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The Lethality-Fitness Paradox—Part 2: Understanding the Lethality-Fitness Paradox

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Abstract

Eliciting lethality and performance should be the goal of the military strength and conditioning (S&C) professional. Critical to facilitating lethality is understanding lethality and the lethality-fitness paradox. The lethality-fitness paradox states that "lethality can be influenced negatively, positively, or minimally by fitness, which depends on the context at a fleeting moment." This article is the second in a three-part series that describes lethality, the paradox between lethality and fitness, and the role of the military S&C professional.

Introduction

This work is the second article in a three-part series regarding lethality, the lethality-fitness paradox, and the role of the military strength and conditioning (S&C) professional in facilitating lethality. The previous article described what lethality is and what lethality is not; coupled with a fictional case study to assist the reader in understanding lethality.[1] The purpose of this article is to describe the lethality-fitness paradox in detail, with the third article describing the optimal interdependent and integrated (I&I) role of the military S&C professional in promoting lethality. The purpose of this series is to provide an understanding of how military S&C professionals can elicit lethality and not just fitness for our Service members (SMs).

Lethality Summarized

As defined, "*Lethality* is the transient and relative state to kill or destroy the enemy and is dependent on efficiency, effectiveness, survivability, abilities, capacity, and mindset, while being impacted by chance."[2] Although sometimes wrongly classified as such, lethality should not be equated to equipment, technology, or initial training.[3] Rather, lethality is the interplay of being trained, educated, equipped, tested, efficient, effective, survivable, and able (i.e., permission) to kill and destroy the enemy, with the needed capacity (i.e., critical mass).[4] Figure 1, taken from the previous article, provides a flow chart to determine if a person or entity is lethal in a specific scenario, while being subject to chance.[5]

The Lethality-Fitness Paradox

Critical to understanding how a military S&C professional can elicit lethality is the understanding of the lethality-fitness paradox. The lethality-fitness paradox is that lethality can be influenced negatively, positively, or minimally by fitness, which depends on the context at a fleeting moment.[6] Of note, how one defines and assesses *fitness* does matter.

The author recommends to the military S&C professional that they, with the SMs, establish their agreed upon definition of *fitness*. Based off the definition, they can then collectively determine how to assess fitness. Notably, one must define fitness prior to determining how to measure it. While the SMs and S&C professionals cannot choose how fitness is defined or measured by the Service(s) (i.e., Physical Fitness Test, Combat Fitness Test, Army Fitness Test),

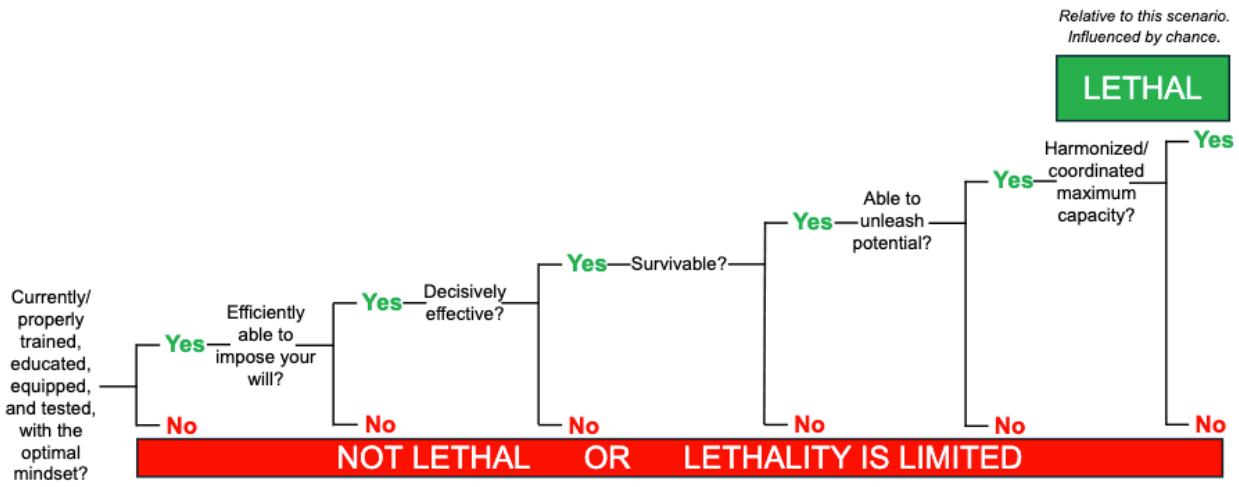


Figure 1: Flow Chart for "Lethality" to "Not Lethal" or "Lethality Is Limited."

they can control how their specific unit defines and measures fitness, which ideally will positively impact the lethality-fitness paradox. A proposed definition of fitness for SMs in ground combat arms is "get to the objective, impose your will on the objective, and then be ready for the next objective."[7] This definition of fitness can then be emphasized and measured, as well as acknowledged or corrected for optimal or suboptimal efforts and actions, respectively.

"Lethality is the transient and relative state to kill or destroy the enemy and is dependent on efficiency, effectiveness, survivability, abilities, capacity, and mindset, while being impacted by chance."

Fact—Fitness Does Not Equal Lethality

The fact of the matter is that fitness (however you choose to assess SMs' fitness levels) does not equal lethality. As S&C professionals, we tend to believe that if we increase one's fitness levels, we have (perhaps even proportionally) increased their battlefield performance or lethality. However, this is not the case. Trachik et al. (2025) write that "being lethal requires numerous subsets of complex skills, aptitudes, talents, and proclivities . . ."[8] SMs, especially those in ground combat arms, have time compressed and competing schedules. Often, when those in deploying ground combat arms professions increase their investment into fitness, they are intentionally or unintentionally divesting of other tasks, which could include tactical training, field exercises, range time (marksmanship), or other fitness metrics. For example, the emphasis on increasing an SM's fitness levels via assessments in the weight room (e.g., back squat, pull-ups, military press) could impair their fitness capacities in other areas, such as moving under load (i.e., movement with personal protective equipment, assault packs, rucks) if done incorrectly.

Therefore, simply increasing fitness does not necessarily equate to an increase in lethality, and must be paired with additional assessments that influence lethality (i.e., marksmanship, decision making, material readiness). Of note, Trachick et al. (2025) found that United States soldiers' Army Combat Fitness Test (ACFT) scores, (which consists of three repetition maximum hex bar deadlift; standing power throw (throwing a ten-pound [lb] medicine ball as far as possible; two minutes of hand-release push-ups; sprint/drag/carry [fifty-meter shuttles carrying two, forty-lb kettlebells and pushing a ninety-lb sled]; plank; and a two-mile run) had no correlation to the soldiers' perceived lethality.[9]

Fitness ≠ Lethality

Meaning that the SMs with high ACFT scores did not view themselves as more lethal when compared to those of lower ACFT scores. The following eight points will help illustrate the lethality-fitness paradox, and how fitness does not equal lethality.

Point 1—A Decrease in Fitness May Decrease Lethality, But Not Necessarily

If we decrease our fitness levels (however one chooses to assess fitness), we may decrease our lethality, but not necessarily. Again, we must consider how we measure fitness. For example, if we are assessing fitness via the maximum number of pushups one can do in a two-minute period, and this SM goes to a difficult tactical school requiring a significant amount of time in the field, they will likely complete a lower number of pushups following the conclusion of the school. However, the SM has probably increased their lethality due to an increase in tactical- specific fitness, cognition, skills, abilities, and leadership.

Conversely, if we are measuring fitness by the ability to conduct load carriage (movement with personal protective equipment and/or a load bearing apparatus, such as an assault pack or ruck), and an SM drastically decreases in their ability to conduct load carriage, then they may have decreased their lethality. Again, further questions and assessments must be used in concurrence with measuring one's capability of moving under load to determine if they have in fact decreased their lethality. Perhaps this SM attended an academic course to be able to coordinate Joint fires and is more effective at calling in kinetic strikes (close air support, indirect fire, naval gun fire) from the Joint Force. Therefore, myopically assessing fitness is limiting the military S&C professional in facilitating lethality for our SMs.

↓ Fitness *May* ↓ Lethality

Or

↓ Fitness *May* ↑ Lethality

Point 2—An Increase in Fitness May Increase Lethality, But Not Necessarily

If we increase our fitness, we may increase our lethality, but not necessarily. If we were to improve an SM's timed distance running, movement under load, sprinting velocity, strength, power, flexibility, balance, agility, and body composition, then we *probably* would have increased their lethality. However, if the SM had to divest hand-to-hand combative training, marksmanship, combat lifesaving training, and field exercises in order to increase their fitness, then we would probably have decreased their lethality. Again, fitness in isolation cannot determine lethality, thus S&C professionals should be more involved in the overall preparation for combat rather than for fitness alone, as they understand training principles, statistics, and program design.

↑ Fitness *May* ↑ Lethality

Or

↑ Fitness *May* ↓ Lethality

Point 3—Greater Adherence to a Plan May See a Decrease in Lethality

An SM's training calendar is compressed, competing, and changing, especially for those in ground combat arms who are preparing for a deployment. Thus, it is incredibly difficult for an SM to adhere to a periodization plan, especially periodized programs that are rigid. While laziness and apathy should never justify not adhering to an exercise plan, rest, recovery, injuries, and non-fitness training (i.e., marksmanship, tactical combat casualty care) are valid reasons for altering a plan. The SMs who can adhere to a strict periodized plan are likely not in a unit preparing for deployment. Thus, it is common to see that greater adherence to an exercise

plan may lead to a decrease in lethality, as there are likely minimal competing requirements (field training, tactical schools, deployed for training events), with these SMs likely having an administrative, teaching, or staff role in the unit.

One tactic that military S&C professionals can apply when working with SMs is to apply *exercise description*, not exercise prescription. Every S&C professional is taught about exercise prescription, simply summarized as the FITT [frequency, intensity, type, and time] principle. However, if prescribing exercise to SMs preparing for deployment (i.e., exercise order, intensity, volume, rest periods, microcycles, mesocycles, macrocycle[s]), the SM will likely not be able to adhere to the program, especially a highly prescriptive program. Thus, tactical S&C professionals should use exercise description.

The author proposes the definition of exercise description as using the language of the population to be trained to teach the philosophies and principles of exercise. For example, regarding the military, the language that can be applied is techniques, procedures, tactics, operations, and strategy when teaching SMs on exercise techniques, exercise selection and order, microcycles, mesocycles, and macrocycles, respectively. Exercise description includes, but is not limited to, educating the SM on periodization, recovery, warming up, and exercise techniques. Centric to exercise description is teaching the purpose (the why) for the exercise program so that the SMs can apply these concepts in a fluid training or deployed environment.

↑ Adherence to a Plan
May ↓ Lethality

↑ Gym Attendance
Will Likely ↓ Lethality

Point 4—Greater Adherence to Gym Attendance Will Likely See a Decrease in Lethality

An SM who is in the gym five days a week, four weeks a month, twelve months a year has great gym adherence. However, this SM is probably not lethal in many scenarios, as gym consistency is nearly impossible with field training, tactical schools, deployed for training, or deployments. A potential scenario where an SM can have high gym attendance while still being lethal is in a combat instructor role. However, one must consider what role they play as an instructor (administrative compared to tactical advisor) and whether they are conducting sustainment training themselves to maintain lethality. Being a tactical instructor does not guarantee that one is lethal or that they are increasing their lethality, as research has shown that many people achieve an acceptable level of performance and stop improving in their profession.[10]

Point 5—Current Fitness Assessments May Reward What We Do Not Desire

A fact that we must recognize is that current military fitness assessment *may* reward what we do not desire. Let us analyze aerobic capacity via running as an example. We have known since at least the early 1980s that running economy ("the oxygen cost of running at a specific speed")[11] is a very strong predictor of distance running performance.[12] In fact, running economy can account for an approximate 66 percent of variation in 10-kilometer (6.2 mile) races for well-trained runners.[13] Running economy is impacted by two primary factors, specifically extrinsic (e.g., shoes, running surfaces, environment) and intrinsic (e.g., genetics, kinetic, anthropometric) factors.[14] Accordingly, those with greater leg musculature, as well as total body musculature, will have a lower running economy (i.e., workload efficiency) than individuals who possess less leg and total body musculature. We know that leg strength is associated with leg muscle size, and we know that leg strength and lean body mass are associated with increased performance in loaded movement.[15] Based on these

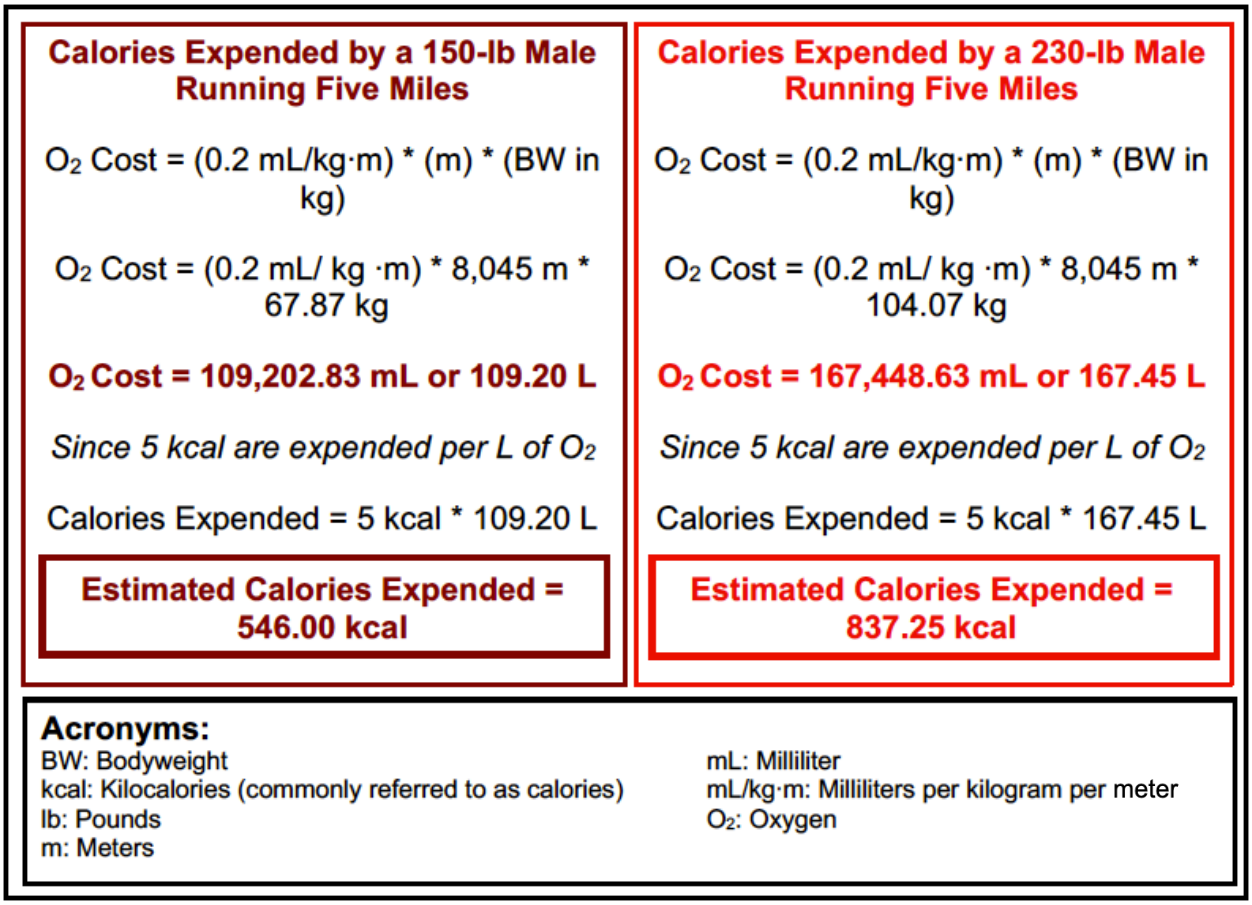


Figure 2: Mathematical Equations to Determine Calories Expended by a 150-Pound Male and a 230-Pound Male Running Five Miles.

associations, if we were to emphasize aerobic capacity via running as a key determinant of fitness, we *may* be rewarding those who are smaller and possess less musculature and are therefore more prone to overuse injuries associated with load carriage.

Additionally, the work, and accordingly the energy expenditure, of running will be greater for those who have more muscle and larger frames. For example, a 150-lb male with 10 percent body fat will expend approximately 546 calories running five miles (a common running assessment in the United States Special Operations Command to determine fitness), while a 230-lb male with 10 percent body fat will expend an estimated 837 calories. Despite the difference in work (shown via calories used in running five miles), these two individuals are graded to the same standard (calculations based off the equations provided by the American College of Sports Medicine).[16]

The same can be said for pull-ups, an exercise which biomechanically favors those who have less body weight and shorter arms. Thus, a five-foot-six-inch 150-lb male with 10 percent body fat and twenty-four-inch length arms (measured from the acromion process to the carpals) has a considerable advantage to a six-foot-four-inch 230-lb male with 10 percent body fat and twenty-seven-inch length arms when assessing pull-ups. Provided the 150-lb male's grip was slightly wider than shoulder width apart, he would be required to displace his body approximately 19.5 inches per repetition (chin to bar), requiring 332.90 N•m of positive work per repetition and 442.76 N•m of total work per repetition. If the 230-lb male's grip was slightly wider than shoulder width, then

Measurement	150-Pound Male	230-Pound Male	Percent Deficit
Positive Work Per Pull-Up	332.90 N·m	632.98 N·m	47.41%
Total Work Per Pull-Up	442.76 N·m	841.86 N·m	47.41%
Total Work Over 23 Pull-Ups	10,183.48 N·m	19,362.78 N·m	47.41%

Table 1: By the Numbers—The Difference in Work for 150- and 230-Pound Males Performing Pull-Ups.

he would move roughly 24.5 inches per pull-up, therefore conducting 632.98 N•m of positive work per pull-up and 841.86 N•m of total work per repetition. Within the Marine Corps, males ages twenty-one to thirty-five years of age are required to perform twenty-three pull-ups to receive a full score on their Physical Fitness Test.[17] Thus, the 150-lb male performs 10,183.48 N•m of work over twenty-three pull-ups, compared to the 230-lb male who performs 19,362.78 N•m of work during twenty-three pull-ups. Table 1 shows the differences in work by the two males, with Figure 2 showing the calculations. Of note, for the 150-lb male to perform the same amount of work as a 230-lb man performing twenty-three pull-ups, the 150-lb male would have to perform 43.73 repetitions. (Calculations based off the equations provided by William Beam and Gene Adams.)[18]

Furthermore, third-class levers, in which "the muscle force and resistive force act on the same side of the fulcrum,"[19] are the most common type of lever in the human body, and third-class levers are at a mechanical disadvantage.[20] Meaning, for a third-class lever, "a force greater than the resistance, regardless of the point of the force of application, is required due to the resistance arm always being longer."[21] As most muscles rotate limbs while being at a mechanical disadvantage, we see the internal muscle force being "much greater than the forces exerted by the body on external objects."[22]

The simplest example of this can be seen via elbow flexion during the pull-up, regardless of whether an SM were to apply pronated or supinated grips. When the palms are supinated, the biceps brachii is in its optimal location to generate force, whereas when the palms are pronated, the brachialis is the primary elbow flexor.[23] Both the biceps brachii and brachialis operate via a third-class lever.[24] Thus, during the pull-up, not only is the larger SM having to displace his body further with each repetition (requiring more total work), but the larger SM must also do so at a greater mechanical disadvantage regardless of the grip used in the pull-up.

The 230-lb male would be able to carry the 150-lb male out of a kill zone easier than the reverse scenario. Furthermore, the 230-lb male will more than likely be able to carry heavier weight than the 150-lb male, as well as be more resilient to injuries associated with load carriage. Charles Dean and his team determined that the average weight carried by a United States Army infantry platoon in Afghanistan was 63.9-lb, 101.4-lb, and 132.3-lb for their fighting load, approach march load, and emergency approach march load, respectively.[25] Lean body mass (i.e., musculature) is "crucial for predicting successful load carriage performance," as an increase in lean body mass decreases the relative demands of load carriage."[26]

Dick Couch, who has written on the training pipelines of the US Navy SEALs,[27,28] Army Special Forces,[29] Army Rangers,[30] and Marine Raiders,[31] states that durability is the most important physical aspect of modern-day operators.[32] However, when using common fitness assessments (i.e., pull-ups, long distance running, planks), we are favoring what we do not want (i.e., smaller frames that are likely less durable). Of note, Vanderburgh and Flanagan found when studying fifty-nine male Service Academy Cadets, having the cadets run two miles with a loaded pack (30 kilograms; 66.3 lb) negated the bias against heavier runners often seen in traditional fitness assessments.[33] Guy Leahy suggests that favoring

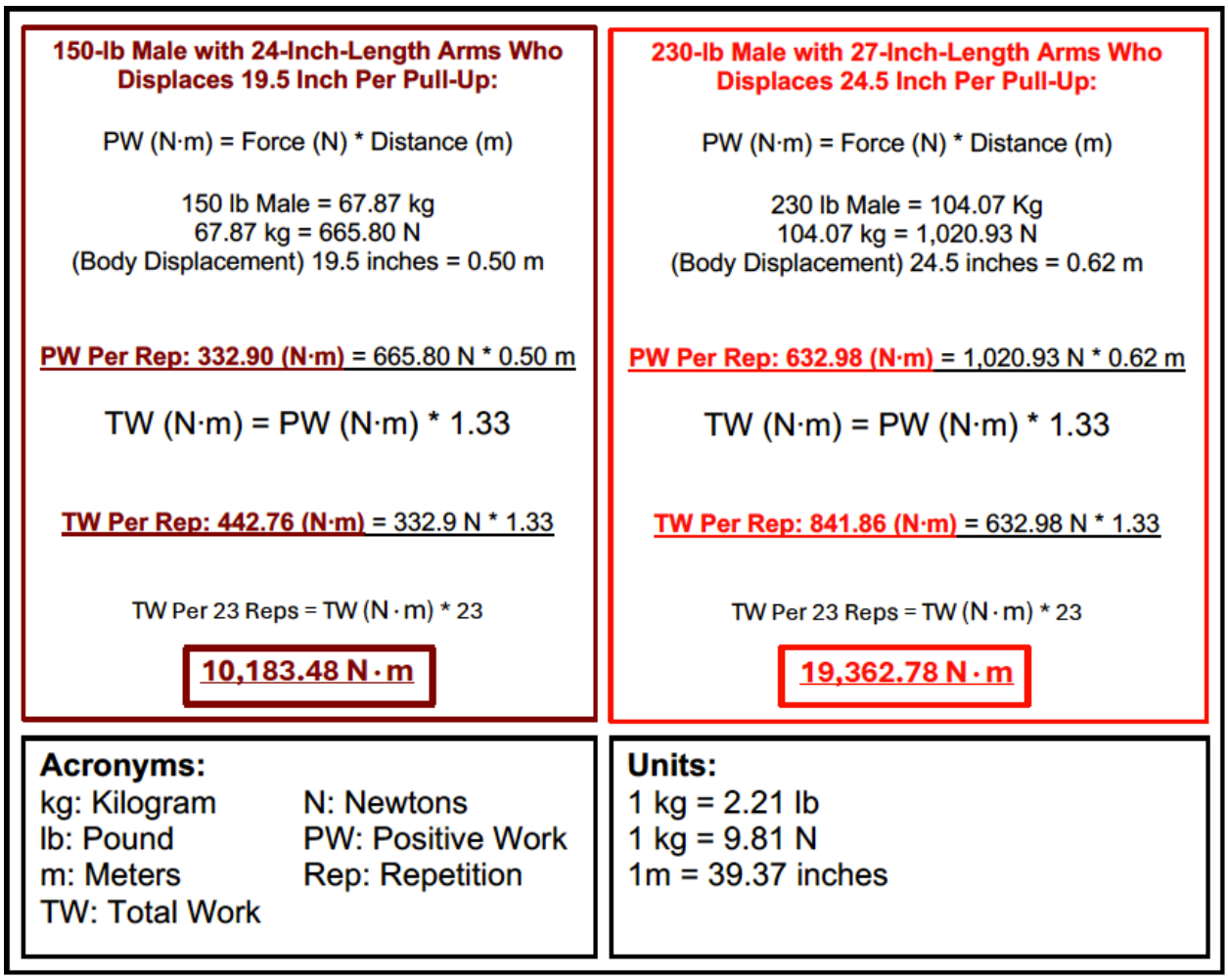


Figure 3: Mathematical Equations to Determine During the Pull-Up.

smaller individuals who score better on fitness tests can lead to scenarios on deployment where they are not big or strong enough to accomplish mission tasks; increasing the risk to the mission, SMs, and unit.[34]

Point 6—Fitness Hobbies and Competitions Can Decrease Lethality

The lethality-fitness paradox states that lethality can negatively be influenced by an increase in fitness. A prime example can be when SMs prioritize fitness hobbies over lethality. Many SMs engage in IRON MAN competitions, marathons, and like activities to increase their fitness. While these endeavors can be beneficial to the SM and to the unit through increased fitness (e.g., improved strength, power, endurance, body composition), the moment that a hobby becomes more important than one's duty and preparation for combat, we will see a decrease in lethality.

In his book *Can't Hurt Me: Master Your Mind and Defy the Odds*, David Goggins writes about his impressive fitness competitions that he conducted while an active-duty Navy SEAL. When preparing for Badwater (an ultra-marathon event), he said he had two full-time jobs, as he was a Navy SEAL and an endurance athlete.[35] However, he was not deploying during this period (circa 2007–2011);[36] therefore, he was not conducting training that increased his lethality (e.g., close quarter combat, marksmanship, battle drills). Goggins writes that in 2007, he was running an ultra-marathon nearly every weekend,

but the reader should note that during this period Goggins was assigned to recruiting duty.[37] According to his book, a typical day for him in training was 4:00 a.m. to 5:15 a.m. running, followed by a twenty-five-mile bike ride to the office. He would work from 7:30 a.m. to noon at the office; then, during lunch, he would either workout at a gym or do a four-to-six-mile beach run. Finally, he would ride his bike twenty-five miles home.[38]

Goggins states that his workout regime did not interfere with his work. However, he was not preparing for combat during this period—a point crucial to the lethality-fitness paradox discussion. An SM this devoted to fitness cannot be equally dedicated to increasing the skills, cognition, and leadership needed to promote lethality. Comprehensive dedication to either focus (fitness or lethality) represents a different trajectory yielding a specific outcome. Therefore, both military SMs and S&C professionals should be dedicated to lethality, not fitness in isolation.

"The lethality-fitness paradox is that lethality can be influenced negatively, positively, or minimally by fitness, which depends on the context at a fleeting moment."

Fitness Hobbies
Can ↓ Lethality

Point 7—How You Define Fitness Matters

How you define fitness should determine how you train and measure fitness. As discussed in Point 5, current fitness assessments may reward what we do not desire. While a military S&C professional cannot change the Services' fitness tests, their proposed duty is to facilitate lethality of their SMs. Thus, S&C professionals should ask their SMs, "What does fitness mean to us?"[39]

As stated, a proposed definition of fitness for those SMs in ground combat arms is to "get to the objective, impose your will on the objective, and then be ready for the next objective."[40] Depending on how one measures getting to the objective, imposing one's will on the objective, and being ready for the next objective can determine how you train fitness. For military S&C professionals, fitness training should mimic and include lethality traits.

Point 8—A True Physiological Peak in Fitness Will Likely Decrease Lethality

Military training, especially in combat arms, is demanding. We know that there are several factors that promote overtraining syndrome, such as stress (emotional, psychological, occupational, environmental, physical), illness, insufficient sleep, training program design flaws (excessive volume, unaccustomed intensity, extreme duration, training multiple times per day, monotonous training), inadequate nutrition, and long training cycles.[41] Notably, these factors are intentionally and unintentionally integrated into an SM's workup to mimic the demands of combat.

While we want to try to apply the principles of periodization as much as possible into an SMs' training program,[42] a true physiological peak may decrease lethality. To facilitate a physiological peak, a taper is applied, which is the deliberate reduction in training stimulus to facilitate restoration and recovery. As stated by Dr. Gregory Haff, "The ability to truly peak an athlete is a complex process that is affected by a multitude of factors, including the training volume, frequency and intensity."[43] Haff provides several recommendations on how to taper to elicit a physiological peak to include: (1) designing an individual program, (2) reduce training volume by 41 to 60 percent for normal scenarios (61 to 90 percent for high amounts of fatigue), (3) apply moderate to high training intensities to avoid detraining; (4) maintain equal to or greater than 80 percent of pre-taper training frequency; (5) use a taper of one to four weeks, with

eight to fourteen days being the most commonly applied taper.[44]

There are several reasons why eliciting a true physiological peak may decrease lethality. First, as stated, fitness does not equal lethality. Second, if we must divest of lethality preparation to stimulate a physiological peak, we have decreased lethality (Points 1–4 and 6). Third, a physiological peak should not be the standard, rather a peak in performance and lethality (i.e., performance realization), which requires input greater than fitness in isolation should be the standard. Performance realization has been defined as, the "heightened holistic, integrated, and harmonized readiness and preparedness of the influencers of performance."[45]

Thus, for performance realization to occur, contributors other than fitness in isolation must be periodized into a preparation program. A way that a military S&C can accomplish this is through I&I periodization. I&I periodization has been defined as, "the logical, integrative, sequential manipulation of all performance influencers—not just those that contribute to physical readiness—to optimize adaptations for predetermined, fleeting moments."[46]

Conclusion

The Lethality-Fitness Paradox states that "lethality can be influenced negatively, positively, or minimally by fitness, which depends on the context at a fleeting moment."[47] Although fitness is not equal to lethality, it remains a component of it; therefore, SMs should still maintain or increase high levels of fitness (however one chooses to assess fitness levels). Being physically fit is a requirement for all SMs, and notably being physically fit will impact other influencers of performance (e.g., cognition, skills, abilities, leadership, will, and culture). However, lethality is greater than fitness in isolation, and as the military S&C professional's proposed role is to facilitate lethality, the military S&C professional must prepare the SM to be more than physically fit. The third and final part of this series will be to describe the optimal I&I role of the military S&C professional in promoting lethality for the SM.

Biography

Jeremy Carter (featured right) is the Founder, Owner, and President of True Performance Realization (TPR), and serves as the Editor-in-Chief for the *True Performance Realization Applied Journal* (*TPRAJ*). With over eighteen years of experience in human performance, Jeremy has earned numerous certifications, including the National Strength and Conditioning Association's (NSCA's) Certified Strength and Conditioning Specialist with Distinction and the American College of Sports Medicine's Exercise Physiologist. He is a current reviewer for the NSCA's *Strength and Conditioning Journal* (*SCJ*), a founding member and editor for the *Journal of Sport and Human Performance*, and a recipient of the NSCA's *SCJ*'s 2023 Editorial Excellence Award.



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