate any responses they do not wish to have considered or discussed. This applies to the raw and converted data collected.

**Risk 3: Grade coercion.** All students in the course will complete the journal activity. All students have the right to remove themselves from the study at any time without risk to their grade. Students who do not want to participate in the study and do not want to be enrolled in the class where this study is being conducted will be given the option to take another bodywork course at the same time offered by another instructor.

Also, as the research will be conducted within the confines of a university course, understanding that your participation is voluntary and will in no way affect your grade in the course is necessary. The principal investigator will not be involved in grading; Sarah Gamblin will assign all grades for the course.

Initials: \_\_\_\_\_  
Page 2 of 3

Approved by the Texas Woman's University Institutional Review Board December 8, 2004
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Risk 4: Discomfort. Students may feel uncomfortable revealing their feelings during the interviews. Interviewer will inform them before beginning that if they are uncomfortable they may stop in the interview at any time and that all information from the present interview will be erased.

The maximum loss of time for participating in the research will be two hours for the audio taped interviews. Direct benefits to the participants will be an enhanced understanding of kinesiologic information which they have reviewed through reading and explanation and experienced through movement exploration. Students participating in the research will also receive an abstract of the findings of this study. This study will comprise baseline information for further investigation on how knowledge is constructed in the body. Information from the study will contribute to the information gained from participation in the course. At the end of the semester there will be a debriefing about the course itself.

If you have any questions about the research study you should ask the researcher; contact information is at the top of this form. If you have questions about your rights as a participant in this research or the way this study has been conducted you may contact the Office of Research and Grants Administration at 940-898-3377 or e-mail [irb@twu.edu](mailto:irb@twu.edu).

The researcher will try to prevent any problem that might arise because of this research. You should let the researcher know at once if there is a problem and they will help you. However, TWU does not provide medical services or financial assistance for injuries that might happen because you are taking part in this research.

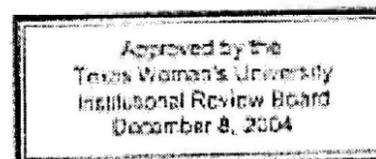
Participation is completely voluntary and you may withdraw at anytime without penalty. If you have any questions, please contact the investigator at the above number. You will be given a copy of this dated and signed consent form to keep.

\_\_\_\_\_  
Signature of Participant

\_\_\_\_\_  
Date

The above consent form was read, discussed, and signed in my presence. In my opinion, the person signing said consent form did so freely and with full knowledge of its contents.

\_\_\_\_\_  
Signature of Investigator





**Institutional Review Board**  
Office of Research and Sponsored Programs  
P.O. Box 425619, Denton, TX 76204-5619  
940-898-3378 Fax 940-898-3416  
e-mail: IRB@twu.edu

January 18, 2005

Ms. Margaret Wilson  
Performing Arts - Dance

Social Security # 520-84-5845

Dear Ms. Wilson:

*Re: Evaluating a Somatic Approach to Teaching DNCE 2121 - Intermediate Ballet II*

The above referenced study has been reviewed by the TWU Institutional Review Board (IRB) and appears to meet our requirements for the protection of individuals' rights.

If applicable, agency approval letters must be submitted to the IRB upon receipt PRIOR to any data collection at that agency. A copy of the approved consent form with the IRB approval stamp and a copy of the annual/final report are enclosed. Please use the consent form with the most recent approval date stamp when obtaining consent from your participants. The signed consent forms and final report must be filed with the Institutional Review Board at the completion of the study.

This approval is valid one year from January 18, 2005. According to regulations from the Department of Health and Human Services, another review by the IRB is required if your project changes in any way, and the IRB must be notified immediately regarding any adverse events. If you have any questions, feel free to call the TWU Institutional Review Board.

Sincerely,

Dr. David Nichols, Chair  
Institutional Review Board - Denton

enc.

cc. Dr. Penny Hanstein, Department of Performing Arts - Dance

TEXAS WOMAN'S UNIVERSITY  
CONSENT TO PARTICIPATE IN RESEARCH

TITLE: Evaluating a somatic approach to teaching DNCE 2121 Intermediate Ballet II.

INVESTIGATOR: Margaret Wilson

898-2065

RESEARCH ADVISOR: Penelope Hanstein, Ph.D.

898-2037

You are being asked to participate in a research study for Margaret Wilson at Texas Woman's University. The purpose of this inquiry is to observe, analyze and describe the processes that dancers use to make meaning of kinesiologic information through somatic exploration in an intermediate level ballet technique class. Working within the ballet curriculum, information about the anatomical structure of the body will be introduced into the class. In addition, specific movement explorations designed to enhance and support ballet vocabulary through an increased understanding of the body will be incorporated. These aspects will be a part of the course; your participation in the research will be to grant me permission to use the written, evaluative and interview data from the class as a part of my research. Specifically I am looking at how knowledge about the body contributes to the development of skill in ballet technique and simultaneously how it informs the dancer as a way of knowing in the body.

Specific questions I will be asking in my research:

1. How is scientific information such as kinesiology utilized in a ballet technique class?
2. What is somatic knowledge? What is 'knowing in the body' and how is this information used by the dancer?
3. Does experiential work with the body focused on kinesiologic principles result in sense making for dancers?

This investigation will be conducted on sophomore and junior level dance students at Texas Woman's University during the spring 2005 semester that are enrolled in DNCE 2121, Intermediate Ballet II. As a part of the class structure, you will be assigned to keep journals which discuss pertinent information from each class. You will also be asked to make entries in your journals during the week to reflect on how you made use of the information during subsequent movement experiences. While this journal is required for all members of the class, it will also be used as data for this study. If you participate in the research, your journal will be collected at the end of the semester for xeroxing. In addition, the data from the mid-term interview will be processed for the research. All identifiable information in the journal will be eliminated. The journal information will be coded and collated to see if there are themes that emerge about how students are making meaning of the kinesiologic information being introduced in the course.

There are inherent risks to you as a participant in this study, but all efforts will be made to minimize these. This investigation involves the risks of release of confidential information, thus potential loss of privacy. *Confidentiality will be protected to the extent that is allowed by the law.*

Page 1 of 3: Initials: \_\_\_\_\_

Approved by the  
Texas Woman's University  
Institutional Review Board  
January 18, 2005

Risk 1: Confidentiality. The journal responses will be xeroxed and assigned a participant number. All identifying information will be removed or replaced with a pseudonym. Mid-term interview responses will be summarized on a standard form and will only be identified by number.

Risk 2: Vulnerability of participants in journal entries. Students will be reminded that the nature of the writing exercise is for them to articulate discoveries they are making about their dancing as it relates to the information from the experiential component of the course. There are no right or wrong answers. All participants in the study will have the right to eliminate any responses from the journal at any time. When handing the journal entries in at the end of the semester, participants will review the data and have the right to eliminate any responses they do not wish to have considered or discussed.

Risk 3: Grade coercion. All students in the course will complete the journal activity and the mid-term interview. Any student has the right to remove themselves from the study at any time without risk to their grade. Students who do not want to participate in the study should contact the staff member who administers this consent form. The researcher is the instructor for the course, but she will not know who is participating in the study until after grades have been posted at the end of the fall semester. At the end of the semester, the designated staff member will revisit the class to facilitate any students wishing to withdraw from the study.

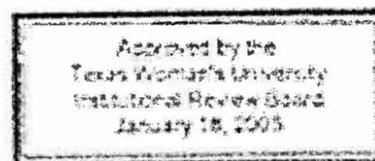
Risk 4: Discomfort. Students may feel uncomfortable revealing their feelings in the journals and during the interview. Students will have the opportunity to eliminate or erase any information from the journals at any time during the semester. Interviewer will inform them before beginning that if they are uncomfortable they may stop in the interview at any time and that all information from the present interview will be disregarded.

There is no additional time involved for participation in the research outside of what is required for the course, DNCE 2121. (Mid-term interview is required for the course.) At the end of the semester there will be a debriefing about the course itself. Students participating in the research will also receive an abstract of the findings of this study. This study will comprise baseline information for further investigation on how knowledge is constructed in the body.

If you have any questions about the research study you should ask the researcher; contact information is at the top of this form. If you have questions about your rights as a participant in this research or the way this study has been conducted you may contact the Office of Research and Grants Administration at 940-898-3377 or e-mail [irb@twu.edu](mailto:irb@twu.edu).

The researcher will try to prevent any problem that might arise because of this research. You should let the researcher know at once if there is a problem and they will help you. However, TWU does not provide medical services or financial assistance for injuries that might happen because you are taking part in this research.

Initials: \_\_\_\_\_ Page 2 of 3



Participation is completely voluntary and you may withdraw at anytime without penalty. If you have any questions, please contact the investigator at the above number. You will be given a copy of this dated and signed consent form to keep.

\_\_\_\_\_  
Signature of Participant

\_\_\_\_\_  
Date

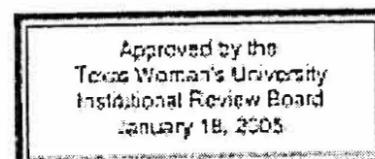
If you would like to receive a summary of the results of this study, please provide an address to which this summary should be sent (permanent address recommended).

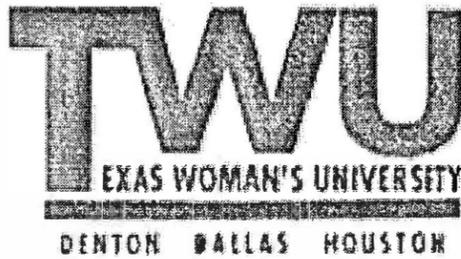
Name: \_\_\_\_\_

Address: \_\_\_\_\_

City, State and Zip code \_\_\_\_\_

e-mail: \_\_\_\_\_





Institutional Review Board
Office of Research and Sponsored Programs
P.O. Box 425619, Denton, TX 76204-5619
940-898-3378 Fax 940-898-3416
e-mail: IRB@twu.edu

April 11, 2005

Ms. Margaret Wilson
Department of Dance

Social Security # 520-84-5845

Dear Ms. Wilson:

Re: Knowing in the Body - Followup and Outside Interviews

The above referenced study has been reviewed by the TWU Institutional Review Board (IRB) and appears to meet our requirements for the protection of individuals' rights.

If applicable, agency approval letters must be submitted to the IRB upon receipt PRIOR to any data collection at that agency. A copy of the approved consent form with the IRB approval stamp and a copy of the annual/final report are enclosed. Please use the consent form with the most recent approval date stamp when obtaining consent from your participants. The signed consent forms and final report must be filed with the Institutional Review Board at the completion of the study.

This approval is valid one year from April 11, 2005. According to regulations from the Department of Health and Human Services, another review by the IRB is required if your project changes in any way, and the IRB must be notified immediately regarding any adverse events. If you have any questions, feel free to call the TWU Institutional Review Board.

Sincerely,

Handwritten signature of David Nichols

Dr. David Nichols, Chair
Institutional Review Board - Denton

enc.

cc: Dr. Penny Hanstein, Department of Performing Arts - Dance
Dr. Penelope Hanstein, Department of Performing Arts - Dance
Graduate School

TEXAS WOMAN'S UNIVERSITY  
CONSENT TO PARTICIPATE IN RESEARCH

TITLE: Knowing in the Body – follow up and outside interviews.

INVESTIGATOR: Margaret Wilson

(940) 898-2095

RESEARCH ADVISOR: Penelope Hanstein, Ph.D.

(940) 898-2037

You are being asked to participate in a research study for Margaret Wilson at Texas Woman's University. The purpose of the research is to determine perspectives on the phenomenon of knowing in the body. Specifically I wish to determine what the process of constructing knowledge in the body from material of a scientific nature is, and how professionals and former students in the field of dance view this experience.

The questions I will ask come from research previously conducted in this venue.

1. Can dancers acquire knowledge about the objective properties of the body, through constant reflection and subjective experience?
2. How is scientific information such as kinesiology utilized by dancers?
3. Are somatic and scientific approaches of knowing about the body mutually exclusive or are they two important and interdependent parts of the whole of the experience of knowing in the body?
4. What does it mean to know something in the body?
5. What do you know in your body?
6. How do you assess that students or dancers have bodily knowledge?
7. Does experiential work with the body focused on kinesiological principles result in sense making for dancers?
8. What is the role of image, schema or metaphor in understanding what the scientific information 'feels like' in the body? What is the role of language and writing in communicating this information?
9. How is kinesthetic knowledge created? How is it used? Do, and when do, dancers want to understand and be able to use this information? How is kinesthetic knowing or knowledge transferred?

This investigation is being conducted on dance students at Texas Woman's University who have participated in Experiential Anatomy (DNCE 5211-01), Introduction to Dance as an Art Form (DNCE 1392), Intermediate Ballet II (DNCE 2121) and in biomechanical research on a specific dance movement (Biomechanical analysis of Grand Rond De Jambe en l'air). In addition, faculty members in dance in academic institutions around the country will participate. The interview will ask you to reflect on how as a dancer meaning is made of kinesiological information, and how you come to "know" this information in your body.

Page 1 of 3  
Initials:

Approved by the  
Texas Woman's University  
Institutional Review Board  
April 11, 2005

The original interview will take no more than 90 minutes and will either be video taped or audio-taped if the interview takes place over the phone. Additional interviews will take no more than two hours (total), but will take place using alternative formats of e-mail or audio-tape for phone interviews). Participants will receive transcripts to be reviewed for accuracy and follow up questions will take place in an e-mail format.

There are inherent risks to you as a participant in this study, but all efforts will be made to minimize these. This investigation involves the risk of release of confidential information, thus potential loss of privacy. *Confidentiality will be protected to the extent that is allowed by the law.*

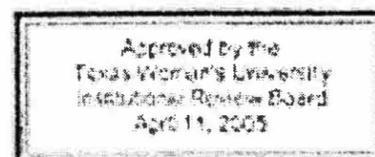
Risk 1: Loss of confidentiality in transcript data and potential loss of confidentiality through all e-mail transactions. Transcript data will be typed and all identifying information will be removed or replaced with a pseudonym or number. Participants will be asked to review the final transcriptions for accuracy. Only the researcher and her faculty advisor will have access to the audio and video tapes. Participants will have the option to have their identity revealed in the final report, as this would acknowledge their contribution to the field. Regardless, their information will be confidential prior to this time, but will be numbered rather than assigned a pseudonym. Participants will also have the right to remain anonymous. All e-mail will be sent via an attachment with instructions not to include any identifying information within the text. E-mail transactions will be protected to the extent possible, given the nature of the medium.

Risk 2: Vulnerability of participants in the interview process. All participants in the study will have the right to eliminate any responses from the interview transcripts at any time, or withdraw participation from the study.

Risk 3: Discomfort. Participants may feel uncomfortable revealing their feelings during the interviews. The interviewer will inform them before beginning that if they are uncomfortable they may stop in the interview at any time and that all information from the present interview will be erased.

Participants will receive transcripts from the interviews to provide them the opportunity to correct any inaccurate information. A summary of the findings will be provided to the participants. Written identifiable data will be destroyed within four years from the time of the interview. Original transcriptions will be shredded and files from the computer will be downloaded to discs which will be destroyed. Audio tapes will be broken and video data will be transferred to CD which will remain locked in a secure storage cabinet and secured on the disc with password protection. Video tape data will not be destroyed as this information cannot be reproduced in any other format.

Page 2 of 3:  
Initials:



If you have any questions about the research study you should ask the researcher; contact information is at the top of this form. If you have questions about your rights as a participant in this research or the way this study has been conducted you may contact the Office of Research and Sponsored Programs at 940-898-3377 or e-mail [irb@twu.edu](mailto:irb@twu.edu).

The researcher will try to prevent any problem that might arise because of this research. You should let the researcher know at once if there is a problem and they will help you. However, TWU does not provide medical services or financial assistance for injuries that might happen because you are taking part in this research.

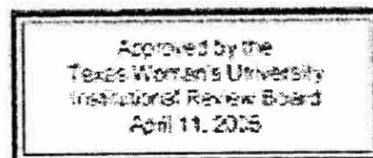
Participation is completely voluntary and you may withdraw at anytime without penalty. If you have any questions, please contact the investigator at the above number. You will be given a copy of this dated and signed consent form to keep.

\_\_\_\_\_  
Signature of Participant

\_\_\_\_\_  
Date

Please provide an address to which the summary should be sent:

\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_





**Institutional Review Board**  
Office of Research and Sponsored Programs  
P.O. Box 425619, Denton, TX 76204-5619  
940-898-3378 Fax 940-898-3416  
e-mail: IRB@twu.edu

November 14, 2005

Ms. Margaret Wilson  
Dept. 3951  
1000 E. University Avenue  
Laramie, WY 82071

Dear Ms. Wilson:

*Re: Reflections on Knowing in the Body - Summarizing Graduate Level Student Responses in  
Special Topics Course: Experiential Anatomy*

The request for an extension of your IRB approval for the above referenced study has been reviewed by the TWU Institutional Review Board (IRB) and appears to meet our requirements for the protection of individuals' rights.

If applicable, agency approval letters must be submitted to the IRB upon receipt PRIOR to any data collection at that agency. A copy of all signed consent forms and an annual/final report must be filed with the Institutional Review Board at the completion of the study.

This extension is valid one year from December 8, 2005. According to regulations from the Department of Health and Human Services, another review by the IRB is required if your project changes in any way. If you have any questions, feel free to call the TWU Institutional Review Board.

Sincerely,

A handwritten signature in black ink that reads 'Rod J. Nichols'. The signature is written in a cursive, slightly slanted style.

Dr. David Nichols, Chair  
Institutional Review Board - Denton

cc. Dr. Penny Hanstein, Department of Performing Arts - Dance

## APPENDIX B

Rond de Jambe Study Publication and Manuscript

## A Three-Dimensional Kinematic Analysis of Grand Rond de Jambe en l'air Skilled Versus Novice Ballet Dancers

Margaret Wilson, M.S., Bee-Oh Lim, Ph.D., and Young-Hoo Kwon, Ph.D.

### Abstract

The purpose of this study was twofold: to perform an in-depth three-dimensional kinematic analysis of grand rond de jambe en l'air en dehors and to identify different strategies employed between the skilled and novice dancers in performing grand rond de jambe. Ten female college dance students, ranked as skilled ( $N = 5$ ) or novice ( $N = 5$ ), performed grand rond de jambe while videotaped for three-dimensional motion analysis in a six-camera setup (60 Hz). Events and phases for the movement were determined to establish a protocol for biomechanic analysis of this movement. Orientation angles of the trunk and pelvis and horizontal and vertical angles of the gesture leg were computed for inter-group comparison. The results of this investigation show differences between skilled and novice dancers in terms of the vertical angle (height) of the gesture leg, horizontal angle of the leg at the transition of pelvic rotation, and increased pelvic motion in all three planes. No significant difference was observed in the trunk motion and orientation. It was concluded that the skilled group secured the required gesture leg motion via a pelvic strategy.

**T**raining for classical ballet dancers is both systematic and rigorous. Beginning with the first class and continuing through a

professional level, dancers complete a daily series of exercises in a set progression that develops and refines the vocabulary of ballet technique. These exercises, which evolve in difficulty and complexity, also develop endurance, range of motion, and motor control. Grand rond de jambe en l'air, a circling of the gesture leg from front to back (or vice versa), is an integral component of classical ballet technique (Fig. 1). This movement is introduced at the barre, but is revisited many times during the center work portion of the class. Rond de jambe is used in almost all styles of dance and its requirement for strength, stability, and flexibility while maintaining the illusion of verticality in the torso is significant. When performed in the center floor component of class or in choreography, the dancer must execute the circular sweep of the leg without the aid of an external source for maintaining balance.

Successful and aesthetically pleasing execution of the grand rond de jambe en l'air includes consistency in leg height, maintenance of a vertical torso, and effortless execution. A dancer develops her technique

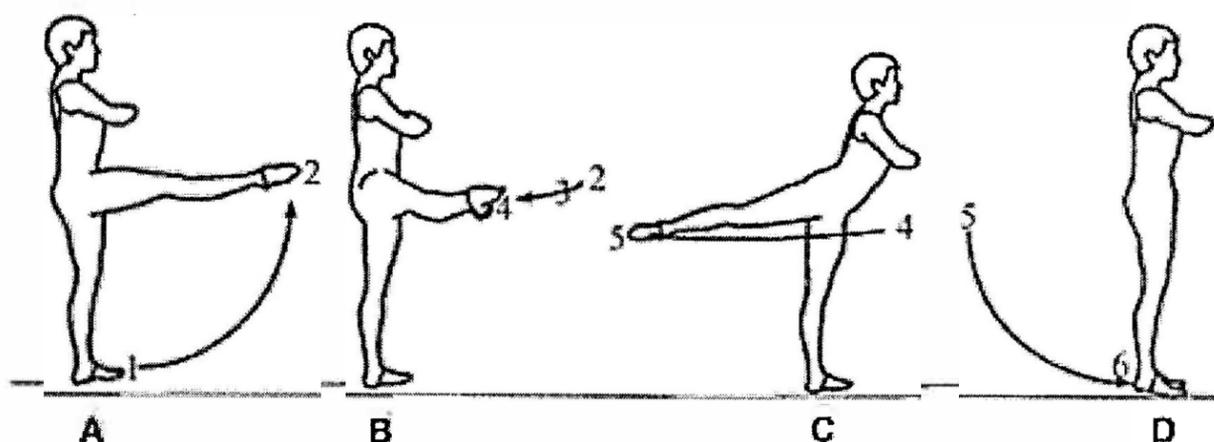
by addressing both the accuracy and artistry of the movement. While varied stylistic preferences for this movement exist within different dance philosophies and schools of ballet, are there common elements in the execution of grand rond de jambe en l'air that develop with training?

During the past two decades, the field of dance science has taken an interest in the physical and mechanical aspects of dance. Biomechanical research in this area has primarily focused on analysis of a particular movement for skilled and non-skilled performers, and the variability between these populations, as well as developing a mechanical understanding of the components of a skill. Most of the research has been conducted on two-dimensional (planar) movements, such as grand battement, passé, arabesque, grand plié and a rapid side kicking movement similar to degagé.<sup>1-6</sup> Only a few studies have analyzed three-dimensional (multi-planar) movements such as pirouette and modified temps lié.<sup>7,8</sup>

While information exists regarding specifics (and generalities) for executing a grand rond de jambe en l'air, to our knowledge, no scientific measurement of this movement has been previously undertaken. An in-depth three-dimensional kinematic analysis of dance movements allows investigators to identify subtle differences in the strategies employed between the skilled and the novice dancers, which

Margaret Wilson, M.S., is in the Department of Dance and the Biomechanics Laboratory at Texas Woman's University, Denton, Texas, and in the Department of Theatre and Dance at the University of Wyoming, Laramie. Bee-Oh Lim, Ph.D., and Young-Hoo Kwon, Ph.D., are in the Biomechanics Laboratory at Texas Woman's University, Denton, Texas.

Correspondence: Margaret Wilson, M.S., Department of Dance, P.O. Box 425708, Texas Woman's University, Denton, Texas 76204-5708.



**Figure 1** Grand rond de jambe en l'air: devant (A), à la seconde (B), arabesque (C), and first position. Devant includes events of IAM (initiation of the ascending motion; 1) and EAM (end of the ascending motion; 2). The movement begins with the opening of the leg from first position (IAM) and the ascending phase in the sagittal plane culminating at EAM. The opening of the leg to the position of à la seconde includes IAPT (initiation of the anterior pelvic tilt; 3) and TRPR (transition of the right pelvic rotation; 4). As the leg begins to travel to the side, anterior pelvic tilt is initiated within the first 10° of horizontal abduction. TRPR defines the slowing of the right pelvic rotation as the leg is carried to à la seconde. The arabesque position corresponds to the maximum height of the gesture leg as well as maximum anterior pelvic tilt. IDM (initiation of the descending motion; 5) marked the beginning of the lowering phase of the leg, and all lowering movement is completed at EDM (end of the descending motion; 6), when the dancer returns to first position.

is often not possible through visual observations. Moreover, development of protocols that analyze multi-planar movements in dance could be used to more clearly understand accepted training practices (i.e., training develops accuracy, artistry and efficiency in movement). The purpose of this study was twofold: to provide a three-dimensional (3-D) kinematic description of grand rond de jambe en l'air en dehors and to identify different strategies employed between the skilled and novice dancers in performing grand rond de jambe. The main research question was whether skilled ballet dancers used different strategies than the novice in the execution of grand rond de jambe en l'air. The analysis in this study focuses specifically on the motion of the pelvis, trunk, and the gesture leg.

### Methods

Ten female students enrolled in the dance program at Texas Woman's University participated in this study. Participants were unanimously identified as skilled ( $N = 5$ ) or novice ( $N = 5$ ) irrespective of the level of class currently enrolled in, by two ballet technique faculty members in consideration of the overall dancing ability or skill, as well as skill in executing grand rond de jambe en l'air at the

barre and in the center floor component (as in an adagio) (Table 1). Each dancer completed a consent form approved by the Institutional Review Board of Texas Woman's University. Testing took place in the Biomechanics Laboratory.

Each participant performed three trials of rond de jambe en l'air en dehors (from front to back) while being videotaped for 3-D motion analysis. A successful trial was determined by the investigators and the participant in terms of smooth execution of the movement without losing balance or exhibiting compensatory movements. The dancers were instructed to perform the rond de jambe with the gesture leg at a 90° angle from the standing leg and torso, while working within their preferred amount of external rotation of the stance leg. The tempo for the exercise was set at 60 beats per minute with a metronome and each trial lasted 12 seconds (only

8 counts were required for the rond de jambe, the first four counts comprised the preparation). Dancers held their arms out to the sides, but brought the hands in to touch the sternum to discourage balancing with the arms and to minimize interference with reflective markers. The dancers completed two practice trials, and then completed the testing. The right leg was used as the gesture leg during the testing; 70% of the participants indicated that this was their preferred leg for this movement. The right leg was chosen as the gesture leg as it is usually the first leg used for gesturing in a traditional ballet class. Selection of the best trial for analysis was based on the consistency of height of the gesture leg throughout the trial, and a stable trial without counterbalancing maneuvers.

Six digital camcorders (Panasonic AG-DVC15) were used in the data collection (picture rate = 60 fps) for

**Table 1** Participant Characteristics

		Mass (kg)	Height (cm)	Age (yrs)	Experience	
					Ballet (yrs)	Dance (yrs)
Skilled ( $N = 5$ )	Mean	53.1	64.2	26.6	9.8	14.4
	(SD)	(4.0)	(1.9)	(7.1)	(6.6)	(9.7)
Novice ( $N = 5$ )	Mean	61.2	65.5	21.2	2.5	4.1
	(SD)	(8.0)	(2.0)	(3.4)	(1.5)	(3.2)

the 3-D video analysis. Reflective markers were placed on the following locations: acromion processes (both sides), sternum, vertebrae (C7, T3, T7, and T12), right and left ASIS (anterior superior iliac spine), and mid-PSIS (posterior superior iliac spine). The gesture leg (right side) had one marker on the anterior aspect of the ankle joint located in the notch midway between the tendons of the anterior tibialis and the extensor digitorum longus. The video data were digitized using the Kwon3D software (Visol, Seoul, Korea; Version 3.1).

The DLT (Direct Linear Transformation) algorithm<sup>9</sup> was used in the camera calibration and in the subsequent 3-D space reconstruction. This algorithm uses the following relationships existing between the real-life coordinates of a marker and its corresponding image plane coordinates for a given camera<sup>9</sup>:

$$u = \frac{L_1x + L_2y + L_3z + L_4}{L_5x + L_6y + L_7z + L_8} \quad (1)$$

$$v = \frac{L_9x + L_{10}y + L_{11}z + L_{12}}{L_{13}x + L_{14}y + L_{15}z + L_{16}} \quad (2)$$

where:

$u$  and  $v$  = image coordinates of the marker;

$x$ ,  $y$  and  $z$  = real-life coordinates of the marker; and

$L_i - L_{16}$  = DLT parameters.

The DLT parameters reflect the camera location and orientation in relation to the global reference frame. Camera calibration is the process of computing the DLT parameters based on a set of control points (markers whose real-life coordinates are already known). A calibration frame with 36 control points was placed in the field of motion for the camera calibration. The reconstructed marker coordinates were subject to digital filtering by a Butterworth 4th-order zero-lag low-pass filter. The cutoff frequency was set at 6 Hz.

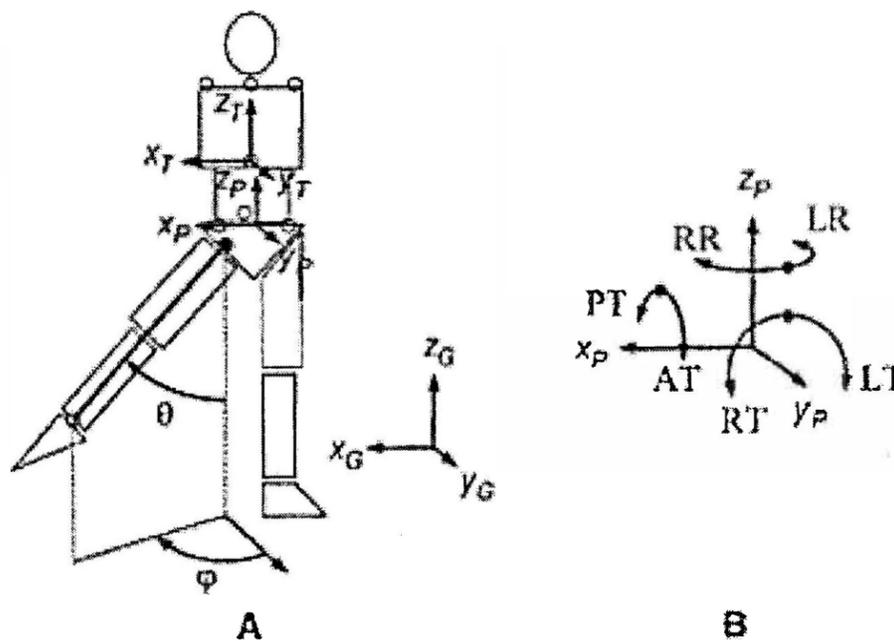
The hip joint center (HJC) of the gesture leg was calculated by using the functional method.<sup>10</sup> The functional method is a numerical

procedure that computes the HJC based on the concentric spherical motions of the leg markers with respect to the HJC, thus allowing personalized HJC computations. The relative position of the HJC to the mid-ASIS point, described in percentage of the inter-ASIS distance, was obtained from the functional trial for each participant.

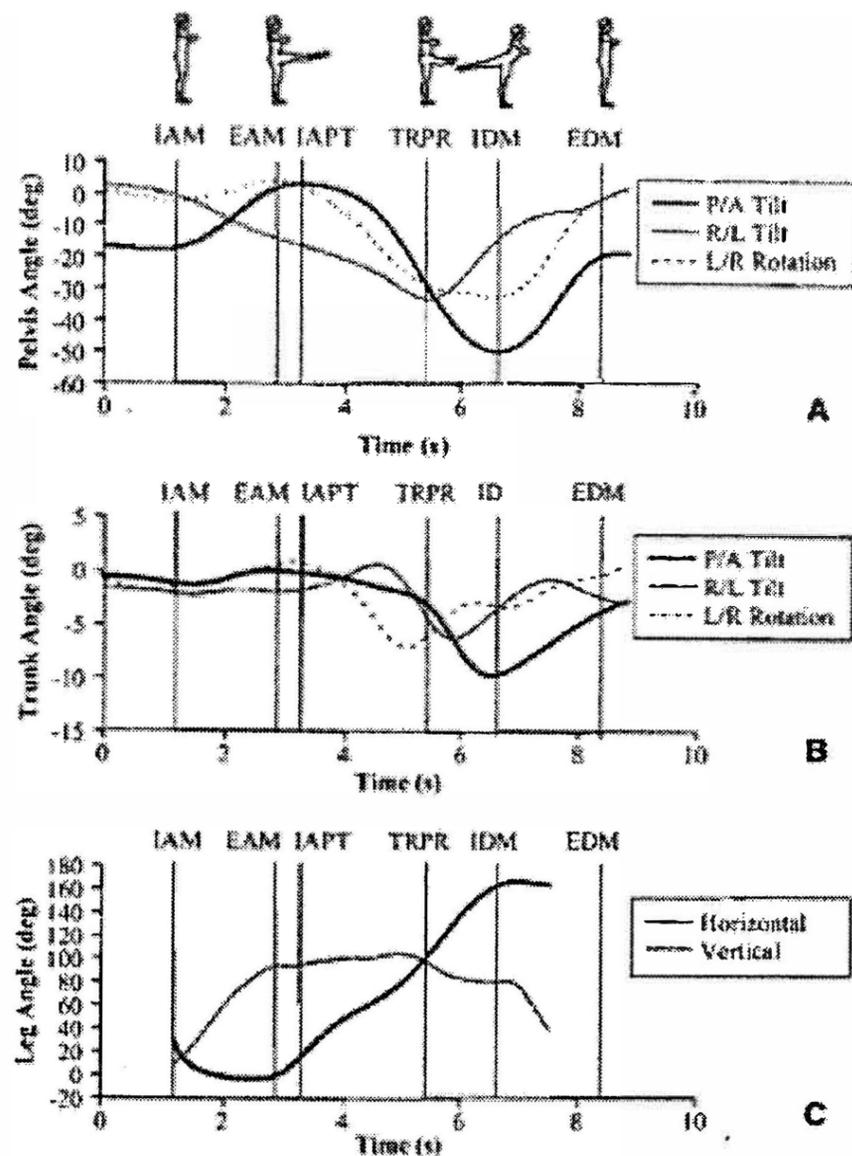
The horizontal and vertical angular orientations of the gesture leg were computed from the right leg vector (line drawn from the right hip joint to the anterior ankle marker) in relation to the global axes (Fig. 2). Local reference frames fixed to the pelvis and trunk were defined to obtain the orientation angles of the segments with respect to the global reference frame fixed to the laboratory (Fig. 2). Both pelvis and trunk provide three different orientation angles

with respect to the global frame, respectively: posterior (+)/anterior (-) tilt, right (+)/left (-) tilt, and left (+)/right (-) rotation. Anterior/posterior tilt of the pelvis occurs in the sagittal plane with the anterior tilt corresponding to the iliac crest tipped forward toward the standing leg. Right/left tilt (obliquity) occurs in the frontal plane; in a left tilt the left ASIS goes lower than the right ASIS. Left/right rotation refers to the movement in the transverse plane; for left rotation, the left ASIS moves posteriorly as the right ASIS moves anteriorly (Fig. 2). Typical orientation angle and leg angle patterns are presented in Figure 3.

Major actions in the gesturing leg and critical transition points of pelvic motion during the horizontal abduction of the leg were defined as events to facilitate the analysis: initiation of the ascending motion



**Figure 2** Reference frames and angles (A), and pelvic motions (B). The pelvis reference frame was defined by three pelvic markers. The line vector drawn from the left ASIS to the right ASIS was used as the mediolateral axis of the pelvis ( $x_p$ ) while the longitudinal axis ( $z_p$ ) was defined perpendicular to the pelvic plane formed by the three pelvic markers. The origin was located at the mid-ASIS point. In the trunk reference frame, the line vector drawn from T12 to C7 was used as the longitudinal axis ( $z_t$ ) while the anteroposterior axis ( $y_t$ ) was defined perpendicular to both the longitudinal axis and the line vector drawn from the left acromion to the right. The origin was at T12. The global frame (G) is fixed to the laboratory. The XYZ rotation sequence was used in the computation of the orientation angles (Euler angles): posterior/anterior tilt (PT/AT), right/left tilt (RT/LT), and left/right rotation (LR/RR). The horizontal angle of the gesture leg ( $\phi$ ) was defined as the angle between the leg plane (the vertical plane that contains the leg line) and the YZ-plane (sagittal plane) of the global frame, while the vertical angle ( $\theta$ ) was defined as the angle between the leg line and the negative Z-axis of the global frame.



**Figure 3** Typical motion patterns of the pelvis (A), trunk (B), and the gesture leg (C) during the grand rond de jambe en l'air (dancer 2, skilled). The signs of the orientation angles are: posterior (+)/anterior (-) tilt, right (+)/left (-) tilt, and left (+)/right (-) rotation. From IAM, left rotation and left tilt develops in the pelvis in the direction of the standing leg. This rotation peaks at the end of the ascending motion (EAM). As the leg begins to open to the side the pelvis begins right rotation with horizontal abduction of the gesture leg. From a la secondé, as the leg moves through horizontal abduction, the vertical angle of the gesture leg is affected, generally decreasing in height until the leg moves to arabesque. The arabesque position corresponds with maximum anterior pelvic tilt (IDM). Pelvis and trunk rotations and tilts decrease as the leg is lowered to the starting position (EDM).

of the gesture leg (IAM), end of the ascending motion (EAM), initiation of the anterior pelvic tilt (IAPT), transition of the right pelvic rotation (TRPR), initiation of the descending motion of the leg (IDM), and end of the descending motion (EDM) (Fig. 1). Among these, IAPT occurs as the gesture leg begins its horizontal abduction, which corresponds to the most posteriorly tilted position of the pelvis (Fig. 3A). TRPR occurs

when the leg nears the a la secondé (side) position showing a change in the right pelvic rotation velocity as seen in the change of slope of the pelvic rotation angle curve. TRPR also coincides with the most left-tilted position of the pelvis (Fig. 3A). IDM corresponds with the maximum anterior tilt of the pelvis and the maximum vertical height of the leg in the arabesque position (Figs. 3A and C).

Horizontal and vertical angles

of the gesture leg and orientation angles of the pelvis at the events were obtained. Pelvic motions were quantified for the anterior and posterior tilts, left and right pelvic tilts, and right and left pelvic rotations. Trunk motions were computed for the anteroposterior tilt, lateral tilt, and the lateral rotation. Two-tailed t-test was used for the comparison between the participant groups. Alpha was set at 0.05 in all statistical analyses.

### Results

Significant differences between the dancer groups were observed in the vertical angle of the gesture leg at EAM, IAPT, TRPR, and IDM, with the skilled group showing group means that exceeded the stipulated 90° angle for the test (Table 2). The novice group means were consistently below 90° for leg height through the entire horizontal abduction phase. A significant difference between groups was observed for the minimum vertical angle of the gesture leg. In both groups, the minimum vertical angle of the gesture leg for all subjects occurred between TRPR and IDM. The skilled group mean exceeded the novice group, although the minimum vertical leg angle for both groups was smaller than those observed at EAM, IAPT, and TRPR (Table 3).

The skilled group showed a significantly greater horizontal angle of the gesture leg at TRPR (Table 2). The novice group was characterized by a significantly smaller horizontal angle at TRPR as well as a larger standard deviation for this measure (SD-to-mean ratio: 4.4% for the skilled vs. 32.2% for the novice).

Significant inter-group differences were observed for posterior pelvic tilt (IAM to EAM), left pelvic tilt (IAM to EAM), and anterior pelvic tilt (IAPT to IDM), with the skilled group showing more pelvic motions (Table 3). While no significant difference was observed for right pelvic tilt (TRPR to IDM) or the

**Table 2** Summary of the Gesture Leg Angles (degrees)

		Vertical					Horizontal		
		EAM	IAPT	TRPR	Min	IDM	IAPT	TRPR	IDM
Skilled	Mean	95.6†	97.1†	95.5†	80.9†§	98.9†	8.5	100.0†	170.2
(N = 5)	(SD)	(4.9)	(4.7)	(5.4)	(4.3)	(4.3)	(7.2)	(4.4)	(6.1)
Novice	Mean	84.3	85.9	85.9	65.6§	87.0	8.6	64.6	165.5
(N = 5)	(SD)	(3.4)	(4.7)	(6.5)	(9.9)	(5.8)	(7.4)	(20.8)	(3.4)

†Significantly different from the novice group ( $p < .05$ ); § Significantly smaller than other events ( $p < .05$ ).

**Table 3** Summary of the Pelvic Motions (degrees)

		PT	AT	LT	RT	LR	RR
Skilled	Mean	22.8†	65.7†	30.7†	22.3	14.4	46.7
(N = 5)	(SD)	(2.6)	(8.2)	(3.5)	(2.9)	(8.1)	(11.5)
Novice	Mean	15.8	50.8	20.9	16.3	12.7	39.0
(N = 5)	(SD)	(5.3)	(3.8)	(5.1)	(8.0)	(3.6)	(3.3)

†Significantly different from the novice group ( $p < .05$ ); Abbreviations: PT, posterior tilt; AT, anterior tilt; LT, left tilt; RT, right tilt; LR, left rotation; and RR, right rotation.

left (IAM to EAM) and right (EAM to IDM) pelvic rotations, the skilled group exhibited a trend of larger mean values.

The orientation angles of the pelvis revealed significant inter-group differences (Table 4). The skilled dancers showed a more posteriorly-tilted position at IAPT, and more anteriorly-tilted, left-tilted, and right-rotated positions at TRPR than the novice group. The skilled group was also characterized by more anteriorly-tilted position at IDM.

No significant inter-group difference was observed in the trunk motions. Although not significant, the skilled group showed a trend of slightly less lateral tilt and lateral rotation than the novice group (Table 5).

**Discussion**

The most notable finding from this investigation was that the skilled

group showed greater motion in the pelvis during the execution of the grand rond de jambe en l'air. On the average, the skilled group showed 7.0° more posterior pelvic tilt, 14.9° more anterior tilt, and 6.1° more left tilt than the novice group (Table 3). The anterior tilt (IAPT to IDM) was identified as the dominant pelvic motion in the grand rond de jambe en l'air (65.7° and 50.8° for the skilled and novice group, respectively), followed by the left tilt (IAPT to TRPR; 30.7° vs. 20.9°) (Table 3 and Figure 3). The overall inter-group difference in the anteroposterior pelvic tilt was 21.9° while that in the anteroposterior trunk tilt was 3.8°. Both groups were moving the pelvis in response to the action of the leg, but the skilled group showed a greater degree of pelvic motion.

The vertical leg angle (gesture leg height) appeared to be relatively consistent for both groups

from EAM to TRPR (devant to à la seconde) ( $SD \leq 6.5^\circ$ ; Table 2) and the skilled dancers maintained a greater vertical angle ( $> 90^\circ$ ; Table 2). This was somewhat expected, as dancers with more training would have developed greater strength and flexibility to support their range of motion. However, it appears that the skilled dancers actually employed a different movement strategy, specifically using the pelvis to facilitate a greater range of motion of the leg (pelvic strategy). For example, at TRPR the skilled group assumed a significantly more right-rotated pelvis position (Table 4). In fact, right rotation of the pelvis was almost completed by the time the skilled dancers reached the TRPR position. Only 3.4° of right rotation was further achieved between TRPR and IDM in the skilled group as compared to the 17.3° of the novice group. A significantly more right-rotated pelvic orientation at TRPR alone could provide for a significantly larger horizontal angle of the gesture leg at TRPR.

A greater gesture leg angle (from IAPT to IDM) also appeared to be maintained by the range of pelvis motion in the skilled group; the skilled dancers showed greater posterior pelvic tilt as the leg was brought to IAM from EAM.

**Table 4** Summary of the Pelvis Orientation Angles (degrees)

		IAPT			TRPR			IDM		
		PTed	LTed	LRed	ATed	LTed	RRed	ATed	LTed	RRed
Skilled	Mean	9.2†	17.8	10.5	31.6†	32.9†	31.4†	56.5†	10.6	34.8
(N = 5)	(SD)	(4.4)	(2.5)	(7.7)	(5.1)	(2.2)	(3.9)	(4.6)	(4.0)	(5.8)
Novice	Mean	1.2	16.5	8.5	15.4	25.2	12.7	49.7	9.0	30.0
(N = 5)	(SD)	(3.6)	(2.8)	(2.7)	(12.3)	(5.6)	(8.7)	(3.9)	(4.5)	(3.8)

†Significantly different from the novice group ( $p < .05$ ); PTed, posteriorly tilted; ATed, anteriorly tilted; LTed, left tilted; LRed, left rotated; and RRed, right rotated. (Note: there is no measure of AT at IAPT and no measures of PT at TRPR or IDM.)

**Table 5** Summary of the Trunk Motions (degrees)

		APT	LT	LR
Skilled (N = 5)	Mean	18.2	6.7	14.3
	(SD)	(8.2)	(0.7)	(7.9)
Novice (N = 5)	Mean	14.4	8.3	15.9
	(SD)	(3.3)	(4.1)	(3.6)

APT, anteroposterior tilt; LT, lateral tilt; and LR, lateral rotation.

This posterior tilt accompanied by a left tilt can orient the joint socket more anteriorly and allow for greater range of motion in the ascending leg. (The hip joint socket is inferiorly tilted about 35° and anteverted about 21.5° in women.<sup>11</sup>) Increased anterior and left tilts accompanied by large right rotation of the pelvis from EAM to TRPR can successfully carry the gesture leg through the à la seconde position without any major effort to increase the hip range of motion. More anteriorly and left-tilted, and a more right-rotated position of the pelvis in the skilled group at TRPR may have functioned to orient the hip socket more laterally and posteriorly. This would be advantageous for resisting the internal rotation of the gesture leg with no substantial loss of height. Delayed internal rotation of the thigh at TRPR using large pelvic motion seems to be a key feature of the pelvis strategy employed by the skilled dancers. Thus larger horizontal and vertical leg angles at TRPR observed in the skilled group may not necessarily be attributed to the higher flexibility at the hip joint. In other words, the goal of the pelvic motion seen with the skilled dancers could be to place the gesture leg relative to the pelvis for the vertical and horizontal requirements of the movement.

Among the events, TRPR appeared to be the critical event which differentiates the skilled from the novice. Significant inter-group differences were observed at TRPR in all gesture leg and pelvis orientation variables (Tables 2 and 4). The novice group was characterized by larger variations (SD) in the horizontal angle of

the gesture leg and the orientation angles of the pelvis at this event.

Another major finding is that no significant inter-group difference was observed in the trunk motion in the execution of the grand rond de jambe en l'air (Table 4). The skilled group even showed a tendency of less lateral tilt and rotation of the trunk. It is evident from these observations that the skilled group successfully maintained the trunk orientation by localizing the pelvic motion. The skilled dancers seemed to be using a rotation strategy between the upper and lower torso to maintain the aesthetic requirement of verticality. Thus, for the skilled group, as the pelvis undergoes left rotation from IAM to EAM and right rotation from EAM to IDM, the trunk maintains its orientation to the front. When discussing the lateral tilt of the pelvis that occurs when the gesture leg is lifted to 90°, Greig<sup>12</sup> notes that movement of the pelvis is not emphasized ("disguised") as the dancer maintains a vertical orientation of the thoracic spine. This vertical orientation was seen for both groups in this study.

Since this study is the first 3-D kinematic study of grand rond de jambe en l'air, no directly comparable set of data exists. In a study of arabesque, a component of grand rond de jambe en l'air, Bronner and colleagues demonstrated differences between skilled, intermediate, and beginning level dancers.<sup>3</sup> While the general appearance ("shape and organization") was the same for the three levels, the expert dancers demonstrated mastery of both the postural and positional requirements. The investigators cited trunk control as a key in distinguishing skilled from beginner

performance on this measure. In addition, Mouchino and associates<sup>6</sup> found that dancers use a translation strategy for balance in response to a rapidly moving leg to the side. This strategy is similar to the localized pelvis motion of the skilled group in the present study.

Literature related to the teaching of ballet technique discusses the inevitable displacement of the pelvis when the gesture leg moves above 90° with the leg à la seconde. Paskevaska<sup>13</sup> noted that this movement should be the result of the action of the leg, not a movement of the pelvis in anticipation. Warren<sup>14</sup> suggested that care should be taken to prevent the hip from lifting and the upper body from tilting away from the gesture leg in the movement à la seconde to arabesque. These two investigators acknowledged a gratuitous pelvic motion, but advised minimizing its contribution. In Balanchine technique, the training modality of the New York City Ballet Company, a more open pelvis is emphasized to facilitate maximum range of movement of the leg. Schorer<sup>15</sup> described this action as a "release to the degree necessary to maintain the turn out as the leg passes to the back." In Balanchine's method, the clarity of the position of the leg is more important than keeping the hip "perfectly placed." Anatomically there is a limited range of pure leg movement at the hip, (45° to 65° degrees lateral flexion in frontal plane),<sup>11,12</sup> thus the onset and the complicity of the pelvic movement seems to be a key element in both the skill and the elegance of grand rond de jambe en l'air.

The geometric design of ballet vocabulary requires specific spatial requirements for the execution of a step such as grand rond de jambe en l'air. It appears that this is facilitated by the localization of the movement in the pelvis in coordination with the hip joint of the standing leg, which serves as the pivot point for the pelvis-gesture leg interaction while maintaining verticality in the

upper body. In the present study, the novice group maintained similar vertical alignment of the trunk as the skilled group but demonstrated a smaller gesture leg vertical angle and pelvic motion. It seems unlikely that the novice group in this study would have been able to maintain verticality and balance if they were to match the 90° requirement for the vertical angle of the leg.

It has been shown that there is a distinct difference in the movement pattern between the skilled and the novice, especially in the pelvis motion. The remaining questions, however, are why the skilled dancers demonstrated more pelvic motion and what keeps the novice dancers from employing the same strategy. One likely answer to the first question is that the skilled dancers employ a pelvis strategy to increase the range of motion of the leg. This could be tested by asking the skilled dancers to perform multiple trials of *rond de jambe en l'air* with varying difficulties (vertical angle requirements) while monitoring pelvic range of motion. The onset of the pelvic motion can be determined through motion analysis. While a greater range of motion (external rotation, abduction, and extension) can be attributed to training,<sup>16</sup> the strategy to negotiate the pelvic orientation with the vertical angle requirement of the gesture leg plays an important role. Future research within this protocol should include an analysis of gesture leg range of motion at the hip.

In regard to the second question, perhaps the novice group shows insufficient muscle strength for the required movement. The ascending motion of the leg with a more externally rotated thigh and maintenance of this position until TRPR is reached requires a complex recruitment of hip joint muscles (flexors, abductors, adductors, and external rotators). Insufficient muscle strength may prohibit the novice dancers from executing certain types of movements and achieving specific leg height. The

novice group in this study demonstrated greater variability in the measure of horizontal abduction relative to the pelvis orientation at TRPR. This variability in novice dancers has been seen in other studies.<sup>2,3,8</sup> Future research within this context will include measurement of core muscle strengths and in-depth analysis of the muscle activations, as well as a consideration of the pelvic action in relation to the standing leg.

Skilled dancers can produce an accurate representation of the desired movement in *grand rond de jambe en l'air*, and part of this ability may be due to an increased movement in the pelvis. The skilled dancers in this investigation were clearly exhibiting more pelvic motion, although none were obviously lifting their hip. While the results from this study discuss the pelvic motion as a "strategy," the nuances of this implication need to be explored. Dance teachers admonish their students not to "lift their hip" as the leg moves to the side, however, what this means in a practical sense perhaps cannot be contained in a simple description. Whether the dancers in this investigation were indeed using the pelvis to facilitate the gesture limb movement, or in fact allowing the natural motion of the pelvis to occur cannot be determined from the mechanical analysis alone, but warrants both further investigation and discussion. While the scope of this study was narrowed to focus on the movement of the pelvis and trunk, the authors acknowledge that differences in pedagogical and stylistic variations undoubtedly must be accounted for.

This study provides kinematic profiles of the pelvis and trunk motion in *grand rond de jambe en l'air*. At this point, however, the kinematic profiles and main findings are limited to this particular population (college age dancers within a liberal arts institution, N = 10). While all of the participants were enrolled in a ballet class at the

same institution, their prior experience and length of time training was varied.

### Conclusions

Descriptive kinematic data of *grand rond de jambe en l'air* (specifically, pelvis, trunk, and gesture leg motions) were obtained in this study through a 3-D motion analysis, which will serve as the baseline data for the future studies. A protocol for the 3-D kinematics analysis was established and events and phases for quantitative analysis were also identified. It was concluded from the findings that a distinct difference in the movement pattern between the skilled and the novice exists in executing *grand rond de jambe en l'air*, that the skilled group was characterized by greater pelvis motion throughout the entire movement phase while maintaining the trunk orientation (pelvis strategy), and the transition of the right rotation (or maximally left-tilted pelvis position) was identified as the critical event that differentiates the skilled from the novice.

While the findings from this study provide insight into the 3-D kinematics of *grand rond de jambe en l'air*, further studies are necessary to distinguish: the optimal relationship of the pelvis to the gesturing leg in *grand rond de jambe en l'air*, the optimal relationship of the pelvis to the standing leg, and the role (facilitation or inhibition) of the barre in developing the pelvis strategy.<sup>17</sup>

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**Contribution of the Pelvis to Gesture Leg Range of Motion in a Complex Ballet Movement: *Grand Rond de Jambe en l'air en Dehors***

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## ABSTRACT

Eight skilled ballet dancers performed grand rond de jambe en l'air with the right leg as gesture leg at heights of 90, 105 degrees as well as their maximal active range of motion (MAR). 3-D motion analysis was performed to quantify the pelvis and gesture-leg motions and to investigate the interaction between pelvic motion and increased leg height. Orientation angles of the pelvis and relative orientation angles of the gesture leg to the pelvis were computed. Events for analysis were defined based on the gesture leg motion, and the pelvis and gesture leg orientation angles at these events as well as the peak values were obtained. One-way repeated-measure ANOVA was used to determine differences among leg heights ( $p < .05$ ). In grand rond de jambe of 90° or higher, dancers gradually increased pelvic motion, especially anterior/posterior and lateral tilts, as the height increased. Approximately 4 to 16% of the leg height at end of the ascending motion and 60% of the leg height at initiation of the descending motion were explained by posterior and anterior pelvic tilt, respectively. Maximum left lateral pelvic tilt was equivalent to approximately 45 to 60% of the maximum hip abduction. As the height increased dancers achieved the required leg height primarily by increasing the pelvic motion. Gesture leg motion revealed only a minor contribution. In spite of literature in dance pedagogy which suggests that the pelvis should remain immobile during grand rond de jambe, the authors conclude that the pelvis is the primary contributor to the gesture leg range of motion for increased vertical angle demands.

## Introduction

Ballet dancing is a complex activity that requires precision in position, action, timing and sequencing of movements. The training of a dancer is tutored under the watchful eye of an instructor, who works within specific aesthetic and stylistic elements. In contrast, three-dimensional (3-D) analysis of ballet movement reveals subtle variations in performance capacities of dancers, which ultimately lead to a better understanding of the physical requirements of this art form. While dancers and dance teachers have keen eyes for detail during complex movements, motion analysis provides for comprehensive quantitative analysis of complex dance movements by observing interdependent series of segment/joint motions, which can be separately analyzed for a clearer understanding.<sup>1-7</sup>

*Grand rond de jambe en l'air en dehors* is an integral part of ballet vocabulary and requires considerable skill, flexibility and strength for seemingly effortless performance. In this action, the moving or gesture leg flexes to 90 degrees or higher in the hip joint in the sagittal plane and creates a half circle from front to back, or from “*quatrième devant à la hauteur* through [the position] *à la seconde hauteur*, and [around to] *quatrième derrière à la hauteur*”.<sup>8</sup> Described analytically, grand rond de jambe represents a family of movement in which one leg supports the body and the other leg performs the gesture. The body can be divided into four units in this action: the supporting leg, gesture leg (as the one showing the key movement), pelvis (as the facilitator for the gesture leg motion and balance), and the rest of the body. The pelvis is the point of convergence for the other three units. In *grand rond de jambe en l'air en dehors*, the gesture leg motion could be described as the sum of the pelvic motion and the

gesture-leg hip joint motion.

The amount of movement in the pelvis has been a topic of divergent discussion among dance practitioners, educators, and scientists.<sup>9-11</sup> While many educators and dancers feel that tipping the pelvis is necessary to accommodate the increased height of the gesturing leg, the directive given in technique class is that the pelvis should remain immobile, to minimize excess motion. Discussion regarding how much the pelvis should move, or facilitate range of motion in the gesturing leg, centers around aesthetic values in different dance genres, especially in classical ballet. However, the amount of pelvic motion required, or allowed, has received little attention in the dance medicine and science literature.

In a 3-D kinematic study of novice and skilled dancers performing *grand rond de jambe en l'air*, Wilson, Lim & Kwon<sup>1</sup> showed that skilled dancers demonstrated more pelvic movement than their unskilled counterparts. Two possible explanations were offered for these findings: (a) Skilled dancers may use more pelvic motion to increase the range of motion of the gesture leg; (b) Novice dancers may use less pelvic motion because increasing the pelvic motion (and gesture leg height as a result) would require more muscular strength and effort. Further analysis and quantification of pelvic motion and gesture-leg hip motion at different leg heights would confirm the first explanation offered by Wilson, et al<sup>1</sup> and provide a clearer answer to the controversy.

The purpose of this study was to investigate the contribution of the pelvic motion to gesture leg range of motion in *grand rond de jambe en l'air en de hors* with different vertical angle levels. Two hypotheses were tested:

- Skilled dancers would maintain pelvic range of motion as the leg height demand increases.
- Skilled dancers would maintain gesture leg hip range of motion as the leg height demand increases.

### Methods

Eight experienced female ballet dancers participated in this study. Six participants were from a collegiate dance program and two from a professional ballet company. The mean length of professional or high-level dance training was 10.2 years (SD = 5.92 years) (Table 1). The right leg was the gesture leg for all participants. Ethics approval was obtained and all participants signed consent forms approved by the University IRB prior to the data collection.

**Table 1: Participant Characteristics**

	Mean	SD	Range
Mass (kg)	53.1	3.3	49.1 – 58.2
Height (cm)	163.4	4.1	155.0 – 170.0
Age (yrs)	26.7	7.7	19.0 – 38.0
Dance Career (yrs)*	10.2	5.9	3.5 – 17.0

\* Includes all dance training

A 3-D motion analysis was performed to quantify the pelvis and gesture-leg motions. Reflective markers were placed on the participant's body (Figure 1). The joint centers were located based on the surface markers. The mid-point of the malleolus

markers was used as the ankle joint center, whereas that of the epicondyle markers was used as the knee joint center. A functional method was used to locate the hip joint center.<sup>1, 12</sup>

Motion data was captured using six digital video camcorders (Panasonic AG-DVC15; picture rate = 60 Hz; shutter speed = 1/1000 s). The video data was digitized using the Kwon3D software (Visol, Seoul, Korea; Version 3.1). A calibration frame with 36 control points was placed in the field of motion for the camera calibration. The DLT algorithm<sup>1, 13</sup> was used in the camera calibration and subsequent 3D space reconstruction. The reconstructed marker coordinates were subject to numerical filtering by a Butterworth 4<sup>th</sup>-order zero-lag low-pass filter (cutoff frequency = 6 Hz).

In addition to the inertial global reference frame fixed to the laboratory, two non-inertial local reference frames were defined based on the markers and the joint centers: pelvis and gesture leg (Figure 2). The relative orientation of the pelvis frame to the global frame and that of the gesture leg frame to the pelvis frame were computed to quantify the pelvis (anterior tilt, posterior tilt, left lateral tilt, left rotation, and right rotation) and the gesture-leg hip (flexion, hyperextension, abduction, and external rotation) motion. Orientation angles were computed based on the mediolateral-anteroposterior-longitudinal axis rotation sequence.<sup>1</sup> The vertical angle (V) and horizontal angle (H) of the gesture leg were also computed.<sup>1</sup>

The dancers were asked to warm up for a minimum of 5 minutes prior to testing, and encouraged to keep moving between trials. Each participant executed *grand rond de jambe en l'air* at three different vertical angles: 90°, 105°, and Maximum Active Range

of Motion (MAR). A visual guide was placed in front of the dancer to show the target height for the 105-degree condition (Figure 3).

Each dancer completed a minimum of two trials per angle condition. To standardize the trials, each was performed to the same music (Lisa Harris, *Etudes for Ballet Class*, 4/4 adagio) and each trial lasted for twelve counts, eight counts for the full grand rond de jambe en l'air and four counts for a rise to half pointe (relevé) and lowering (abaissé) at the end. For the analysis, one trial from each height was chosen for analysis. Criteria for selection included smooth movement of the leg, maintenance of balance, lack of counter movement in the body, and synchronization with the music.

Events were defined based on the gesture leg motion: end of ascending motion (EAM), maximum vertical leg angle (MXV), minimum vertical leg angle (MNV), transition (TR; identified relative to a marked change in gesture leg rotation<sup>1</sup>), and initiation of descending motion (IDM) (Figure 4). The dependent variables were the pelvis and gesture leg orientation angles at the events and the peak values: anterior pelvic tilt (AT), posterior pelvic tilt (PT), left lateral pelvic tilt (LT), left pelvic rotation (LR), right pelvic rotation (RR), hip flexion (FL), hip hyperextension (HE), hip external rotation (ER), and hip abduction (AB) (Figure 4). One-way repeated-measure ANOVA was used to determine differences among leg height conditions ( $p < .05$ ). Post-hoc tests were conducted with the Bonferroni adjustment.

## Results

Among the gesture leg motion-related events, significant differences in leg height among testing conditions were observed at MXV, TR, MNV, and IDM (Table 2). The

105° and MAR conditions showed significantly larger vertical leg angle values than the 90° condition in these events. The MAR condition was also characterized by significantly larger vertical leg angle values than the 105° condition in these events. At EAM, only the 105° condition revealed a larger mean value than the 90° condition.

**Table 2: Vertical Leg Angles (degrees; N = 8)**

Event	90° (Mean ± SE)	105° (Mean ± SE)	MAR (Mean ± SE)
EAM	90.1 ± 2.2	99.3 ± 1.9 <sup>§</sup>	101.9 ± 2.9
MXV	94.8 ± 1.9	106.8 ± 2.0 <sup>§</sup>	116.6 ± 3.2 <sup>§†</sup>
TR	80.3 ± 2.1	93.0 ± 2.5 <sup>§</sup>	100.4 ± 2.6 <sup>§†</sup>
MNV	76.7 ± 1.6	86.1 ± 1.7 <sup>§</sup>	94.2 ± 2.8 <sup>§†</sup>
IDM	84.0 ± 2.9	95.1 ± 2.5 <sup>§</sup>	105.9 ± 3.4 <sup>§†</sup>

<sup>§</sup> Significantly different from the 90° condition ( $p < .05$ ); <sup>†</sup> Significantly different from the 105° condition ( $p < .05$ ); Event abbreviations: EAM, end of ascending motion; MXV, maximum vertical angle; TR, transition; MNV, minimum vertical angle; IDM, initiation of descending motion.

Significant differences among the testing conditions were observed in the peak pelvic orientation angles (Table 3). The 105° and MAR conditions showed significantly larger maximum posterior tilt (PTmax), left lateral tilt (LTmax), and anterior tilt (ATmax) than the 90° condition. The MAR condition was also characterized by a significantly larger LTmax than the 105° condition. In addition, significant inter-condition differences were observed at EAM (PT: 90° < 105° < MAR; LR: 90° < MAR), MXV (LT: 90° < 105° < MAR), MNV (AT: 90° < 105°; RR: 90° < MAR), and IDM

(AT: 90° < 105°, MAR).

**Table 3: Pelvis Orientation Angles (degrees; N = 8)**

<b>Pelvic Motion</b>	<b>90° (Mean ± SE)</b>	<b>105° (Mean ± SE)</b>	<b>MAR (Mean ± SE)</b>
PTmax	4.3 ± 2.0	13.6 ± 1.8 <sup>§</sup>	17.3 ± 1.8 <sup>§</sup>
LTmax	25.7 ± 1.6	31.5 ± 0.9 <sup>§</sup>	38.1 ± 1.0 <sup>§†</sup>
ATmax	51.2 ± 2.1	58.8 ± 1.6 <sup>§</sup>	65.5 ± 2.4 <sup>§</sup>
PT at EAM	3.7 ± 1.9	11.6 ± 1.1 <sup>§</sup>	16.2 ± 1.8 <sup>§†</sup>
LR at EAM	7.1 ± 1.6	10.3 ± 2.1	12.8 ± 1.6 <sup>§</sup>
(LTmax)			
LT at MXV	20.3 ± 1.9	25.1 ± 1.0 <sup>§</sup>	34.1 ± 1.8 <sup>§†</sup>
AT at MNV	45.7 ± 2.9	52.6 ± 1.8 <sup>§</sup>	54.7 ± 3.4
RR at MNV	30.6 ± 2.3	37.4 ± 1.9	39.8 ± 2.5 <sup>§</sup>
AT at IDM	50.2 ± 2.1	57.4 ± 1.7 <sup>§</sup>	63.9 ± 2.6 <sup>§</sup>

<sup>§</sup> Significantly different from the 90° condition (p < .05); <sup>†</sup> Significantly different from the 105° condition (p < .05); Abbreviations: PT, posterior tilt; LT, left lateral tilt; AT, anterior tilt; LR, left rotation; RR, right rotation; Event abbreviations: EAM, end of ascending motion; MXV, maximum vertical angle; MNV, minimum vertical angle; IDM, initiation of descending motion.

For the gesture leg motion variables, only the maximum abduction (ABmax) showed significant inter-condition difference (Table 4). The 105° and MAR conditions revealed significantly larger ABmax values than the 90° condition. In addition, significant inter-condition differences in the leg orientation were observed at MXV (ER: 90° > MAR) and IDM (AB: 105° < MAR; ER: 90° < MAR).

**Table 4: Thigh Orientation Angles (degrees; N = 8)**

<b>Hip Motion</b>	<b>90°</b>	<b>105°</b>	<b>MAR</b>
	<b>(Mean ± SE)</b>	<b>(Mean ± SE)</b>	<b>(Mean ± SE)</b>
ABmax	56.4 ± 1.5	60.6 ± 1.4 <sup>§</sup>	62.8 ± 1.9 <sup>§</sup>
ER at MXV	32.5 ± 4.1	25.7 ± 4.1	18.5 ± 3.4 <sup>§</sup>
AB at IDM	17.4 ± 2.2	19.3 ± 2.8	22.4 ± 2.8 <sup>†</sup>
ER at IDM	36.6 ± 2.5	39.7 ± 3.4	41.1 ± 2.7 <sup>§</sup>

<sup>§</sup> Significantly different from the 90° condition ( $p < .05$ ); <sup>†</sup> Significantly different from the 105° condition ( $p < .05$ ); Abbreviations: AB, abduction; ER, external rotation; Event abbreviations: MXV, maximum vertical angle; IDM, initiation of descending motion.

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### **Discussion**

Most of the dancers in this study had sufficient skill to demonstrate differences in gesture leg height according to the vertical angle requirements (Table 2). The mean differences in the vertical leg angle between the 90° and the 105° condition and between the 105° condition and the MAR condition were 10.9° and 7.7°, respectively. Although the differences were not incremental, a reasonable separation between the 105° and the MAR condition was achieved. In general, fewer inter-condition differences in the pelvis and gesture leg motion were observed between the 105° and the MAR condition than between the 90° and the 105° condition (Tables 3 and 4).

Dancers maintained the gesture leg higher than the prescribed level at EAM and MXV only in the 90° condition, and at MXV only in the 105° condition. A fairly large fluctuation in the vertical leg angle throughout the trial (EAM to IDM) was observed: 18.1°, 20.7°, and 22.4° for the 90°, 105°, and MAR condition, respectively. Both the

maximum and minimum vertical leg angles increased consistently as the leg height demand increased (Figure 5), whereas the fluctuation also revealed a trend of increase: 18.1° to 20.7° to 22.4°.

Among the pelvis and gesture hip motion variables, LPmax, PTmax, ATmax, and ABmax revealed significant inter-condition differences (Tables 3 and 4). Although these variables exhibited linear trends of increase as the leg height demand increased (Figure 5), the differences in the PTmax, ATmax, and ABmax between the 105° condition and the MAR condition were not significant due to relatively small mean differences (PTmax and ABmax) or relatively large standard errors (ATmax and ABmax). In *grand rond de jambe*, posterior pelvic tilt and gesture leg hip flexion make the greatest contribution to the gesture leg height near the EAM, while anterior pelvic tilt and hip hyperextension have the greatest contribution near the IDM (Figure 4). The posterior pelvic tilt at EAM was equivalent to approximately 4.1%, 11.7%, and 15.9% of the vertical leg angle for the 90°, 105°, and MAR conditions, respectively, while the anterior pelvic tilt at IDM was equivalent to approximately 59.8%, 60.4%, and 60.3%, respectively (Tables 2 and 3). Left lateral pelvic tilt and hip abduction are the main contributors to the gesture leg height when the horizontal angle is close to 90° (*à la seconde* position) and maximum left lateral pelvic tilt was approximately 45.6%, 52.0%, and 60.7% of the maximum hip abduction for the three conditions, respectively (Tables 3 and 4).

The non-significant difference in the vertical leg angle at EAM between the 105° and the MAR condition (Table 3) appeared to be the main cause of the non-significant

difference in the maximum posterior tilt. Relatively large standard errors in the vertical leg angle and anterior pelvic tilt near the IDM (Tables 2 and 3) suggested an interaction between the anterior pelvic tilt and hip hyperextension. No significant inter-condition difference in the hip flexion and hyperextension was observed at any event throughout the entire horizontal motion of the leg (EAM to IDM) (Table 4), suggesting that dancers relied more on the anterior and posterior pelvic tilt than the hip flexion and hyperextension to increase the gesture leg height. The maximum left lateral pelvic tilt, on the other hand, showed significant changes across all the experimental conditions while the maximum abduction revealed non-significant difference between the 105° and the MAR condition (Tables 3 and 4). The left lateral pelvic tilt pattern was characterized by larger inter-condition differences over the hip abduction pattern: 5.8° vs. 4.2° from the 90° to the 105° condition; 6.6° vs. 2.2° from the 105° to the MAR condition. This trend suggests that as the leg angle approached to the maximum active range of motion, dancers relied more on the left lateral pelvic tilt than the hip abduction to increase the leg height in the *à la seconde* position.

Range of motion at the hip can be limited by femoral anteversion, low extensibility of the ligaments, orientation of the acetabulum and femoral neck as well as the flexibility and strength of the muscles and tendons crossing the hip.<sup>14, 15</sup> Once the hip joint range of motion has been completed, additional movement of the thigh must be accommodated in the pelvis.

In a kinematic study of *grand rond de jambe* by Wilson et al.<sup>1</sup> skilled dancers demonstrated more pelvic motion and achieved (and even exceeded) the prescribed

height measure. From these findings, it was proposed that the skilled dancers were utilizing a pelvis strategy to facilitate the vertical angle of the leg. The mean leg heights (the mean of four events: EAM, TR, MNV, and IDM) of the skilled and the novice group in Wilson et al.'s 2004 study were 92.5° and 80.7° (mean difference = 11.8°), respectively, while the corrected values from the current study for comparison were 93.4° and 82.8° (mean difference = 10.6°) for the 105° and the 90° condition, respectively. (Corrected means the value is the mean of four events rather than the five used in the 2004 study) (Table 2). The skilled and the novice group in Wilson et al.'s study showed slightly smaller but similar values when compared to the 105° and the 90° condition of the current study, respectively. The maximum posterior and anterior tilt angles showed comparable mean inter-group differences (8.0° and 6.8°, respectively, between the skilled and the novice group, and 9.3° and 7.6°, respectively, between the 105° and the 90° condition). The difference in the pelvic motion between the dancer groups (skilled vs. novice) could be explained a great deal by the difference in the vertical leg height. These findings support the notion that a pelvis strategy can be used to increase the gesture leg height regardless of the skill level of the dancers.

The implications from the findings of the current study are important in terms of understanding how the pelvis contributes to the leg action. However, the role of the pelvis is not limited to the gesture leg only. In a complex movement such as *grand rond de jambe*, the pelvis is the convergence point of the body parts and may contribute to maintaining balance on the standing leg while providing support for the upper body. While the difference in the magnitude of pelvic motion between the skilled and the

novice group in Wilson et al.'s 2004 study may be explained by the difference in the gesture leg height, the question why the novice group failed to generate sufficient vertical leg height (and pelvic motion as well) still remains unanswered and further investigation is warranted. Regardless, the pelvis orientation facilitating the movement of the gesturing leg must be in proportion to the other tasks for which it is responsible.<sup>15, 16</sup>

The authors feel that the results of this study contribute to the discussion regarding the role of the pelvis in grand rond de jambe en l'air. Whereas the motion of the pelvis may or may not be encouraged in the dancer, pelvis orientation should be considered as it affects the entire body in movement and directly facilitates an increased vertical angle of the gesture leg. While this is indicated in pedagogic theory, it is perhaps misconstrued in the teaching of the movement. For example, Lawson<sup>9</sup> wrote about the necessity of the tipping of the pelvis to accommodate the increased height of the gesture leg above 45 degrees to the side and 30 degrees to the back, however Schorer<sup>11</sup>, writing on Balanchine Technique, noted that in grand rond de jambe en l'air it is important to "stand as straight as possible on the supporting hip and leg" and "the leg should only lift, ending the movement on the highest, most extended line". The difference between these two sets of instructions is notable, but in the end, it is clearly known by teachers of dance that while the pelvis does move, the emphasis in the movement is placed on the vertical angle of the leg and the whole picture that is created in the movement.

### **Summary and Conclusion**

The purpose of this study was to investigate the role of the pelvis and hip joint in

achieving the required gesture leg height in *grand rond de jambe* and to provide an answer to the existing controversy among the ballet practitioners, dance educators, and scientists regarding the role of pelvis. A group of skilled dancers (N = 8) performed grand rond de jambe at three different leg heights (90°, 105°, and full height). The gesture leg motion was dissected into the pelvic motion (anterior/posterior tilt, right/left lateral tilt, and left/right rotation) and the relative motion of the gesture leg to the pelvis at the hip joint (flexion/hyperextension, adduction/abduction, and internal/external rotation) for comparison among the leg height conditions.

It was concluded from the analysis that:

- In *grand rond jambe* of 90° or higher, dancers gradually increased pelvic motion, especially anterior/posterior and left lateral tilt, as the leg height demand increased. Approximately 4 to 16% of the leg height at EAM and 60% of the leg height at IDM were explained by the posterior and the anterior pelvic tilt, respectively. Maximum left lateral pelvic tilt was equivalent to approximately 45 to 60% of the maximum hip abduction.
- In *grand rond jambe* of 90° or higher, as the leg height demand increased dancers achieved the required leg height by increasing the pelvic motion predominantly. Gesture leg hip motion revealed minor contribution.

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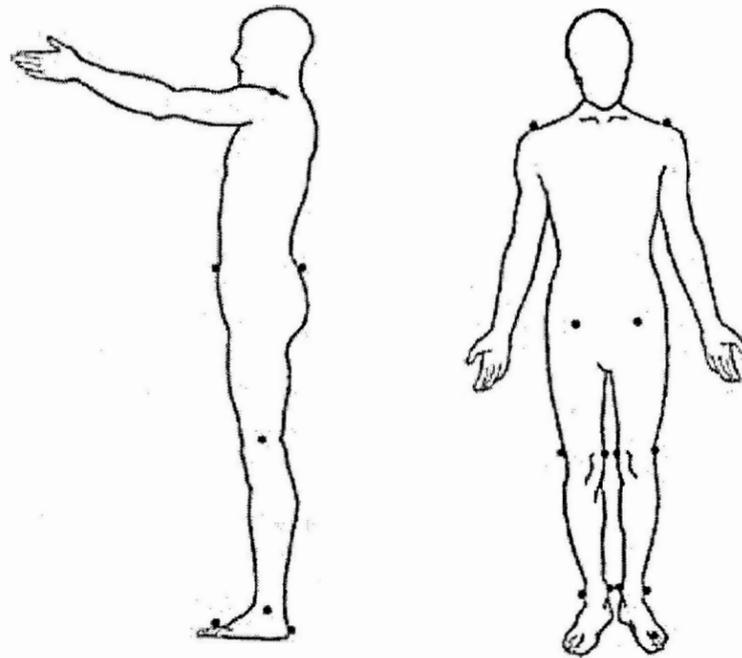


Figure 1: Marker placement. Bilateral markers included lateral and medial malleoli at the ankle, lateral and medial epicondyles at the knee, right and left ASIS (anterior superior iliac spine) in the pelvis and acromion processes in the trunk. Markers were also placed on the left heel and toe.

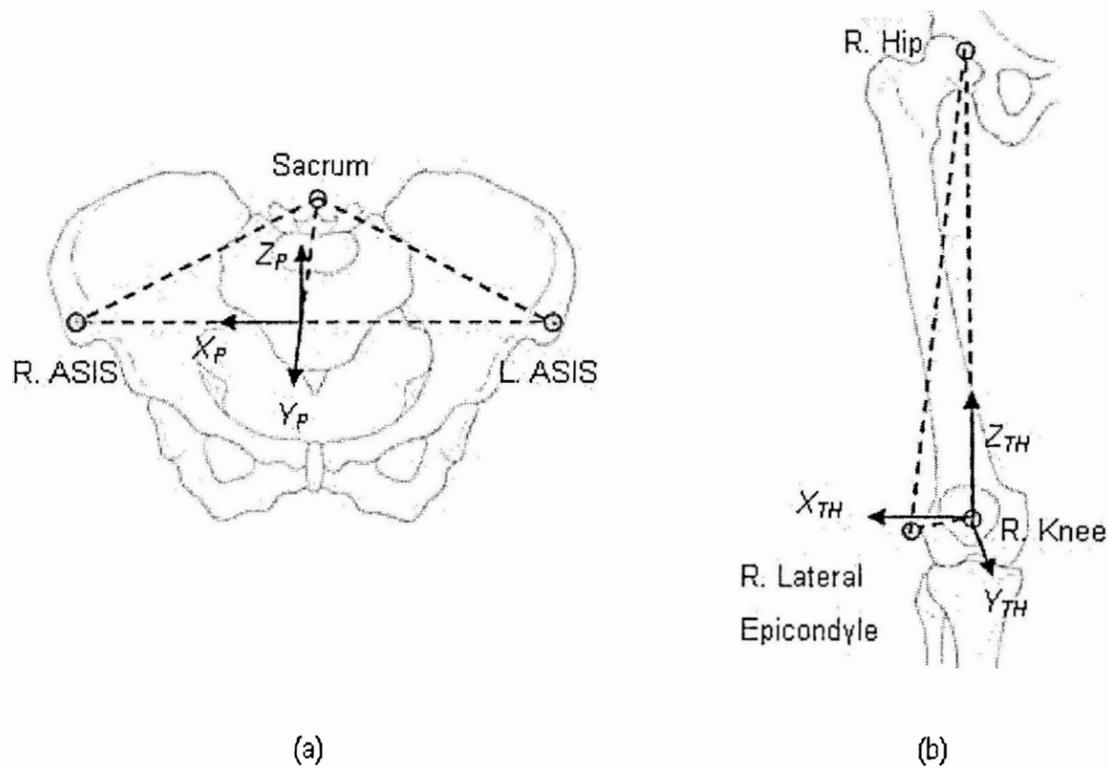


Figure 2: Pelvis (a) and right leg (b) reference frames. The pelvis reference frame was defined by the pelvic markers with the line vector drawn from the left ASIS to the right ASIS being the mediolateral ( $X_P$ ) axis. The longitudinal ( $Z_P$ ) axis was defined perpendicular to the plane formed by the three pelvic markers.<sup>1</sup> The right leg reference frame was defined by the hip joint center, knee joint center, and the medial and lateral epicondyle markers. The line vector drawn from the knee joint center to the hip was used

as the longitudinal ( $Z_{TH}$ ) axis of the leg while the anteroposterior ( $Y_{TH}$ ) axis was defined perpendicular to the plane formed by the hip joint center and the epicondyle markers.

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Figure 3. Visual guide used to show the target foot height. A camera tripod with a horizontal extension bar was placed in front and left side of the participant. The target height was computed based on the participant's leg length and the leg height demand ( $105^\circ$ ).

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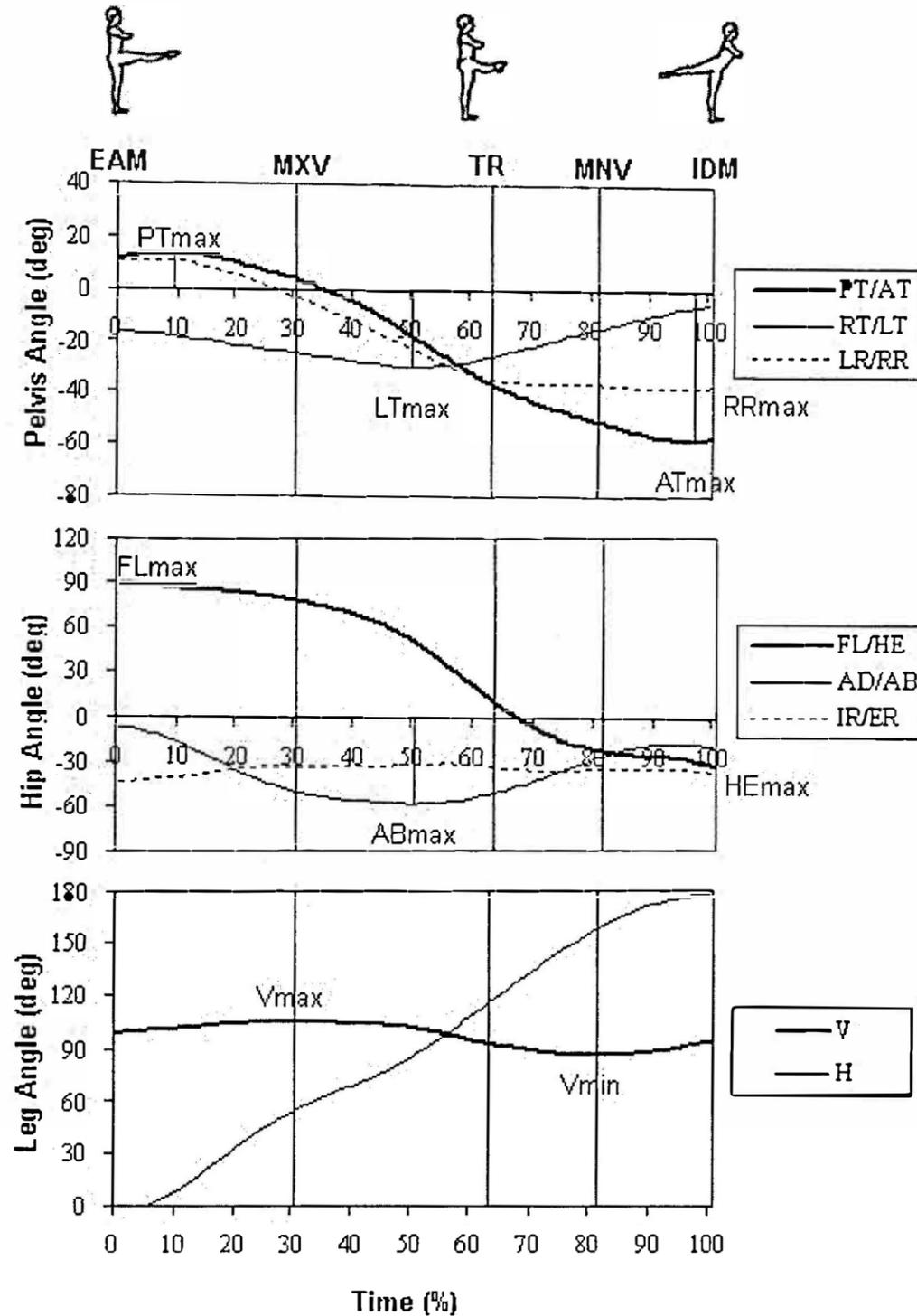


Figure 4: Exemplary pelvis, gesture leg hip and leg angle plots (105° condition). EAM to IDM was used as 100% time. Posterior/anterior pelvic tilt (PT/AT) pattern revealed two peaks (PTmax after EAM and ATmax before IDM). The pelvic rotation pattern and hip flexion/extension pattern showed gradual transitions from left (LR) to right rotation (RR) and flexion (FL) to hyperextension (HE), respectively. Only left lateral pelvic tilt (LT) and hip abduction (AB) were observed during this period and the maximum angles (LTmax and ABmax) were observed around 50% time when the leg's horizontal angle reached near 90°. The hip joint remained externally rotated (ER) throughout the entire period. Maximum and minimum vertical angles (Vmax and Vmin) were observed near 60° and 160° of horizontal angles, respectively.

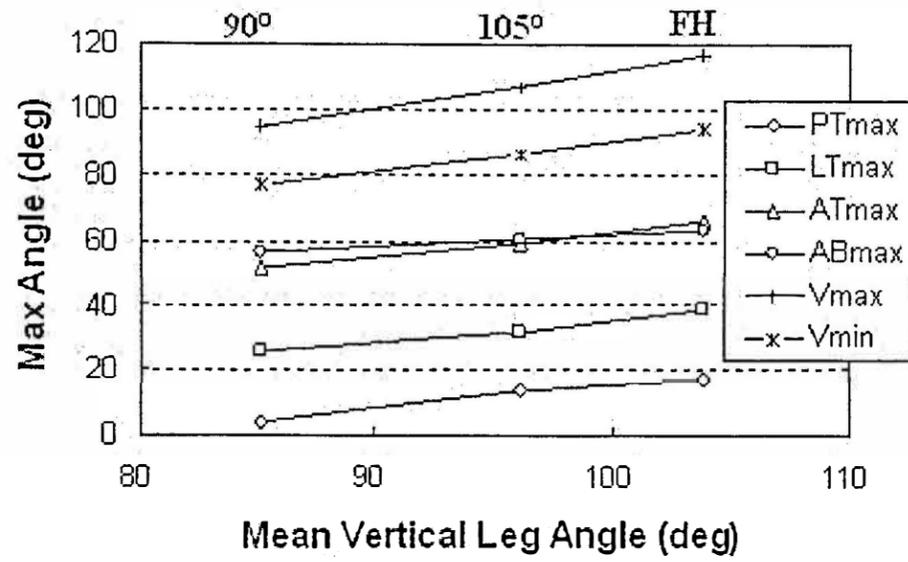


Figure 5. Relationship between the vertical leg angle and the peak pelvis and gesture leg motions. The vertical leg angle is the mean of the values at the five events shown in Table 2. Abbreviations: PT, posterior pelvic tilt; LT, left lateral pelvic tilt; AT, anterior pelvic tilt; AB, hip abduction; V, vertical leg angle.

## APPENDIX C

### Rond de Jambe Questionnaires

**Spring 2005 Rond de Jambe study**

1. In doing Grand rond de jambe en l'air, which leg do you prefer as a standing leg?

*Right*

*Left*

*No Difference*

**Can you explain why?**

2. In general, what is challenging for you in the execution of grand rond de jambe en l'air?

3. In general, what is easiest for you in rond de jambe en l'air?

4. Can you remember what you were thinking about during the execution of the rond de jambe during this testing session? Can you give me a list of the types of things you were thinking about?

5. In doing Rond de Jambe, which leg do you prefer as the moving or gesture leg?

*Right*

*Left*

*No Difference*

Is this simply a preference or do you notice physical differences in strength or flexibility of the gesture leg?

Is your preference related to an imbalance in your body or a past injury?

6. Was there anything that you discovered about doing rond de jambe during this testing session OR how you perform rond de jambe in general?

7. What cues or suggestions have been given to you by your teachers for executing grand rond de jambe en l'air? (How has this motion been explained to you?)

8. How do you know you have executed grand rond de jambe en l'air "correctly"?

9. What kinds of feedback do you rely on for evaluating grand rond de jambe en l'air?

10. Are you aware of the movement in the pelvis during Grand rond de jambe en l'air?  
Can you describe this for me?

11. Are you aware of muscular activity when executing Grand rond de jambe en l'air?  
Can you describe this for me?

12. Did your internal sense receive confirmation or contradictory evidence from outside information? (e.g. Margaret's comments or the testing environment?)

13. What do you think ability to execute a grand rond de jambe en l'air entails?