
There is now an extensive body of research on the topic of cardiovascular fitness and dance. In this comprehensive review paper the authors have summarized the results of numerous research studies that a) documented the CV fitness levels of dancers, b) examined the physical demands of dance performances, and c) proposed and evaluated supplementary fitness programs for dancers. They present the results of ten studies of the cardiovascular responses of dancers and found different physiological capabilities due to levels of experience, age and gender and, not surprisingly, according to dance form. The specific cardiovascular demands of different dance forms were reported from six studies, looking at performance demands in ballet, modern, jazz, tap, ballroom and aerobics and comparing those to class and rehearsal. The studies report much greater CV demands of performance and a concern that increased injury is possible due to dancers’ fatigue and lack of strength. Overall, dance classes are not physically demanding enough to train dancers’ fitness. While the center-floor section of the class appears to increase the intensity somewhat, the exercises are usually too short with a long rest periods. To deal with this divergence between class and performance demands, supplementary aerobic and strength training has been recommended and evaluated in six studies. Including additional fitness training within or supplementary to technical classes however is not an easy task. The choice of both dance fitness assessment protocols and training programs must be specifically adapted to the intermittent nature of dance characterized by a mixture of short series of explosive movements and sustained adagio demands. It also must be individualized to the dancer’s physical capabilities, experience, dance style, and role in the company. It may however be difficult to add even a once a week supplementary fitness training to the already heavy physical and time demands of technical classes, rehearsals and performance. If this is not possible, there are recommendations for integrating fitness training within the technique class by developing a continuous, medium intensity warm-up routine as well as increasing the duration or repetitions of center-floor exercises and decreasing rest time in between. The most effective training would appear to be High Intensity Interval Training (short bursts of high aerobic intensity exercise followed by short rest). An example offered is a 5-minute routine including 3 sets of 20-second sprint-like exercises such as sautés, followed by 2 minutes of active recovery such as a grande adagio sequence. This type of training appears to more closely mirror performance demands. Results from studies suggest that the time and effort expended for increased fitness training appear to be balanced by improved technical and artistic performance capabilities and injury prevention. The authors suggest it would be worthwhile for instructors and choreographers to consult fitness specialists to design a dance appropriate assessment and training regime suited to their dance form and the particular needs of the dancers.


To follow the previous review, this study provides an illustration of the positive effects of a supplementary fitness program on contemporary dancers. Studies have indicated that in general dancers are not as fit as other athletes, and their class and rehearsals do not provide sufficient training for the cardiovascular and muscular power and endurance demands of performance. In modern dance these include repeated jumps and pliés per minute, frequent transitory movements to and from the floor, lifts, and high intensity bouts of movement with limited recovery time. A 6-week program that included two one-hour sessions per week of circuit training and whole-body vibration was developed and administered to half of a group of twenty-four female adult modern dance students and professionals. The other half (control group) participated in two extra one hour
pliés using correct alignment. Twenty experienced adult bal-
erers presented with medial misalignment when the knees
were not correctly aligned in the pelvis. During the plié the
pelvis was in neutral position (which the authors defined
as pelvic angulation between 12 and 15 degrees) when the
knees were extended but was in retroversion (defined as
less than 12 degrees) in the majority of dancers during the
plié. In terms of knee-foot alignment, on average the danc-
ers were not able to stay correctly aligned in their lower
limbs according to the ideal plié criteria in the literature
for classical ballet. This study has provided a methodology
for carrying out a kinematic evaluation of the plié useful
for dance researchers. For the dance instructor, the authors
have provided a detailed description of the correct align-
ment in each area and have clarified the contribution that
each aspect of misalignment can make to possible muscle,
ligament and joint injuries, thus reinforcing the need to
pay careful attention to correct alignment.

Henley MK. Comparison of shape, space, and time
judgments in expert dancers and novices. Evidence

In most dance classes, instructor demonstrates a new skill
or sequence for the students. The students then have to
retain that image in memory in order to try to reproduce
it for the first time. That means they have to identify the
physical action performed, e.g. a jump, as well as observe
the shape of the body and limbs, the direction or level in
space, and the duration of the movement. Can one assume
that experienced dancers would be more accurate observ-
ers, overall or of just some components? This study reviews
neuroscience theory on visual processing, specifically the
action/perception link to make the connection between
dancers’ experience and ability to perform an action and
their perceptual ability as background to an experiment on
dance observation by novice and expert dancers. The mate-
rial developed for this study were 32 movement phrases,
each composed of a series of four actions consisting of
gross motor skills such as walk, jump, and balance. Each
action had a unique configuration of arm, leg and torso,
i.e. a shape, but was not recognizable as any codified dance
movement, which would have provided a clear advantage
to the experts. These same phrases were then manipulated
so in one of the four segments, either the body shape, dura-
tion of movement or direction was changed, or no changes
were made to any of the segments. Twenty experienced
and 20 novice dancers were presented with these 32 pairs
of phrases, the original and then the manipulated phrase and asked to identify if the two phrases were the same or if they could identify a difference in shape, time, or direction. There was no difference in the ability of novices and experts in identifying the shape differences in the phrases. However, the expert dancers were significantly better at identifying the time, direction or no difference phrases. The author suggests that while novices were able to remember the shapes, the experienced dancers at the same time also encoded time and direction. They had repeated past physical experience learning movements by connecting a movement’s shape, direction and duration and that they were able to code them through a shared mechanism. From reading this study, one can perhaps extrapolate some suggestions for teaching a dance phrase to novices in order to help them form these links so they try to match shape with space and time.