



Update

Hello!

I hope you are surviving the crazy winter! My Milano Senior Center classes have gone into a second round of Tai Chi for Arthritis and Fall Prevention. It is now a mixed ability class with some new learners and some who are now learning higher level techniques. My online 24 Forms class is progressing well.

In my skating activities, I am excited to be participating in two performance numbers in an upcoming ice show: Ice Chips Full Throttle, featuring Nathan Chen. For more info, please visit icechips.org.

Key Insight - Walking On Bricks!

In this issue of the newsletter, I'd like to talk about an advanced technique in tai chi. It is the technique of pushing down to initiate a weight transfer. People usually think about pushing backward to move forward and vice versa for moving backward. However, as we advance in our tai chi techniques, we should focus more on pushing downward.

From a physics perspective, we rely on the ground reaction force generated under our feet (or weighted foot in tai chi or skating foot in skating) to provide the motive power. We also rely on friction between the ground (or floor) and the bottom of our footwear. For skaters, it's the resistance between the ice and the side of the skating blade. The combination of this ground reaction force and friction/resistance are what drive movement.

As students begin learning Tai chi or skating, they tend to rely more on the horizontal friction/resistance forces to move. In a forward step, the Tai chi student pushes on the weighted foot, mostly focusing on the backward force. Similarly, to skate forward, the beginning skater places one blade sideways behind the foot that they intend to skate on, and pushes back. As they advance, whether in tai chi or figure skating, the push should be more focused on the downward force, as this produces a larger ground reaction force to provide more power to the movement. How much more should this vertical force be?

To provide guidance, Dr. Yang, Jwing-Ming teaches an exercise of walking on bricks that have been laid upright (i.e., the long dimension is placed vertically). See my demonstration in the attached photograph. The downward force must be much higher than the horizontal force, such that the upright brick is not toppled when pushing to step forward or backward. The goal is to practice until one is able to quickly shift weight forward and backward without toppling the bricks. This exercise is not suitable for those who may easily twist their ankles when falling!

How does one walk on upright bricks without toppling them? The key is in the core muscles to keep the upper body firmly over the weighted foot and the use of the muscles of the middle control zone to control the weight shift. Instead of pushing directly back from the leg, which would topple the brick, the transversus abdominus activates to straighten the lower back and push downward. The gluteus medius then activates to initiate the forward motion while continuing to press down. This muscle activation sequence is similar in figure skating, where the skater initiates the push by first pressing down (often lowering the torso to provide more downward force) and then pushing back using abdominal and gluteus medius muscles.

Why is this approach better than focusing on a large horizontal force from the beginning of the push? Firstly, activation of the muscles for pushing down also firms up the central control zone which connects the upper and lower parts of the body. Lack of muscle activation in that area is the reason why some beginner skaters' upper bodies lurch forward after a push. For tai chi beginners, if there is insufficient activation of the central control zone, their upper bodies lag slightly behind during a forward shift.

Secondly, the activation of the gluteus medius and abdominal muscles for generating the horizontal component of the motive force allows for a much better control over the direction of the force than when horizontal force is generated from the leg pushing horizontally. Perhaps this is because they act closer to the center of mass of the body.

Finally, pushing downward to initiate weight shift is part of tai chi rooting techniques which provides much more power and stability than mere balancing. Power and stability is also achieved on pushing downward in figure skating.

In conclusion, as you progress in your tai chi journey or figure skating training, consider focusing on the downward force as you shift weight or stroke.

With Warmest Regards,

Vincent Chun



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