

Pilates: The Irrefutable Truth

Robert Morrison CFP

Pilates is an exercise method developed in the early part of the 20th century by Joseph Pilates. Originally used to rehabilitate dancers, it has found growing popularity in the commercial gym sector of the fitness industry. It has, in effect, and due to intense marketing, been the largest growing exercise method in the past decade. Yes, it sells; but is it really doing as it claims?

In this critique, I will look directly at the principles of Pilates movement as it pertains to floor exercise. I won't enter the area of the "Reformer" as I believe that would take a critique in itself, and has already been touched upon in other critiques.

Strength Training, Identity, and Requirements

In the context of human movement, strength can be defined as *a measure of force produced by the tissues*, i.e., nervous, muscular, and tendonous, and whether to exert or resist. In essence, the demonstration of strength is a demonstration of force, and this is true whether speaking isometrically or dynamically.¹

From the practical experimentation of many trainees and scientists, it has been shown that strength training through vigorous muscular activity produces increases in muscular force output only at the points trained, i.e., strength training is specific. This is known as a type S (specific) strength curve. This also is true for the majority of the population, although there are the selective few who will experience a 'carry over' from partial-range strength training and to full-range force output. These individuals would possess what is known as type G (general) strength curves. Even then, Type G individuals/muscles still produce the best strength gains by way of training the entire range-of-movement.

With that in mind, it can be hypothesized, and it has been proven, that in order to train a muscle effectively for strength through its full range, the muscle requires adequate stimulation through a full range of possible movement. This can be done selectively, as in Zone Training™, or generically, through regular repetition work with a suitable exercise for a select muscle and joint function.

"Exercise does not PRODUCE physiological improvement, increases in muscular size and strength; instead exercise STIMULATES physiological changes. But any actual improvements that follow is a result of the body's response to that stimulus provided by exercise. The things you can be, the limits of your potential size, strength, intelligence and several other things, were determined before you were born, were dictated by your genetics; but what you will be is largely determined by stimulation provided by experience."

Arthur Jones

And so, what is the deal with Strength and exercise?

¹ From Strength's Identity, *Muscleaneous: Flexing the Philosophical Muscle*, by Brian D. Johnston

There are many exercise methods that do not fulfill the above requirement. They include Static Contraction Training (the holding of heaving loads at select points), a method championed by Pete Sisco, and Swiss Ball and Functional training by Paul Chek, among others. The list also includes Pilates, as its main directive is ‘Core Strength’², which aspect then supposedly develops a stronger body.

“A is A.... Nature, to be commanded, must be obeyed.”

Ayn Rand

The crux of the problem with all of these activities is that they do not provide muscular tension through a full-range of joint motion. In that regard, they can be considered partial-range training, or strength training at specific points of a muscle’s range. This leaves many areas untapped, with insufficient stimulus to improve strength as much as it could. As it pertains to the subject in question, Pilates, most of the movements revolve around static holds and little, if any dynamic movement of the abdominals and ‘core.’

The Flexibility Quandary

Flexibility is limited by several factors, including bony delimitations, any present arthritic conditions, muscle belly length, body fat distribution, as well as the ligaments and/or joint integrity. For most, flexibility (like muscular size) has a genetic potential, limited by the above factors. Pilates emphasizes flexibility, and yet what actually happens when someone stretches beyond the limitations of the muscle belly? The tension is transferred to the tendon and then precariously, the joint ligaments. No one can achieve to the same degree of flexibility, and trying to go beyond what is required for individual function³ is dangerous and pointless. Fundamentally, muscles cannot ‘lengthen!’ What often is ignored is that flexibility can be improved through either 1) full range of motion weight training, or 2) selective work at the point of stretch, both performed in a safe controlled manner that enables a trainee to gauge the limits of a stretch safely.

“A building has integrity just like a man. And just as seldom.”

Ayn Rand

Motion and Skill Factors in Pilates

In order for a muscle to be targeted effectively, it must be involved in an exercise’s motion directly. That is, it must be the prime mover, or at least a true synergist.⁴

Any other directive requires other muscles to become involved to a greater degree depending on the chosen exercise. It also promotes unloading, or reduction of tension on the assisting muscles (as it should be when exercising with intent and a specific objective). However, in Pilates’ case, the assisting muscles are the abdominals. They are, at best, working statically, accumulating fatigue at that specific point. And so, how can unloading the prime movers by trying to distribute tension to the assisting muscles (indirectly involved), result in increased strength in said muscles?

“it is impossible to understand anything that you cannot measure; and thus it unavoidably follows that you cannot determine the results of any action until you can accurately measure any such results”

Arthur Jones

² A reference to ‘midsection (abdominal, lumbar spine) strength,’ coined by Paul Chek. It claims an increase in ‘core strength’ provides a more “functional individual,” with less risk of injury through sporting and daily activities.

³ Activities of daily living dictate how much flexibility is required. I am not overly flexible, yet I bear no ill effects.

⁴ A Prime mover is a muscle that causes a direct action of the intended joint movement. A synergist directly supports the prime mover, as the triceps and pectorals operate during a push-up movement.

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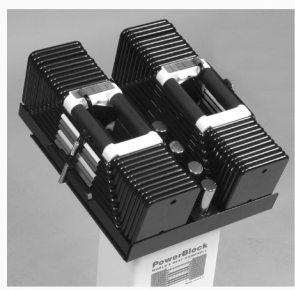
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This is one of the unavoidable questions of the Pilates method...

Pilates' answer is to be consciously aware of one's abdominals and core while performing the sophisticated movements – to have them 'activated,' or with *Contrology*.⁵ This can be performed in any activity, Pilates or not. When a trainee is performing a challenging and skill-based movement, it is not possible to contract the abdominal muscles fully while trying to initiate leg or arm movements simultaneously. This is due to the nervous system being capable of controlling only so much muscle at once. The greater the skill requirement, the less focus on any individual muscle. For example, try a push up (a dynamic movement) while trying to hold one leg off the floor in a controlled manner. Difficult? Of course it is, and you certainly will not achieve the same fatigue/inroad of the chest muscles as you would if the legs both were firmly on the floor.

And so why is Pilates championed as the best exercise for the midsection? Why are professionals such as physiotherapists now using the method? In brief – skill. Motor skill improvement in exercise occurs rapidly and within a few sessions/weeks of practice of a new movement; consequently, 'measurable' (yet subjective) improvement can be observed quickly by both client and physiotherapist/instructor. This gives the impression that improvement of some nature is occurring, since the client now can perform a more physically challenging maneuver, or can hold a balanced position for longer. Note that this is not an objective measure of strength or improvement in tissue architecture. It does not refer to what degree the maximum force output of the core muscles has increased.⁶

I recently learned to swim. Swimming is skill based on coordination of movement between arms and legs. Of note is that over a few lessons, I improved swimming capabilities by a noticeable degree. I now can perform the difficult coordination factors of swimming and stay afloat. And so, is this an increase in strength in my arms and legs? Absolutely not. If that were the case, I then would notice increased strength in the gym when challenged with unlike (swimming) movements or mechanics. The most the swimming practice provided was minute cardiovascular improvements because of the breathing methods and adaptation to unfamiliar movements.

Returning to the point in question, skill and difficulty of performance has far less bearing on muscular fatigue and inroad (to induce physical change) than some experts content. Pilates largely is skill based. It also is based on limited abdominal movement and, therefore, reduces its effectiveness in strength increases of the abdominals.

"Pilates emphasizes the easy and fun social setting over the exercise requirement for control and hard work"

Brenda Hutchins, why not Pilates? critique

⁵ 'Contrology' is the term coined by Joseph Pilates, referring to control of the Abdominals.

⁶ The only way to test abdominal strength is via a force gauge (even then the results will not be 100% accurate due to limited ability to isolate trunk flexion properly). Experienced instructors may be able to modify and substitute an existing machine or use load as a measure. However, the primary constraints are the removal of stored energy torque and effects of gravity, both of which skew the results, which is why static testing is necessary.

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"Nothing has been given to me."

Freddy Adu (footballer)

Of note is the fact that Pilates originally was used to rehabilitate ballet dancers, as per the introduction to this paper. This is due to the movements having at least some relationship to the movements used by dancers in practice. It does not, however, relate to the average individual who takes a Pilates class and the unlike movements experienced outside a Pilates class. This is not to suggest that some strengthening and conditioning does not take place, but that the extent to which this occurs is far more modest than the industry believes and with far better methods available to enhance an individual's physical function.

Why are Motor Skills so Relevant?

Well, as a brief review, motor skills learned by practicing specific movements are done in order to develop improved capacity to demonstrate ability at said skill. They are classified as either open skills or closed skills. Closed skills are correctable as the movement progresses. Open skills are not (e.g. golf swing). While both can be practiced and improved upon, skills that have a degree of certainty (closed skills like slow Pilates moves) are worlds apart from open skills (uncertainty). And yet, Pilates claims its closed skills are helpful towards the unpredictability of movement in daily life, e.g., slipping on a wet floor

The Claims and the Fallacies

The following is a list of some common Pilates quotes and comments in reply. Where possible, sources of the quotes are listed.

"Students quickly find the benefits of proper movement patterns as they carry themselves into everyday life, from performing the most simplistic tasks such as picking up heavy groceries or climbing a flight of stairs to skiing, horseback riding, golfing or walking on an icy path. In addition, the body becomes long, lean and strong. The benefits are never-ending" ...[source:www.mindfulmoves.com](http://www.mindfulmoves.com)

"So you think that money is the root of all evil. Have you ever asked what is the root of all money?"

Ayn Rand

The above statement makes the assumption that the Pilates student will improve daily movements through Pilates moves. Absolutely false, as each motor skill pattern learned by the nervous system is specific to each task. This is one of the most common fallacies in the fitness industry, touted by many, including Paul Chek and Pavel Tsatsouline.

It also states that the body becomes long, lean and strong. How can the body become long? Am I going to grow taller with Pilates? Great, and if that was the proven case, I'd be well versed in its methods.

Now, how will the body become lean (below average body fat) by Pilates alone? Nothing is mentioned of a nutrition plan or other methods. Only that practicing Pilates will, without any doubt, result in a lean body. What about genetic factors, body type, and habitual constraints such as overeating. The strength claim is highly disputable, since it is subjective (how strong?) and with little mention of how it is measured... by skill improvements?

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Of interest it also mentions walking on ice (an open skill) as being linked to Pilates moves (closed skills due to the slow movements involved). Hence, how prepared is the general person for a fall on a slippery surface? In most instances of falls, the fall already has begun before it can be corrected.

“Pilates heals the body” [source:www.mindfulmoves.com](http://www.mindfulmoves.com)

An absurd claim; the body heals through rest and correct nutrition, and through complex devices of the immune system (for example). Not through exercise (which is a stressor). Exercise can enhance the immune system, to make the body stronger in order to heal the body in times of crisis, but it does so by stimulating such a process.

“Pilates Lengthens muscles” [source: www.performancepilates.com](http://www.performancepilates.com)

The most absurd claim of all, a muscle’s length is fixed and pre-determined genetically. One can increase range-of-motion due to adapting to a movement, but one cannot lengthen or change the genetic constraints of a muscle.

“You will feel better in 10 sessions, look better in 20 sessions, and have a completely new body in 30 sessions.” [Source: Joseph Pilates](#)

If this is a claim, then where is it proven? How many people who partake in Pilates have a completely new body in 30 sessions? What is defined as a new body? (Obviously even a 1% improvement in function and health could be considered having a ‘new’ body, but most exercise enthusiasts would deem the term ‘new’ to be of a significant change.) But consider someone who has experienced more demanding methods of exercise, such as a bodybuilder; would that person make more progress or better progress with Pilates?

Also, as a bodybuilding enthusiast, will I now change my body more than through intense, physically demanding training with the use of weights and machines? I rarely perform direct abdominal work; yet maintain measurably strong, flat abdominals. Compare the effort and loading performed in Pilates and weight training. If Pilates can claim to overload the abdominals indirectly, what does heavy pressing, pull-downs, squatting, etc., do? Any benefit likely is amplified greatly through heavier training methods; and even so, the strength of my abdominals at untrained areas still regresses quickly when not stimulated. Hence, am I less functional than a Pilates trainee? Pilates provides no answers, theory or proof to the contrary.

“Pilates works with muscle resistance in the way muscles are designed to function, not against natural mechanics” [Source:The Back Pain Sourcebook by Stephanie Levin-Gervasi](#)

Why is non-pilates exercise considered the use of muscles in an undesigned way? Muscle mechanics dictate regular exercise function – unlike partial-range Pilates movements, which shift tension unequally among muscle groups. The function of a muscle is intrinsic to its nature; a muscle like the rectus abdominus flexes the torso as its primary function, and helps to stabilize the trunk otherwise and as a reduced capacity.

“The commercial health and fitness industry is full of all types of quick fix schemes, making it frustrating to know what to believe in or trust.”

Lee Haney

“I am a coach on the outside of the establishment and that works.”

Linford Christie

The Novelty, the Aspirations, and Group Exercise Factors

Social factors often take precedence in fitness class marketing; if a system is novel it appeals to the emotionally influenced. After all, if the majority is doing it (what is popular and for whatever reasons), then it must be right? This social aspect also resulted in the 80s 'step generation,' many of whom now possess knee and hip complications. Pilates may not have the same impact risk factor, but for the time and duration that is spent 'practicing,' it has a very poor cost-benefit ratio.

Many are drawn to Pilates because of its almost universal acceptance by physiotherapists and physicians. People are influenced strongly by such quarters and often believe the above professions to be infallible, trusting their exercise recommendations, whether productive or not.

"To be physically fit is just a small aspect. You can be a beautiful physical specimen, but you're empty as far as what it takes to be a person, and that shows up real fast. "

Lee Haney

The Pilates marketing machine leaves a lot to be desired. From its humble beginnings of helping ballet dancers, it now is touted as a cure-all. This false representation has initiated many to succumb to the marketing ploys of the various Pilates organizations. People join with hope that low energy levels, back pain and various injuries will be fixed. In the majority of cases, that simply is not true.

This is evidence that Pilates uses emotions as a ploy to get people from all backgrounds to sign up to its doctrine. It widens its market as it is claimed anyone in any area can be helped. Why is this done? Money, pure and simple.

Pilates Principles

Centering, Concentration, Control, Precision, Breathing, and Flowing Movement. Adapted from www.wikipedia.org

Breathing

"Keep breathing. "

Sophie Tucker

"Joseph Pilates believed in getting the blood pumping so that it could awaken all the cells in the body and carry away the wastes that are related to fatigue. For the blood to do its work properly, it has to be charged with oxygen and purged of waste gases through proper breathing. Full and thorough inhalation and exhalation are part of every Pilates exercise. Pilates saw forced exhalation as the key to full inhalation. "Squeeze out the lungs as you would ring a wet towel dry," he is reputed to have said. "Soon the entire body is charged with fresh oxygen from toes to fingertips, just as the head of steam in a boiler rushes to every radiator in the house"

"Millions of dollars' worth of advertising shows such little respect for the reader's intelligence that it amounts almost to outright insult. "

James Randolph Adams

Author's Reply: The oxygen uptake of the human body is dictated by the demands imposed. Pilates is not a cardiovascular intensive activity and is unlikely to provide such demands unless a trainee is much deconditioned. Also, the body will only take on board so much oxygen – as much as is required. Breathing deeper will not force the body to uptake a higher level. Biology and Physiology are two areas that are constrained by physical laws of identity, and principles of cause-and-effect.

Centering

Pilates doctrine calls the large group of muscles in our center – encompassing our abdomen, low back, hips, and buttocks – the “powerhouse.” All energy for Pilates’ exercises begins from the powerhouse and flows outward to the extremities. Physical energy is exerted from the center to coordinate one’s movements. In this way, a strong foundation is built upon which to rely in daily living.

Authors Reply: The powerhouse that Pilates described is a good play on imagery – nothing more and nothing less. The energy for an exercise comes from the muscles initiating movement. This is part of a muscle’s identity. The next statement is absolute hoopla; a “strong foundation” for daily living is built by training the muscles to get them stronger – to produce more force. More force = more function; more muscle mass = more joint stability.

Concentration

You have to concentrate on what you are doing. All the time. And you must concentrate on your entire body. This is not something you’ll be able to do when you start, because it’s harder than you think. Once you really begin to pay attention to your body, you will find that a movement that may have seemed simple actually is quite complex.

“For me, it is far better to grasp the Universe as it really is than to persist in delusion, however satisfying and reassuring.”

Carl Sagan

Author’s Reply: This is why Pilates is skill training and not strength training. Trainees concentrate on the movement and inter-muscular coordination, while the focus and tension shifts from the target muscles. It’s “harder than the trainee thinks” because it is a new skill. Once the skill is mastered, which has more to do with coordination than strength increases, the trainee progresses to a more challenging position and the process then repeats.

Control

Pilates training teaches complete muscle control, and there are no sloppy, haphazard movements in this method. Thorough concentration is needed in order to be in control of every aspect of every movement. This applies not just to the large motions of limbs, but to the positions of fingers, head, and toes, the degree of arching or flatness of the back, the rotation of the wrists, and the turning in or out of the legs.

Author’s Reply: As touched upon earlier, one cannot tense all muscles in the body equally to the same degree. The greater the skill, the less individual tension and hence, overload. Many exercise protocols (like Superslow™ or Prescribed Exercise™) provide elimination of sloppy, haphazard movements. This is another marketing ploy of the Pilates group. Some females are drawn to this training method due to the “graceful” and “ballet-like” movements, often from a childhood ambition to become a dancer.

“All science is experiential; but all experience must be related back to and derives its validity from the conditions and context of consciousness in which it arises, i.e., the totality of our nature.”

Wilhelm Dilthey

Precision

Every movement in the Pilates method has a purpose. Every instruction is vitally important to the success of the whole. To leave out any detail is to forsake the intrinsic value of the exercise. The focus is on doing one precise and perfect movement, rather than many halfhearted ones. Eventually this precision becomes second nature, and carries over into everyday life as grace and economy of movement.

"It is a sign of a dull nature to occupy oneself deeply in matters that concern the body; for instance, to be over much occupied about exercise, about eating and drinking, about easing oneself, about sexual intercourse."

David Bailey

Author's Reply: All exercise should have a purpose, not just Pilates. Exercise has to have intent⁷ in order to be classified as such. "One precise movement" is performed when a trainee has mastered the skill, then of course this is possible. "Intrinsic value" is not explained. What value does Pilates have beyond training people who ballet dance? A modest effect at best, as it is a low tension, skill-based training method. What is a half-hearted effort? Is Pilates as physically demanding on the body as training with weights? From my experience and information available, it is not, thus suggesting Pilates is more 'half-hearted' than other methods. As mentioned, skills are task specific; therefore, the carryover of Pilates activities to activities of daily living is minimal at best. Again "grace" is mentioned, thus giving the impression that ladies will be more "graceful" and "ladylike."

Fluidity

Pilates' exercises are performed fluidly. There are no static, isolated movements because our bodies do not naturally function that way. Dynamic energy replaces the quick, jerky movements of other exercise regimes. Grace of motion is emphasized over speed; ultimately the movements should feel as fluid as a long stride or a waltz. Uniformly developed muscles are the key to good posture, suppleness, and natural grace.

"The very exercise of leadership fosters capacity for it."

Cyril Falls

Author's Reply: Bodybuilders have some of the most uniformly developed muscles, and so that implies they have excellent posture, suppleness and "natural grace" (Pilates' words, not mine). In that regard, it is self-contradictory. "Our bodies do not naturally function that way." Our bodies do not function naturally on a Pilates mat either. They do not require abdominals that are trained at one point in the range-of-motion; rather, optimization requires full-range strength training. "Grace of motion is emphasized over speed; ultimately the movements should feel as fluid as a long stride or a waltz." The nature of exercise should be to increase function in a targeted muscle, whether it be a skeletal muscle or the heart. It should be based on muscle function and joint motion, not dance moves or "grace." Lifting an object in daily activities is not graceful; it is functional. Building strength by targeting specific muscles (and their nature/action) is what gives the provision of more function. Even Dr. Mell Siff, most of whose work I do not support, states in his article Pilates Naked: "If you are willing to include a few methods from the world of resistance training (Weightlifting, Powerlifting and Bodybuilding) and martial arts, then your system will go far beyond what Pilates can ever offer."

⁷ Exercise as defined by Brian D. Johnston is "*Vigorous muscular activity, with the intent to cause inroads(loss) in functional ability, in order to stimulate a physiological adaptive response, to increase, maintain, or slow the regression of, said functional ability.*"

Final Comments:

One could ask the question: is it better to have an individual do some exercise rather than none at all? Yes, if it helps an individual to lead an active life and improves health. Is it all bad? Certainly not. Pilates unlikely is to damage anyone directly, or very little if a mishap does occur, which is a plus. It also does have some new techniques, which are somewhat dynamic and productive regarding 'core' activity. However, this is not the 'true' Pilates, that which is being discussed in this paper. Rather, it is a 'watered down' version we see in the fitness industry; a version now endorsed by many instructors in Europe and the USA that involves moves and 'proposed effects' that contradict or support poorly effective exercise methodology.

Pilates also may be able to provide maintenance of trunk strength in the medium term – strength that is built to a greater extent by direct, targeted exercise. Because of how Pilates is promoted, it may prevent people from striving towards more serious strength training methods; and for many with back problems, a single session on the Med-X lumbar spine machine will do far more to alleviate pain than months of Pilates. That is a tragedy, as marketing has taken over from proper exercise application and, therefore, is damaging peoples' health.

Author's Profile: Robert Morrison is a certified Fitness Clinician with the I.A.R.T. He has been published in Synergy 2006 and operates a personal training business, *RM Health & Fitness*.

Robert believes in finding the correct amount of exercise for every individual, and is an avid researcher of physiology. He also is a firm believer in safe exercise, and is opposed vigorously to the systems of Ballistic Barbell and Kettlebell training, Swiss ball training and other functional modalities, all of which serve to bastardize the science of safe and effective exercise. Robert can be contacted by emailing info@rmhaf.ie or by telephone at (00353) 857275774.

"Well, thank you. I do exercise in fact I am an exercise freak. Can't do without my regular work out. I'm not letting you in on any more of my secrets!"

Natasha Henstridge