

# Exercising in the Space of Possibilities

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Exercise is a different strokes for different folks kind of thing.

Here is a view from complexity science: There are two quantities that trade off against each other, complexity and scale. We can do things that are large scale and things that are more complex. Exercise is commonly divided into endurance, strength, balance and flexibility. All of these can be about scale. Walking for endurance and lifting weights for strength are both about scale. Scale shows up in the repetition of steps in walking or having every one of the fibers of your muscle contracting at once to lift a weight. This is different from walking where different combinations of fibers contract in each step so you can take many steps.

Complexity is different, it is about the variety of things you do. How many different kinds of motion and patterns of motion that you do as you exercise.

What are the benefits of complexity? Ability to do many different things. If you study one thing, and you are tested on that one thing, you learn to be good at it. If you do a variety of things and something new happens—a new challenge or a different opportunity—you are more likely to perform well. Exercise is an artificial world where we decide what we do. We practice and test ourselves on the same tasks: how far we can walk, how much weight we can lift, how many repetitions we can do. In the real world we might have to do (or have the opportunity to do) many different things. Practicing a variety of things pays off in better responding to anything that comes up. High complexity exercises expand the space of possibilities of what we can do and the confidence that we can do them well.

My good friend and colleague Nassim Nicholas Taleb has been advocating extreme exercise, particularly deadlifting for strength training [1]. He argues one extreme effort is more effective for muscle strengthening than many small ones. His advocacy has been debated on the basis of risks for injury and other arguments [2, 3]. In support, Nassim points to the training of airplane pilots in storms, difficult landings and intricate situations [4]. The advantage of training for extreme conditions is apparent because, even though they are rare, they have large consequences. However, the pilot practice is different in being high complexity not large scale—there are many different possibilities of what might happen.

Both repetition and single full strength pushes have

very limited variety. Elliptical and weight training have more limited variety than jogging and free weights. Still, the same thing over and over, as in elliptical training, is large scale. A single pull, as in deadlifting, is also large scale. All of the fibers of a muscle contracting at exactly the same time to achieve the force that is needed, is large scale. Either method does not prepare you for other types of exertion, a vulnerability that can lead to injury in real world conditions.

Among my favorite forms of exercise are downhill skiing and wind surfing. The mountain slope has a lot of variation in it, especially with moguls or among the trees, where skiing safely requires carefully exercising control. Many different variations happen in motion as you go down the mountain, and from run to run. Not only are these activities high complexity, they also have better views. Recently I am doing more dancing, another high variety activity / exercise. In partner dancing, responding to another person increases the complexity.

Every type of exercise has variants that are more and less complex. Walking on a track and on a beach are different. Dances with standard patterns are less varied, in principle, than those that are free form. Still, free form dancing can become simpler depending on the person who is doing it, because variation is not required. Different strategies will work for different people. Simple exercise may be a relief from the high complexity of our world. Still, it is good to remember that complexity can have benefits.

Ralph Waldo Emerson expressed an appreciation of complexity when he said: “A foolish consistency is the hobgoblin of little minds, adored by little statesmen and philosophers and divines. With consistency a great soul has simply nothing to do.”

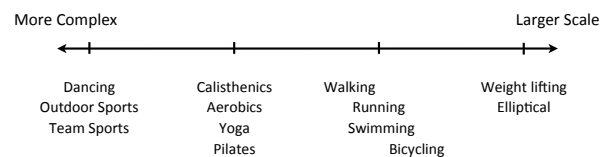


FIG. 1: Different types of exercise tradeoff scale and complexity. A very rough indication is shown of larger scale and higher complexity.

[1] NN Taleb, *Antifragile: Things that gain from disorder* (Random House, 2012), p. 47.

[2] What Taleb Got Wrong in *Antifragile* <https://tinyurl.com/y8dm92wy>,

[3] Why is Nassim Taleb obsessed with deadlifts? <https://tinyurl.com/ybdoww43>.

[4] NN Taleb, *Strength Training is Learning from Tail Events*, Medium (Nov 6, 2016) <https://tinyurl.com/y9tttphj>