

SARA M. SALVITTI
Rutgers University

Considering Klein Technique™: A core stability alternative for contemporary dance education

ABSTRACT

This article investigates core stability and its influence on contemporary dance technique. After studies found delayed transverse abdominis timing in chronic lower back pain sufferers, physiotherapists created exercises to override what they perceived to be a motor control deficit. They hypothesized that back pain could be alleviated by strengthening the abdominal muscles through isolated contraction. This later became known as the 'core stability' approach and was implemented by many dance teachers to improve alignment and prevent injury, yet despite critique from the scientific community, the theory has gone relatively unchallenged. This article will examine its physiological impact on dance technique while considering one alternative approach; Klein Technique™, a movement education system designed to serve as a theoretical and practical underpinning for contemporary dance technique to improve function. Analysis is supported by the author's decade long study of Klein Technique, teaching the method and an interview with creator Susan Klein.

KEYWORDS

contemporary dance
technique
core
core stability exercise
dance pedagogy
Klein Technique™
Pilates

1. *Chronic* refers to pain that accumulates over time, therefore CLBP does not refer to back pain caused by acute trauma.

INTRODUCTION

This article will focus on investigating core stability theory and exercise and its influence on contemporary dance technique. Core stability or 'CS' theory rests on the belief that chronic lower back pain is the result of an unstable spine caused by weak or under-functioning abdominal and lower back muscles. CS theory led to the development of core stability exercise or 'CSE', which was created to strengthen these perceived deficient muscles collectively referred to as the 'core', to increase spinal stability and alleviate chronic lower back pain or 'CLBP'. CSE was brought to the masses through physiotherapy and athletic training as many believed it could alleviate common back pain and enhance athletic performance (Bee 2010; GravityFit 2016; Jull and Richardson 1995: 5; Richardson et al. 2002: 399, 405).¹ This article will consider some of the scientific research that constructed CSE; Richardson et al. (1990); Jull and Richardson (1995); Hodges and Richardson 1996, 1998 and 1999; Hodges et al. (1997); Richardson et al. (2002); and some of the research that scrutinized it; Lederman (2007) and McLean (2006) to determine if there is enough conclusive evidence to support the prevalent belief amongst many contemporary dance community members that CSE improves technique, virtuosity and performance (Clippinger 2007: 94; Haas 2010: 63, 70).

CSE came to mainstream attention in the mid-1990s after studies led by a team of Australian researchers determined CLBP sufferers had delayed transverse abdominis timing issues (Hodges and Richardson 1996: 2647). Many in the Pilates community embraced the research and as a result, CSE began to surface in dance pedagogy (Bee 2010; Dionne 2015; Hargrove 2012; Lederman 2007: 1; Siler 2000: 3; Reynolds 2009). Presently, many in the dance field largely assume that *engaging* or contracting the core improves alignment and prevents injury, despite the warning from many researchers that no 'unique group of "core" muscles [work] independently of other trunk muscles to stabilize the spine' (Bee 2010; Farrell 2015; Lederman 2007: 1, 6,



Figure 1: 'Susan Klein teaching the roll down'. Photograph courtesy of Brittany Carmichael.

12; McLean 2006: II, 2; Reed et al. 2012: 705–06; Reynolds 2009; Rickman et al. 2012: 147; Stanton et al. 2004: 528). Opponents, including some biomechanists, osteopaths, physiotherapists and somatic teachers, are surprised that little published criticism exists, often referring to CS as a ‘myth’, because they do not believe the approach is appropriate for healthy individuals or high functioning athletes (Lederman 2007: 1; McLean 2006: 2). For these reasons, along with an unfavourable CSE experience during my contemporary dance conservatoire training, I think it is problematic that CS theory is so deeply embedded in contemporary dance pedagogy (Cappelle 2014; Restani 2016; Rivers 2016; Rutgers, Mason Gross School of the Arts Dance 2016; Steps on Broadway 2016; Wroth 2016). Therefore, I seek to challenge the approach and offer one alternative method for consideration; Klein Technique™, a movement education system created for dancers by Susan Klein—former dancer, movement therapist, certified Zero Balancer and Worsley Five-Element acupuncturist, L.Ac., M.Ac., B.Ac. (United Kingdom), Dipl. Ac. (NCCAOM), to improve virtuosic performance and minimize the risk of injury through a clinical practice theoretically constructed using basic principles of physics and anatomy that borrows and builds upon theories and exercises from Bartenieff Fundamentals, Laban Movement Analysis, Worsley Five-Element Acupuncture and Zero Balancing®.^{2,3}

2. Susan Klein practices Worsley Five-Element Acupuncture based on ancient Chinese acupuncture as interpreted by English professor J. R. Worsley (Worsley Institute 2015).
3. Zero Balancing is a body-mind therapy developed by Dr Fritz Smith that uses touch to change the relationship between energy and body structure to relieve physical and emotional pain (Zero Balancing® 2016).

WHAT IS CORE STABILITY?

In the mid-1990s, Australian physiotherapy professors Dr Paul Hodges and Dr Carolyn Richardson conducted studies with a team of researchers to discover more information about the fundamental causes of CLBP (Reynolds 2009). During a 1996 study using two control groups – fifteen CLBP sufferers and fifteen people with healthy backs – Hodges and Richardson used surface and fine wire electrodes to monitor trunk muscle activity while both



Figure 2: ‘Susan Klein teaching carving up to standing’. Photograph courtesy of Brittany Carmichael.

groups performed rapid shoulder flexion, abduction and extension. Their results found that the transverse abdominis or 'TrA' was the first trunk muscle to contract in the healthy back group, while there were significant delays in those suffering from CLBP. The researchers concluded that the brain alerted the TrA to brace the spine in preparation for movement and hypothesized that the delayed onset contraction indicated a motor control deficit. Hodges and Richardson believed their research demonstrated that the TrA had a critical role in stabilizing the spine that had not been previously recognized (Hodges and Richardson 1996: 2640, 2647). In later clinical studies, Richardson concluded that deliberately contracting the TrA through repetitive exercise could offset the delayed timing by overriding the deficit. She believed the research demonstrated a decrease in pain symptoms by alleviating the TrA delay, which she says 'introduced the concept of core stability' to physiotherapy (GravityFit 2006; Jull and Richardson 2000; Lederman 2007: 4). This introduction and subsequent codification of CSE may have contributed to the mainstream belief that CLBP is a result of compromised spinal stability caused by weak abdominal muscles (Johnson 2012: 10–11; Lederman 2007: 1).

If there was 'a Holy Grail of fitness to have emerged over the past decade, it has to be the pursuit of core stability' commented fitness journalist Peta Bee (Bee 2010). Hodges' and Richardson's attempt to strengthen the TrA through isolation 'leaked into gyms and Pilates classes' and may have spawned the genesis of CSE, *core exercises* or the 'spectrum of exercise approaches that have the common goal to improve lumbopelvic control' (Abdul et al. 2014; *Dictionary of Sport and Exercise Science and Medicine by Church Livingstone* 2008; Hodges 2003: 245). As previously mentioned, CS theory is widely accepted yet no universal definition of the 'core' exists (Johnson 2012: 14; McLean 2006: 2). Based on some interpretations, the core can include a combination of the following; the TrA, rectus abdominis, multifidus, spinal erectors, trapezius, latissimus dorsi, adductors, glutes, quadratus lumborum, diaphragm, pelvic floor, internal and external obliques and psoas (Johnson 2012: 5–8; Kibler et al. 2006: 189–90; McGill 2010: 33).

Of particular importance within the context of this article is the inclusion of CS theory in Pilates, a contemporary version of the fitness method once called Contrology created in the early 1900s by German trainer Joseph Pilates. Pilates' work had a massive impact on dance pedagogy in part because major dance figures such as George Balanchine and Martha Graham were students of the method (Bee 2010; Reynolds 2009; Siler 2000: 2). Pilates himself referred to the midsection of the body as the *powerhouse* and taught his students to 'draw-in' the abdomen to innervate the midsection and initiate all movements from what he considered the *girdle of strength* (Gallagher and Kryzanowska 1999: 27; Siler 2000: 194). Based on the history and prevalent use of *core* in marketing and instruction, I offer the hypothesis that some in the Pilates community either created or co-opted the term and use it interchangeably with *powerhouse* in an effort to remain relevant in the fitness industry (Mountain Laurel Pilates 2015; Geweniger and Bohlander 2012: 15; Reynolds 2009; Siler 2000: 16; Siler 2013; Stanley 2000). I also would like to flag that Joseph Pilates began codifying his method while serving as a hospital orderly during World War I. It was there that he experimented modifying hospital beds to help support and aid bedridden soldiers' ailing limbs. These 'spring-based exercises' inspired the blueprints for the Cadillac and Reformer, two apparatuses Pilates would later design to

enhance the fitness programme (Siler 2000: 2). Therefore, I ask the reader to consider whether exercises and machines created to help bedridden students are appropriate for healthy dancers and those suffering from injuries or pain that does not entirely prevent locomotion. In an effort to thoughtfully expose the potentially misleading implications of CSE, I will attempt to deconstruct the theory that underpins the approach.

CSE: THEORETICAL AND PRACTICAL CONSIDERATIONS

While a conservatoire student of contemporary dance and ballet at Rutgers University in New Jersey (2003–07) and later as a professional dancer studying contemporary⁴ and ballet technique in New York at some of Manhattan's most respected dance studios including Gibney Dance Center, Peridance and Steps On Broadway (2007–15), the vast majority of teachers I studied with included CSE, used CS theory as an underpinning to their pedagogic approach and consistently asked my classmates and I to 'engage' our core regardless of absent trunk motor control issues. All of these teachers believed engaging the core would increase spinal stability by protecting the lower back and as a result, improve alignment and therefore technique (Cappelle 2014; Restani 2016; Rivers 2016; Rutgers, Mason Gross School of the Arts Dance 2016; Steps on Broadway 2016; Wroth 2016). It was also common for many teachers from both academic and professional contexts to use Pilates cues such as 'connect your navel to your spine' to verbalize how to engage the core (Siler 2000: 194).⁵ While not every contemporary or ballet teacher subscribes to CS theory or teaches CSE during technique classes, its mass permeation of dance education cannot be downplayed.

While the Hodges and Richardson studies were widely embraced, there are several researchers who have challenged this dominant ideology. Assistant professor of physical education at Indiana State University Thomas Nesser believes that 'despite the emphasis fitness professionals have placed on functional movement and core training for increased performance, they should not be the primary emphasis of an exercise programme' (Bee 2010). Stuart McGill, professor of spine biomechanics at the University of Waterloo in Canada found that 'the amount of load the spine could bear was actually greatly reduced when subjects sucked in their belly buttons', becoming 'weak and wobbly' when they tried to move (Bee 2010). He concluded that 'concentrat[ing] on strengthening only one set of muscles can destabilize the spine by pulling it out of alignment' (Reynolds 2009). Alexander Technique teacher Adrian Farrell simply states that there is no medical reason one needs a 'strong core' to improve one's health. 'Millions of years of evolution have given [us] postural reflexes that work just fine if [we] don't interfere with them' (2015).

Perhaps CS's toughest critic is osteopath and professor Dr Eyal Lederman who wrote the seminal article, 'The myth of core stability' (Lederman 2007). Lederman's clinical research concluded that 'a person would have to lose substantial trunk muscle mass' before the spine is destabilized, debunking the dominant belief that strengthening the core increases stability (Lederman 2007: 5). His research also revealed that weak abdominal muscles were not the cause of back pain, nor can the TrA be engaged in isolation (Lederman 2007: 12; Thomas 2015). Lederman believes that CSE is no more effective or preventative than any other form of exercise (Johnson 2012: 21; Lederman 2007: 12). He maintains that core contraction is typically very minimal during ordinary

4. Contemporary dance in this context refers to the American definition in practice, particularly referencing how it is taught and defined in most university dance programmes. Unlike the UK system that I observed while a student at Roehampton University, American contemporary or *modern* dance classes are an amalgamation of several different techniques depending on the professor's experience. While Roehampton tended to take a more classical approach and teach pure Graham or Cunningham classes, American contemporary dance classes can include elements from several techniques.
5. Pilates teacher and author Brooke Siler defines 'connecting the navel to the spine' as the 'physical and mental act of connecting [the] abdominals to [the] spine' through contraction (2000: 194).

movements such as ‘bending, lifting and carrying’, leaving one vulnerable to ‘damaging the spine’ if continuously contracting ‘the trunk muscles during daily and sports activities’ (Thomas 2015). Again, I ask the reader to question whether this practice is helping or hurting dancers. Using pregnancy and birth as a practical example to further illustrate his perspective, Lederman argues:

It’s very obvious that we really, really don’t understand the biomechanics of backs at all, because when you start thinking about it, after delivery, how does the whole thing hold together, the area of the lower back, [the] abdomen? Why doesn’t it just collapse on itself? It doesn’t. It’s actually quite robust and women can go through great physical challenges during [pregnancy] and without seemingly any kind of great injury. That knocks out the whole idea that strong core muscles are important to prevent back pain or cure back pain, and so on.

(Thomas 2015)

While Lederman does not entirely discredit Hodges’ research, he does not believe it provided any new, revolutionary ideas, especially not the kind that would be adopted by physical therapists, fitness trainers, coaches, Pilates instructors, yoga and dance teachers, among others (Thomas 2015). These findings contradict both Hodges’ theory and the dominant ideology about ‘engaging the core’ in contemporary dance technique. Another theoretical concern Lederman has with CS theory is that it divides and isolates muscles of the trunk into a sub-group, creating a practically useless muscular hierarchy (Thomas 2015). Lederman reminds researchers that it is humans that categorize muscles stating,

There are no sub-systems in the body. We’d like to believe there are muscle chains and some kind of system of core, global muscles and so on, but it just doesn’t exist. [Muscles] are organizing according to the task that the person is performing.

(Thomas 2015)

It is imperative for dance teachers to understand that muscles do not determine the force used during a task; the task, in this case dance movement is the determinant while the muscles perform the movement (Thomas 2015). In other words, keeping the core engaged or contracted is not relevant for all movements. To concentrate on continuously contracting one’s ‘abdominal musculature is counterintuitive to motor learning principles’ while ‘focusing on tasks external to the body is more conducive to performance improvement’ summarizes physical therapist Jeff Cubos (2010). ‘You don’t hit a tennis ball by focusing on your muscles...’ one should do this using ‘spatial awareness’ explains Farrell (2015). Consequently, dance academia and private studios may wish to re-evaluate why they include CSE in their technical curriculum. There are several somatic methodologies such as the Alexander Technique and The Feldenkrais Method that have been used as alternative modes of training for contemporary dancers. This article will introduce a lesser-known approach called Klein Technique™, a movement education system created to teach dancers how to negotiate the forces of gravity through the skeletal system to leverage off from the floor to move to improve function and enhance technique to serve the pursuit of any choreographic style or level of virtuosity.

SUSAN KLEIN: EARLY INFLUENCES

Susan Klein's dance studies began as a young child growing up in a New York suburb in the early 1950s where she studied German modern dance and the Graham Technique (Klein 2005). At age 19, on the brink of joining a professional modern dance company, a serious knee injury interrupted Klein's ambitions. Klein Technique is the result of Klein's personal healing journey that led to her new understanding of the dancing body (2005). Klein opened her school, the Susan Klein School of Movement and Dance, in downtown Manhattan in 1979. Soon after, she embarked on a long journey of studying bodywork from both the eastern and western traditions. She holds an MA in Acupuncture from The Traditional Acupuncture Institute in Maryland and presently serves as a Diplomat in Acupuncture for the National Commission of the Certification of Acupuncturists and Oriental Medicine. In addition to teaching at her school in New York, Klein also teaches annual international workshops and has maintained a private practice as a movement therapist, certified Zero Balancer and Worsley Five-Element acupuncturist, treating dancers and non-dancers since the mid-1980s. For the last ten years, she has worked with Sasha Waltz and Guests in Berlin, Germany as both a movement therapist and master teacher (Klein 2016).

Klein's technique has been influenced profoundly by physical therapist and dance therapist pioneer Irmgard Bartenieff, in addition to chiropractor Barbara Vedder D. C., osteopath Fritz Smith M. D. and Worsley Five-Element acupuncturist J. R. Worsley D.Ac (Klein 2016). After Klein suffered a knee injury, she met Bartenieff while studying Bartenieff Fundamentals, Labanotation and Laban Movement Analysis at the Dance Notation Bureau (Klein 2016).⁶ Bartenieff's work, *The Bartenieff Fundamentals*, inspired Klein's work theoretically and practically (Bartenieff 1980: 236, 238, 243). Perhaps one of the most profound influences Bartenieff had on Klein was her application of 'thrust and counter-thrust'. Bartenieff believed that without a kinaesthetic understanding of the concept, a dancer would jeopardize their 'connection' or relationship to space and the ground. She argued that it was a loss of connection that was the root cause of many musculoskeletal injuries, citing that her injured patients did not improve by strengthening specific muscle groups (Bartenieff 1980: 3, 114). Continuing Bartenieff's legacy and tired of seeing young dancers injured or reaching a technical plateau, Klein codified her approach and trademarked it Klein Technique™ (Klein 1996). Eventually, Klein developed her own signature style of teaching and later, a teacher certification process. Her method offers dancers a theoretical and practical underpinning independent of a choreographic style or aesthetic agenda to improve technique, athleticism and virtuosity and heal and prevent injury. To achieve this, Klein took from her experience and applied various theoretical principles from her formal studies to address alignment, teaching dancers how to re-pattern unproductive movement habits by working on what she calls 'the level of the bone' (Klein 2016).

SHIFTING PARADIGMS: KLEIN TECHNIQUE THEORY

Through both her formal education, private bodywork/acupuncture practice and experience as a dancer, Klein has concluded that a greater emphasis should be placed on changing the relationship of the bones to each other relative to the ground and space. As previously discussed, this perspective is generally contrary to current and popular trends in dance pedagogy that focus

6. The Dance Notation Bureau became the Laban Institute of Movement Studies in 1978 and is now called the Laban/Bartenieff Institute of Movement Studies (LIMS 2009).

7. Power in Klein Technique is understood in part as 'muscular balance', meaning one achieves and increases their power and therefore movement potential not by strengthening muscles through isometric exercise but by recalibrating them through mindful, focused, task-based exercises and stretching. To reiterate, this is achieved by using the mind to channel gravity through the bones – the denser body tissue, so that the muscles – the less dense tissue, can reorganize around that force. This order of operations results in increasing coordination, which Klein believes is more applicable than increasing strength.

on building muscular strength using the CS approach to improve performance and address and prevent injury. Klein does not believe technique or virtuosity is impacted negatively by a 'weak' core. She prefers not to equate musculoskeletal issues with muscle weakness; instead, she measures a dancer's functional success on coordination which she attributes to alignment and the ability to use muscle relative to movement. In Klein Technique, dancers make adjustments to their alignment independent of aesthetics, but with consideration of gravity. To further explain the interaction between alignment and gravity, consider the following metaphor from a biomechanist Katy Bowmen:

If you drive a car you've probably had to have your wheel alignment – not wheel posture – adjusted at some point. In this case, your mechanic is not finding the most attractive position for a wheel. In fact, wheel alignment is not about static positioning at all but how once moving, the interaction of a system – the road, the wheels, the tire, suspension components, etc. doesn't inflict excessive damage on any single part making up the system. To find optimal wheel alignment, the mechanic must consider the material fatigue points, the forces created by the speed, terrain, tire pressure, etc. In short, alignment includes the consideration of forces or said another way, posture is the visible orientation of parts, and alignment encompasses the invisible forces created by particular movements.

(2014)

Unlike the term *posture*, *alignment* implies a consideration of force when making adjustments to the body (*Merriam-Webster Dictionary* 2015a; 2015b). Despite gravity being an 'invisible force' such as the wind, it has the ability to shape even the densest tissue in the body – bone. Klein Technique teaches students how to innervate the deep muscles of postural support (which Klein considers to be the psoas, hamstrings, six external lateral rotators and pelvic floor) by directing gravity through specific bone landmarks to balance the muscles, which she argues can only be achieved if the superficial muscles are not actively contracted. An emphasis is placed on the skeleton, because bone is the deepest, densest structural tissue in the body and therefore conducts the most energy. If you direct energy through the denser tissue, the less dense tissue – the muscle tissue – must reorganize around the denser tissue – the bone. She theorizes that this balancing act and the consistent practice of it increases the clarity of a dancer's *connections*. Improving connections largely depends on how grounded one is, which Klein attributes to how well one leverages off from the floor through the bones to move.⁷

To educate the body on how to leverage off from the floor, Klein requires students to start with her foundation class, Stretch and Placement. The class teaches the method's fundamental principles, including the *roll down* – a cornerstone exercise she says holds 'the essence' of the technique (Klein 2016). In the beginning, the aim is to encourage students to let go of their superficial muscles so their body may learn how to access their deep muscles of postural support. Klein has come to the conclusion that the deep muscles of postural support are best accessed by negotiating force through specific bone landmarks instead of attempting to specifically target and contract them. A Klein teacher uses simple and clear directive commands to teach task-based exercises using specific prose. An example of this kind of direction may be how a Klein teacher asks a student to straighten their legs, directing them to

‘connect your sitz bones down through the centre of your heels and into the floor to the push the floor away to straighten your legs’. Klein warns that over-contracted superficial muscles, particularly the quadriceps, glutes and core, can limit a dancer’s range of motion. While there are certainly many contemporary dance teachers that incorporate anatomical terms and somatic approaches in their technique classes, I have yet to come across a technique specifically created for dancers that is as thorough and clear in instructing students how to mechanically execute common exercises in both contemporary and ballet technique without relying on imitation or mimicry. As Klein considers the *roll down* to encapsulate her work’s essence, a detailed description of the exercise is outlined below to help the reader understand how the method teaches one to leverage or push off from the floor to improve function.

THE ROLL DOWN

The roll down begins with a standing meditation. Students are asked to place their feet into parallel directly underneath their hip sockets as the teacher brings their awareness to their skeleton by outlining specific bone landmarks. Of particular importance is setting up the *primary connections* or relationships between specific bones, space and the ground in an effort to direct the forces of gravity (Klein 2016). The first is the connection between the ischial tuberosities or *sitz bones* through the heels and into the floor. This connection innervates the hamstrings to balance and work equally and evenly, which helps to right the pelvis on top of the legs in the vertical plane. The second is the connection between the coccyx or *tailbone* and the heels into the floor.⁸ Students are asked to connect their tailbone down and slightly forward towards the heels to further lengthen the spine down towards the floor. This connection helps to right the pelvis on top of the legs in the sagittal plane and to increase the connection between the legs and the floor.⁹ By establishing the primary connections, the pelvis is brought more on top of the femur heads. In order to honour the pathway of gravity for the sake of efficiency, the pelvis must be on top of the legs to act as clear conductors for gravity to channel through and reach the ground as directly as possible. Creating a direct path for gravity to flow through the bones to the ground increases a dancer’s capacity to leverage successfully from the ground (Klein 2016). Many teachers use CSE to correct anterior and posterior pelvic tilts, however, Klein argues that the CS approach only addresses the body on a surface level, training students to correct pelvic alignment by contracting superficial muscles instead of changing inherent structural issues (Klein 2016). If the pathway to the ground is not clear, meaning the pelvis is off the legs or the body weight is held up off the ground, one will inevitably end up leveraging off their own body to move. While one can certainly still move this way, the scenario will eventually prove to be problematic for dancers, because their arena requires the body to operate at such a high functional capacity, there is no other choice but to leverage off the ground (Klein 2016).

Once the primary connections have been established, the roll down sequence begins. Students place the palms of their hands on the sacrum with their fingertips pointing down towards the tailbone, rolling down slowly in eight counts from the crown of the head to what is called *halfway* in Klein Technique. Halfway is different for each person, therefore students are instructed to stop moving forward as soon as they feel the pelvis begin to shift back and off the legs. The purpose of halfway is to develop a sense of

8. The primary connections come from Bartenieff Fundamentals. However, Bartenieff only talked about connecting the sitz bones through the heels, while Klein added the floor to the equation. Klein also added connecting the tailbone slightly forward and down towards the heels during practice, while Bartenieff’s contribution was connecting the tailbone to the pubic bone (Klein 2016).
9. Klein deliberately chose to refer to the ischial tuberosities and coccyx by their colloquial names to make anatomical terms more familiar (2016).

10. Klein Technique primarily focuses on the pubococcygeus, a hammock like muscle that connects from the pubic bone to the tailbone (coccyx), which is part of the levator ani muscle, one of three major muscles that create the pelvic floor (Klein 2016).

where the pelvis is in relationship to the legs, to play with thrust and counter thrust, to amplify the connection between the sitz bones and the heels and to stretch the muscles of the back at the bottom of the rib cage (Hamwee 1999: 75; Klein 2016). Leaving one hand on the tailbone while the other hand is placed on the front of the pubic bone, students are asked to breathe into the space between their hands, feeling the effect of the reparatory diaphragm on the pelvic diaphragm (Klein 2016).¹⁰

Next, students are asked to drop their arms and let go of any held tension in their torso. As the weight of the head and torso gradually move forward and down, students must counter-thrust or counter balance their body weight by shifting their pelvis off their legs, anteriorly rotating the pelvis on top of the femur heads as the sitz bones thrust down or connect through the centre of the heels and into the floor. Shifting the weight back through the hip sockets is crucial, because it teaches the body that grounding comes from the relationship of the hamstrings to the floor (Klein 2016). Students are asked to let the front of their thighs or quadriceps 'hang down the bone' in an effort to increase the use of the hamstrings. Time is spent hanging over the legs stretching to both rebalance the hamstrings around the bones and to teach the legs to carry the weight of the torso. At this point, the teacher encourages students to 'let the torso go' by breathing deeply. In the beginning, this is very difficult for students, as most, even experienced dancers, are not accustomed to truly dropping their weight through their legs into the floor.

To return to standing, students are asked to bend their knees out over their feet and rest their chest on their thighs. To amplify the connection between the sitz bones and the heels into the floor, students perform small *pulses* (the pulses look like small bounces and are initiated from the sitz bones) to further drop their weight. Taking a deep breath in and directing the exhale out the tailbone, the students are asked to carve up to standing slowly in sixteen counts. The *carving*, or small thrust forward, is initiated from the tailbone. The initiation begins from the tailbone, because it is the very end of the spine. Utilizing the spine as a lever in this position, it is most efficient to right the pelvis back on top of the legs by moving from underneath the pelvis so that the forces move sequentially through the pubic bone, through the knees, into the ankles, into the feet and into the floor. Just before the tail propels the body forward in to movement, the teacher commands to connect the sitz bones down through the centre of the heels into the floor, deliberately asking students to use their legs – not their upper body – to counter-thrust or push the floor away to return to standing.

To end the sequence, students are asked to perform shoulder and head circle exercises to challenge keeping their pelvis on top of their legs as the torso moves while applying thrust and counter-thrust. After a roll down, the pelvis is more on top of the legs and therefore more connected to the floor, which increases the ability to leverage off from the floor. Consequently, this relationship increases one's efficiency and technical potential (Klein 2016). If the pelvis is off the legs posteriorly or anteriorly, the forces of gravity do not have a clear path to follow. Power, range of motion and ease of movement are directly proportional to the relationship between energy (gravity) and structure (the skeleton). When this relationship is fine-tuned, the level of virtuosity a dancer can achieve without compromising function expands and the risk of injury decreases (see Allen 2009; Emslie 2009 and Glaser 2015 in 'Further Reading'). In addition to Stretch and Placement, Klein

also offers Technique, which combines contemporary dance centre floor work and ballet barre exercises taught using Klein theory to teach students how to execute traditional movements from a functional and anatomical perspective.

CONCLUSIONS

This article sought to explore the inclusion of CSE in contemporary dance technique and whether it serves dancers by improving technique and preventing injury. If teachers want to include a practical or theoretical component that exclusively addresses function, Klein Technique™ is a suitable and helpful method, because it is designed to help dancers change their alignment independent of aesthetics, which gives dancers time to exclusively devote their attention to function. Releasing often habitually held superficial muscles in a quiet, slow-paced class environment also gives students the opportunity to re-pattern and let go of movement habits that are no longer serving them. Dancers learn that it is not individual muscle strength that makes one strong, but putting the body in to a connected relationship as a whole and with space and the ground. This kind of approach gives students the chance to improve their technique and virtuosity and heal and prevent injury, which could extend their performance career. For these reasons, the dance community should consider Klein Technique to serve as an underpinning for contemporary dance technique and question whether the CS approach provides a theoretically sound, long-term solution for dancers.

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CONTRIBUTOR DETAILS

Sara M. Salvitti has taught Klein Technique™ at Rutgers University, PACE University, the former Dance New Amsterdam, the Susan Klein School of Movement and Dance and at CENADAC in Querétaro, Mexico. She was certified in Klein Technique™ in 2015 after studying with Susan Klein for nine years. In addition, Sara was a former adjunct professor at Mason Gross Arts Online at Rutgers University where she taught Dance Appreciation Online for three years. She received a BFA in dance from Rutgers University in 2007 and an MA in dance anthropology from Roehampton University in 2010.

Contact: Rutgers University, 85 George Street, New Brunswick, NJ 08901, USA.

E-mail: saramsalvitti@gmail.com

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