



Path of least resistance

The principal of the path of least resistance or least effort has applications to multiple fields and is particularly helpful in management of repetitive use injuries. The path of least resistance describes a physical or metaphorical pathway that describes the least resistance to motion or action. It is closely related to principle of least effort. This is a broad theory that animal or machines will naturally follow the path of least effort. This concept has been applied to a wide range of fields, such as, physiology, hydrodynamics, business management, psychology, and library science or information retrieval.

Advantages of following the path of least resistance

Following the path of least resistance has its advantages; it takes much less effort to accomplish things. Animals and humans have an amazing innate ability to deal with weakness or inferiority by following the path of least resistance and compensating for the weakness or inferiority. The human body will always good to the best compensation.

A common observation is runners often self select a running style which involves striking the ground with the heel first when running and when striking the ground the knee is often in a fully extended position. My belief is this is a frequent event because it requires the least amount of effort, there is less energy expended in comparison to striking the ground with the whole foot and when striking the ground the knee is slightly flexed and this requires muscular activity. Experiments have shown when a runner is forced to run with a stride length shorter or longer than his/her preferred stride length it requires greater amounts of energy expenditure. The preferred stride length is often the most efficient.

Disadvantages of following the path of least resistance

Moving in a manner which follows the path of least resistance or moving in a manner of least effort is not always ideal.

Using the example above that there may be an advantage to striking the ground with heel first and with the in a fully extended position can be more energy efficient, there is also a growing body of evidence that running with this particular form or technique increases the risk of injury of stress fracture, knee pain, and heel pain.

If a muscle tendon unit has relatively less resistance to force/stress that it is subjected to the muscle tendon unit could be described as being more compliant, more flexible, or weak. If there is diminished resistance to force the muscle tendon unit may be described as the weak link in the chain and more likely to be injured. The more flexible muscle becomes the path of least resistance, and once the path of least resistance is established it is easy to keep moving along that path even though it may not be the optimal or most precise path. Often the most flexible /tendon/muscle is the painful muscle. When an Achilles tendon is strained it can be longer and more compliant than normal, and therefore should not be subjected to additional stretching exercises. Perhaps a better approach would be to select an intervention which would stiffen the Achilles tendon so that it could resist the path of least resistance.

Frequently when getting out of a low chair the preferred way of moving is allowing the knee joints to deviate towards the mid-line of the body and the knees will actually touch each other. This is following the path of least effort, as it requires less muscular effort, the thigh bones end up bracing and leaning against each other, instead of using the buttock muscles to keep the knees from kissing each other. If the knee aligns in this manner it places abnormal stress across the knee joint leading to pain.

Following the path of least resistance or least effort can result in achieving minimally acceptable results. Running a race in a manner that expends the least amount of effort allows you to finish the race, but you will not win the race or set personal record time for the race distance.

Because it is a law of nature, does not mean humans are pre-determined to follow that law. Going against the current is hard work, but it can have significant benefits. There are times it is important to recognize the path of least resistance and to not take that path.

“Two roads diverged in a wood, and I took the one less traveled by, and that has made all the difference”
Robert Frost