

## Pilates and Dance: A Reformer for the Art

By Gabriella Berkow  
Goucher College

### Introduction

As early as the 1920's, when founder Joseph Pilates opened his inaugural studio in the United States, Pilates conditioning has been extremely popular among dancers (Gallagher, 1999, p.9). Leading dance figures such as George Balanchine and Martha Graham studied with Joseph Pilates and sent their students to train with him, causing Pilates to gain a significant following in the dance community (Gallagher, 1999, p.9). Continuing to grow in popularity among dancers, many dance companies, studios, and undergraduate and graduate programs now incorporate Pilates conditioning into their training (Ahearn, 2006, p.92). The anatomical and conceptual similarities between Pilates and dance, as well as the many benefits of Pilates for dancers, explain the lasting and growing popularity of Pilates conditioning among dance communities throughout the world.

### The Six Principles of Pilates

A basic reason for the popularity of Pilates in the dance world lies in the connections between the Six Principles of Pilates and the fundamental elements of dance.

- 1) *Centering*: Both Pilates and dance emphasize a strong center and correct alignment. Pilates “centers” on strengthening the Powerhouse, or the area of the trunk between the rib cage and pelvis, to facilitate correct positioning of the spine as well as support and alignment through the rest of the body (Gallagher, 1999, p.27). This promotes the muscle engagement needed for core stability and proper posture in dance (Ahearn, 2006, p.93).
- 2) *Concentration*: Dance requires utmost focus and concentration to be performed correctly: the mind must direct and coordinate the simultaneous motion and positioning of several body parts to achieve a desired movement. Therefore, the central nervous system must be trained and the proper neural pathways must be formed to engage muscles appropriately (Grieg, 1994, p.5-6). Pilates emphasizes using the mind to direct muscle movements and control the positions of joints throughout the body with a concentrated somatic focus (Siler, 2000, p.15). This supports dancers’ attention to correct movement and kinesthetic sensations as well as their ability to cognitively coordinate and organize motions and positions (Ahearn, 2006, p. 93).
- 3) *Control*: All dance movements require control for correct alignment and execution, stabilization of stationary body parts, and prevention of injury (Ahearn, 2006; Paskevaska, 1992). Pilates focuses on performing all movements with mental and physical control, supporting the cognitive and muscular control needed in dance.
- 4) *Precision*: Precision lies at the heart of dance technique. Technical training focuses on performing movements with correct placement and desired aesthetic qualities. The same fundamental movements and concepts, most notably the ballet barre exercises, are repeated in dance classes universally to enforce precision. Pilates also emphasizes precision, attending to the form, details, and value of each exercise and prioritizing correctness over quantity (Ahearn, 2006, p.93).
- 5) *Flow of Movement*: Dance movements are performed with fluidity and flow together with smooth transitions, preparations, and conclusions (Ahearn, 2006, p. 96). The continuous flow and grace of motion in Pilates, including the fluid transitions between exercises, matches this need for organic connectivity throughout dance movements (Siler, 2000, p.16).
- 6) *Breath*: Proper breathing is crucial to support the advanced motor demands of dance. Coordinating continuous breathing with movement ensures that working muscles receive a steady supply of oxygen and reduces unnecessary tension (Ahearn, 2006, p.96-97; Grieg, 1994, p.68). Pilates’ focus on continuous, full respiration and a specific breathing pattern for each exercise corresponds to the needs for constant breath cycles and synchronization of breathing with movement in dance.

### Anatomical and Kinesthetic Connections Between Pilates and Dance

Enhancing these conceptual similarities, anatomical and kinesthetic relationships between Pilates and dance movements have contributed to the popularity of Pilates training among dancers. These relationships include:

- *Alignment and Core Stability.* The Pilates Powerhouse, commonly called the body's "Core," includes the abdominal, lower back, and gluteal muscles that align the spine and pelvis in their correct positions (Smith, 2009). Correct positioning of the spine and pelvis involves maintaining the natural curves and length of the spine while holding the pelvis vertical without any tilt, aligning the anterior superior iliac spines over the pubic symphysis (Clippinger, 2007, p.93). This "neutral" spine and pelvis position requires pulling in the abdominals, engaging the back extensors, and sustaining a balance of strength and flexibility between the hip flexors and extensors (Clippinger, 2007, p.85,185,187; Smith, 2009). The Powerhouse particularly emphasizes the deep stabilizer muscles closest to the spine, such as the transverse abdominis, erector spinae, lumbar multifidi, and quadratus lumborum (Smith, 2009). It also engages the muscles that lift the front rim of the pelvis correctly in relation to the lower back, such as the iliopsoas and gluteals (Smith, 2009). This provides internal support throughout the torso that promotes correct alignment and efficient motion through the entire body (Isacowitz, 2006, p.20). With the core musculature keeping the spine and pelvis in the "best postural position" to support movement, muscles of the limbs can move freely and efficiently because they do not need to over-work to compensate for postural displacements (Isacowitz, 2006, p.20; Smith, 2009). Dance requires proper placement of the spine and pelvis to align the body, support and stabilize the torso, and allow for full range of motion in the hip joint (Ahearn, 2006, p.93; Fitt, 1996, p.163). Core stability, or maintaining neutral spinal-pelvic alignment, also provides central control for movement, efficient weight transfer, and shock absorption to prevent injury (Clippinger, 2007, p.112-113; Smith, 2009). Therefore, Pilates' focus on the Powerhouse and correct positioning of the spine and pelvis can enhance dancers' mental understanding of and physical ability to achieve proper alignment (Ahearn, 2006, p.94, 98). By engaging the abdominals, lower back, and gluteals through all exercises, Pilates can give dancers the core strength to move with stability, control, and full range of motion.
- *Posture and the Shoulder Girdle.* Pilates emphasizes proper posture and openness through the shoulders and chest. Throughout all exercises, the shoulders are kept down and back and the chest remains open. Therefore, the shoulder girdle musculature forms a "secondary powerhouse:" the muscles that stabilize the shoulder complex and depress and adduct the scapula, externally rotate and extend the shoulder, and open the chest engage through all movements (Massey, 2009, p.12). These muscles of the "secondary powerhouse" include the lower trapezius, serratus anterior, rhomboids, latissimus dorsi, infraspinatus, teres major and minor, and pectoralis major and minor (Clippinger, 2007, p.404; Massey, 2009, p.12). Pilates' emphasis on proper posture matches the demands in dance for keeping the shoulders down and back, stabilizing the scapulae, and opening the chest (Clippinger, 2007, p.410; Grieg, 1994, p.76-78; Paskevaska, 1992, p.25). Therefore, strengthening and consistently engaging the muscles of the "secondary powerhouse" in Pilates can help dancers sustain proper positioning of the shoulder girdle and correct postural problems associated with rounded shoulders.
- *Pilates Stance and Turnout.* Like classical dance movements, most Pilates exercises are performed turned out, or with external rotation of the legs from the hip joint. However, unlike the extreme turnout demanded in classical ballet, the "Pilates Stance" position places the heels together but toes only slightly apart (Gallagher, 1999, p.27). The focus of Pilates Stance is engaging the deep outward rotators, gluteals, and adductors to maintain external rotation from the hip rather than on achieving a 180° turnout. The emphasis is on "squeezing the backs of the upper inner thighs" and "wrapping" the upper legs outward, which helps to disengage the quadriceps, "engages instead the target areas of the hips, buttocks, and outer and inner thighs," and stabilizes the lower body (Siler, 2000, p.22). Consistent use of Pilates Stance can help dancers to use their natural external rotation from the hip rather than compromising correct alignment to meet the extreme flexibility demands of the 180° turnout aesthetic. It can also help them to find and strengthen the muscles they need to maintain turnout with the spine and pelvis properly placed, enhancing the activation of the deep outward rotators, gluteals, and adductors and reducing over-recruitment of the quadriceps.
- *Symmetry.* Pilates emphasizes symmetry throughout the body. Throughout all exercises, the shoulders and hips remain square and level so that the torso keeps a "box" shape (Gallagher 14). Additionally, both arms and legs perform movements of the same size, and the torso muscles on both sides of the spine engage evenly. This focus on symmetry makes Pilates excellent for correcting muscular imbalances in strength and flexibility, as the goal of symmetry in each exercise inherently enhances activation from the weaker or tighter side, and also promotes uniform support around the spine. For dancers, the theme of symmetry in Pilates can help to reduce discrepancies in muscle strength and flexibility, promote bilateral muscle recruitment, and maintain squareness in the shoulders and hips. This supports balanced muscle tone and lessens the susceptibility to injury on one side of the body.

- *Lengthening and Avoiding Hyperextension.* Pilates exercises emphasize lengthening, particularly of the spine, and can help dancers to find and support full muscle length without locked or rigid joints. An overarching image in all Pilates work is to “keep lengthening your muscles as you straighten them” (Siler 21). This enhances muscular support for the entire range of extension, supports the development of flexibility, and reduces undue tension. Lengthening promotes a balance of strength and stretch throughout the body as well as a tall, lifted posture, which correspond directly to the demands of dance. Pilates’ emphasis on lengthening also encompasses avoiding hyperextension: the elbows and knees should never “lock” or extend past a straight 180° angle (Gallagher, 1999, p.13). Avoiding hyperextension is important for preventing injury because the elbows and knees are not aligned with the rest of the body when hyperextended (Gallagher, 1999, p.14). This emphasis can teach hyperextended dancers to find the patterns of muscular activation needed for correct extension and can reduce their risk of injury (Ahearn, 2006, p.98).
- *Integrated and Full-Body Muscle Engagement.* Movements in both dance and Pilates integrate actions of muscles throughout the entire body, involving contracting, lengthening, and full range of motion in all planes (Ahearn, 2006, p.98; Loosli, 1992, p.11). Additionally, many exercises in Pilates simulate dance movements but are performed in lying or sitting positions; this decreases the resistance from gravity and muscles’ anti-gravity efforts that occur when standing (Self, 1996, p.336). As a result, Pilates exercises allow dancers to focus on alignment and muscular sensations while increasing strength and flexibility (Loosli, 1992, p.10; Self, 1996, p.336).
- *Injury Rehabilitation.* With these kinesthetic similarities, Pilates is also very popular among dancers for injury rehabilitation. Pilates’ emphases on proper alignment, “total integration of the body,” and building strength through a full range of motion, as well as its ability to simulate dance movements with control of resistance, make it “ideally suited to use with dancers in the rehabilitation of an isolated joint” (Loosli, 1992, p.1, 10-11).

#### Pilates Exercises to Enhance Dance Technique

Pilates’ themes of centering, strength, flexibility, control, and kinesthetic awareness can be applied to dance technique for significant improvements in skill and injury prevention. The outcomes of Pilates training for dancers are “a valuable core or center, improved alignment, increased muscle flexibility and strength, and more balanced development of the musculature” (Ahearn, 2006, p.92). Providing scientific support for these benefits of Pilates for dancers, studies by kinesiologists Scott Brown (1996), Karen Clippinger (1996), Sally Fitt (1993-1994), Robin Kish (1998), Alvin Loosli (1992), Susan McLain (1997), Ann McMillan (1998), Amanda Parrot (1993), and Brian P. Self (1996) have shown that Pilates can enhance dancers’ strength, flexibility, alignment, and performance.

Many Pilates exercises from the mat, Reformer, and other apparatuses correspond particularly well to specific dance movements and technique concepts. To support accessible Pilates conditioning for both dancers and instructors, without the requirements of equipment, the table titled “Pilates Mat Exercises for Dancers” represents a routine of selected Pilates mat exercises that relate precisely to dance technique. The selected exercises and their relations to dance were developed through research in Pilates books and articles and in consultation with Romana’s Pilates Certified Instructor Elizabeth Lowe Ahearn, who founded the Goucher College Pilates Center and serves as Chair of Goucher’s Dance Department. Dance students and their teachers can utilize this Pilates mat sequence to enhance alignment and posture, promote dance-specific gains in strength and flexibility, and improve targeted components of dance movements or positions.

To experientially determine its effectiveness in improving dance technique, the “Pilates Mat Exercises for Dancers” routine was taught to dance students with Pilates experience at Goucher College during spring 2010. The benefits of the

exercises were assessed via students' responses to questions about how the training affected their dancing. All of the students found that the Pilates classes helped their technique by enhancing awareness of and strength to maintain correct alignment, improving posture, and increasing control and range of motion. The students also noted that both verbal and hands-on corrections were helpful and clearly related the Pilates movements to dance. These results illustrated that the Pilates mat exercises can augment dancers' neuromuscular connections to their alignment and posture, increase flexibility and control, and improve important components of specific dance movements. They also showed that clear statements relating Pilates exercises to dance movements or concepts, as well as specific verbal and tactile feedback, are essential for understanding and improvement.

#### Incorporating Pilates into Dance Education

Given the evidence for Pilates' ability to enhance so many aspects of dance technique, dance teachers can incorporate Pilates concepts and exercises into their pedagogy to provide an excellent form of supplemental conditioning for their students. Pilates exercises are most beneficial if they are gradually incorporated prior to a ballet barre, as this helps students to find their centers, focus their minds, enhance their warm-up, and clearly relate Pilates exercises to the fundamental ballet barre movements (Ahearn, 2006, p.94). Ideally, the same teacher should instruct both the Pilates mat exercises and the dance technique class that follows (Ahearn, 2006, p.94). If this is not possible, the dance and Pilates instructors should consult to discuss common objectives, teaching methodology, and ways to cross-reference the Pilates and dance exercises.

Before applying Pilates work in the dance technique classroom, students should gain at least a basic knowledge of anatomy and kinesiology so that they understand the musculoskeletal system, physical demands of dance, elements of safe and efficient movement, and structural differences in body types (Ahearn, 2006, p.94). The dance teacher should also note students' injuries, skeletal misalignments, and muscular imbalances (Ahearn, 2006, p.94). Pilates training should begin with an introduction to its theoretical components, conveyed through readings and discussions of its history, Six Principles, and key terms as well as its applications and benefits for dance (Ahearn, 2006, p.94). Next, students should "begin to kinesthetically learn and perform mat sequences" (Ahearn, 2006, p.94). Depending on the teacher's objective, students can learn selected mat exercises that augment specific technique points of a dance class or they can learn regular mat sequences with a broader scope. The "Pilates Mat Exercises for Dancers" can be used to address specific issues or problems in dance technique and to highlight direct anatomical applications of Pilates exercises in dance. During this initial Pilates instruction, the teacher should focus on the proper form, breathing, and purpose of each exercise (Ahearn, 2006, p.94). As students become familiar with and master the Pilates routine, the teacher can add exercises and progress the students to a higher level (Ahearn, 2006, p.94). At this point, the teacher can also discuss the primary muscle groups and joint movements in each exercise (Ahearn, 2006, p.94). Throughout all of the Pilates mat exercises, the dance teacher can address musculoskeletal deviations previously noted and also spot other misalignments, as anatomical discrepancies are easier to recognize when students lie supine than when they stand (Ahearn, 2006,

p.98). The teacher can then discuss and work to correct these problems in both the Pilates mat sequence and dance technique class (Ahearn, 2006, p.98).

Once students have demonstrated a clear understanding of and proficiency in Pilates, the teacher can discuss Pilates' relationship to dance technique during the mat instruction (Ahearn, 2006, p.95). The instructor should focus on the Pilates method's ability to improve the alignment, strength, control, balance, and flexibility needed for correct dance technique (Ahearn, 2006, p.95). He/she should highlight how the Six Principles of Pilates relate to dance (Ahearn, 2006, p.96). The teacher should also emphasize and discuss the similarities between specific Pilates mat exercises, proper placement, and classical dance vocabulary, and can use the Dance Movement/Concept column of the "Pilates Mat Exercises for Dancers" chart as a guide (Ahearn, 2006, p.95). Making clear connections between Pilates exercises and dance movements or concepts is crucial for students' ability to transfer muscular sensations from lying or sitting Pilates exercises to standing work and complex motor patterns.

After the Pilates mat sequence is completed, concepts discussed in the Pilates workout need to be reinforced and similarities between Pilates and dance need to be highlighted throughout the dance technique class. Improvements in alignment and body positioning from Pilates can be applied to standing dance movements more easily if the students are familiar with the dance exercises that follow the matwork (Ahearn, 2006, p. 94). The dance teacher should begin the barre sequence with a *plié* combination that the students have already mastered so that "the new sensations and knowledge gained from the Pilates exercises [can] be assimilated into preliminary barre work with as few distractions as possible" (Ahearn, 2006, p.94). As the dance class progresses, utilizing exercises that students know enhances their ability to apply their Pilates work to dance by allowing them to focus primarily on their new neuromuscular sensations rather than on learning steps. The teacher should point out connections between Pilates and dance movements throughout the dance class, discussing "the relationship between specific mat exercises, proper placement, and classical vocabulary performed at barre and in center" (Ahearn, 2006, 95). The teacher should also note central elements such as the use of the Powerhouse to keep the abdominals engaged and pelvis aligned, the maintenance of proper shoulder positioning and lengthened posture, and the relationship of Pilates Stance to sustaining turnout. Based on the results of the research studies by Self (1996) and Fitt (1993-1994), the teacher should allow at least six weeks for muscle strength to increase and for improvements from Pilates to transfer to dance movements (Self, p.153). The differences in the body's relationship to gravity during sitting or lying Pilates exercises and standing work, as well as the need to integrate Pilates-based improvements in strength and alignment into the complex neuromuscular patterns of dance movements, can lengthen the time required for the benefits from Pilates to manifest in dance technique (Fitt, 1993-1994, p.48; Self, 1996, p.153).

As dance students become more proficient in Pilates and use it to improve their dance technique, they "gain the ability to self-correct errors in placement and performance and, most importantly, to avert them" (Ahearn, 2006, p.94-95). By enhancing

intellectual and kinesthetic understanding of correct alignment, Pilates supports dancers' capability to self-correct posture (McMillan, 1998, p.107). Pilates' emphases on concentration, control, and stabilization of the spine and pelvis in a neutral position help students to detect and correct displacements and errors, develop a cognitive reference for proper alignment, and apply their understanding to physical movements (McMillan, 1998, p.107). With this integration of Pilates training and dance technique classes, dance students can "create kinesthetic, visual, and intellectual references that allow them to perform Pilates and dance sequences more effectively" (Ahearn, 2006, p.95).

#### Conclusion: Application of Pilates to Dance Technique

The Pilates method provides an ideal mode of supplemental conditioning for dancers. The conceptual and anatomical connections between Pilates and dance can greatly facilitate proper execution of movement, prevention of injury, and longevity of dance careers. Pilates' Six Principles and focuses on core strength, correct body placement, turnout, lengthening, and full-body muscle use correspond seamlessly with dance technique. Pilates exercises utilize many of the same muscles and emphasize the same important elements as fundamental movements and concepts in dance. Therefore, Pilates training can improve dancers' core stability, static and dynamic alignment, posture, strength, flexibility, balance, and cognitive control of neuromuscular actions. This wealth of benefits of Pilates makes it a highly valuable tool for dance teachers to incorporate into their dance technique classes. The "Pilates Mat Exercises for Dancers" developed in this research provides a method for tailoring Pilates instruction to the demands of dance and addressing the issues or problems of individual dancers. Facilitating students' intellectual and kinesthetic connections between dance and Pilates also enhances achievement of objectives that extend across and beyond the two disciplines, such as increased body awareness, enhanced musculoskeletal integration, and better overall health. Thus, Pilates gives dancers, dance teachers, and all those involved in the world of dance science a powerful tool that can serve as a "Reformer" for their art.

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