

HIT and HVT Misunderstandings

Brian D. Johnston

This is an updated version of Brian Johnston's chapter in the book *Maximize Your Strength*.

Every existent has but one truth, an identity that cannot be contradicted; and it can be neither ignored by man's conceptual faculty, nor escaped if man is to exist and prosper within reality. Identity is an irreducible primary, an axiomatic concept, that is a fundamental of epistemology (the study, nature and acquisition of knowledge) and metaphysics (the study of existence). As a rational animal, man has a unique identity, as does an apple, a tree, celestial bodies, and everything within the universe.

Anaerobic exercise (strength training and bodybuilding), likewise, is a specific concept within reality, and it has a specific identity and, therefore, it has an exact meaning or definition. If it did not, the term anaerobic exercise could not be integrated properly with other abstractions or concepts and it could not exist per se. The exorbitant perceptions of what constitutes anaerobic exercise is so varied among the so-called experts that it has become a nebulous approximation to the extent that the average individual is perplexed in securing its proper meaning. Accordingly, anaerobic exercise must be grounded on non-contradictory principles.

Anaerobic exercise is typically characterized as being high in intensity/effort, relative to aerobic or endurance-based exercise, and it is brief in duration, with sets lasting under two minutes tension time. This does not imply that an activity short in duration must utilize the anaerobic system, or that the activity must be intense. Rather, and in terms of strength training and bodybuilding, to derive an optimum benefit, anaerobic exercise must be intense. If it is intense, the length of the workout will be brief; and the sets should be brief enough (less than two minutes) to avoid entering the aerobic energy system and to shift the focus from endurance and toward developing greater muscular force and muscle mass. Deviation from this direction challenges the nature of anaerobic exercise such that it no longer exists as it should – with more emphasis placed on endurance than strength or muscle – or the length of the workout becomes such which cannot be tolerated (for very long). Although the approach to strength training can vary in application, such as the number of repetitions, repetition velocity, time under load, it must do so within limited reason in order to hold true to its identifying methodology for optimum progress. In effect:

Any amount of exercise stress represents a negative factor, in that, to a degree, any exercise performed at all causes an inroad into the body's recovery ability. Therefore, exercise must be cautiously regulated to the extent that if an inroad into recovery ability is caused, then that much of the body's resources must be used to compensate for the exhaustive effects of the exercise, i.e., to overcome the inroad. This leaves that much less of the body's limited reserve of resources for the overcompensation of growth. Accordingly, exercise must be prescribed in an appropriate measure in accordance to each individual's needs, goals, abilities, and limitations for optimum progress.

In order to increase muscle strength and size, one's existing anaerobic, functional ability must be challenged, with an increase in weight and/or repetitions on a continual basis, or an alteration/variation within the program as to cause a "shock" to the system. Anaerobic stress physiology indicates that this is best accomplished, so long as overtraining is non-existent, by exerting each work set relatively hard, and up to a point of momentary muscular failure, regardless of the number of repetitions, e.g., 8 or 12. Effort of a modest degree will likely not challenge current functional ability, and such effort may only maintain current strength levels at best, unless a trainee is relatively new to the exercise experience. Attempting to increase the number of sets to make up for the lack of effort will enhance muscular endurance more than muscular strength and size.

There must be adequate recovery time between exercise sessions to allow replenishment of fuel resources, compensation (tissue remodeling), and eventually overcompensation in the form of new muscle growth or lifting proficiency. Although stress has a localized effect on muscles, stress also has a general effect on the entire body. Consequently, recovery time between sessions for unrelated body parts is just as important as recovery time between sessions for the same body parts. Training again, before the body has had sufficient time both to compensate and overcompensate, may hamper progress and result in generalized fatigue (overtraining).

The above may appear quite evident upon review, and it comes from a person (myself) who exercises very intensely most of the time and with low volume; low, at least, *relative to* fitness magazine hyperbole. Regardless, high-volume, orthodoxy collectivists are eager to refute that brief, intense methods of strength training do work, yet this idea contradicts itself when the collectivists indicate that there is more than one valid approach to strength training. Usually "other" ways are accepted, so long as the underlying philosophy of the other way does not contradict or challenge their position to any great extent. Those who promote sub-failure, high-volume exercise are adamant in their position since a reduction in quantity and an increase in quality exposes the frailty of the high-volume application, i.e., "why do 'that many sets' when you can get the same results with 'this few sets'"?). Moreover, when it is demanded that the volume 'experts' in fitness magazines state their theory of exercise, and the relationship of the theory's underlying principles, silence ensues — blank out!

In essence, the two principal genera in resistance training can be reduced to:

- 1) High-intensity — HIT; maximum effort on all work sets while very few sets per exercise and/or muscle are incorporated (exactly what "very few" means remains subjective among trainees) on an infrequent basis (*ibid.*). It's difficult to classify HIT any differently, since the *only* commonality among HIT enthusiasts is the belief that one should exercise very intensely.
- 2) High-volume — HVT; moderate effort for the most part, while multiple work sets (3-5 on average) per exercise/per body part/per workout, on a frequency of 1-2 times per week for each exercise and/or muscle are incorporated. This is reflective of most fitness magazine recommendations, although HVT would correctly refer to "doing more than is appropriate relative to an individual's tolerance to exercise strain, either over the short- or long-term". In other words, the volume is "high" rather than "appropriate" or "ideal").

Unfortunately, these lax abstractions and descriptions further accommodate the more explicit ideologies and perceptions of the fitness industry. For instance, some advocates of intense training avoid direct sets for smaller body parts to justify any crossover effect, e.g., biceps stimulation during lat pulldowns. Others include multiple sets per body part, of different exercises. Doing so may or may not be too voluminous, but which volume is relatively diminutive when contrasted to typical high-volume methodologies, e.g., 10+ sets per muscle on a regular basis.

The HVT Weider approach to bodybuilding recommends an ambiguous 3-5 sets of 3-5 exercises per muscle, whereas periodization fluctuates the intensity (the weight, in this case), volume and frequency from one cycle to another, depending on specific training goals, i.e., strength, power, mass, endurance. (The implementation of varying seasonal training is ludicrous, and this will be addressed later.) Although perception of what constitutes purposeful strength training application is a source of chaotic diversity, even among colleagues of similar methodologies, the argumentative and theoretical discrepancy between HIT and HVT remain obvious and most debated.

Unfortunately, both groups are wrong. Some people cannot or are unable to train to muscular failure and, as a result, they do require more sets (whatever the measure) to obtain a good or optimal response. Some people simply perform too much work, and they believe that any "champion" routine found in a magazine must work or that the program can eventually lead a naive individual to "super-muscle stardom".

The purpose of this article is to address:

- 1) The physiological effects of both HIT and HVT (high volume to the extent that there is a clear reflection of fitness magazine methodology, as per the classification above).
- 2) How HVT proponents perceive HIT, and the myths underlying their beliefs.¹
- 3) The basis for which HVT should be considered, and the myths underlying some of those beliefs.

Physiological Effects of HIT and HVT

HIT, i.e., great effort within an anaerobic environment, has distinct attributes via a cause and effect relationship. Increases in phosphogenic concentration and glycolytic substrates (both energy-yielding components of anaerobic exercise) and increases in anaerobic enzyme activity are most notable. Consequently, there is also a gradual abatement of aerobic-oxidative enzymes with long-term implementation of HIT-style of exercise. Moreover, and primarily because of the longer recovery intervals between workouts than is found with a HVT-style exercise, HIT has been linked to enhanced immunogenicity. These factors are reflective of the SAID principle, whereby the physiological mechanism maximizes and adapts to a particular stressor for survival, if there is sufficient time to do so.

Conversely, exercise that encompasses low to moderate intensity of effort or repetitive bouts of activity on a highly frequent basis (5-6 sessions per week), increases aerobic-oxidative enzymes and mitochondria proliferation to, likewise, adapt to a particular physiological environment — that of endurance.² This may not be true of all HVT routines, but the potential for such adaptation increases as the measure of volume and frequency increases while intensity decreases.

Moreover, although HVT exercise approaches do incorporate very intense effort interspersed throughout total workout volume, there is a disproportionate inclusion of lower-intensity, valueless effort. In effect, HVT becomes a psychologically dependent provocation of how much one can endure to prove merit as an "iron warrior", among other psychological strangleholds; hence, there is a focus on total work volume and frequency rather than quality and effort. As a result, there is also a proclivity for fast twitch fibers to atrophy because of overuse stimulation.

Physiologically, exercise that enhances strength and muscle is an unnatural event; it is one that force adaptation to a greater apex of functional capacity and ability for the purposes of survival. When subjected to stress, whether it is exercise, extreme cold, or emotional and psychological anxiety, specific events transpire, as discovered by the father of modern stress research, Hans Selye, include:

¹ I am not pro-HIT, in the sense that I believe all work sets must be trained to muscular failure, or that everyone need train that hard. Rather, intensity of effort must be high enough relative to the volume and frequency, and there should be a focus on effort rather than the performance an excess number of sets on a very frequent basis when the goal is to maximize strength and muscle tissue. Doing more than is necessary is superfluous and hampers progress. Obviously, the measure of these factors is highly subjective. However, the point is that many HVT proponents do not understand HIT philosophy, and they have drawn incorrect conclusions and arguments as a result.

² Pollock, Michael L., et al. *Muscle*. Rehabilitation of the Spine. Mosby-Year Book, Inc., 1993. p. 264.

- 1) An enlargement of the adrenal cortex.
- 2) Atrophy of the thymus, spleen, lymph nodes, and all other lymphatic structures of the body (including a large reduction in eosinophil cells [a type of white blood cell]).
- 3) Ulcers in the lining of the stomach.³

Therefore, although exercise for the biceps may have a localized effect on the myofibrillar architecture within the biceps, there is also a generalized (endocrinological and neurological) effect; performance of 15 sets for the biceps means performance of 15 sets for the body. This is empirically evident the day following a hard leg workout, whereby a trainee feels reluctant to exercise the back, chest, or some other muscle because of an overall feeling of general fatigue.

To compare the cumulative, depleting effect of two approaches, consider the following: 1 set per body part x 7 body parts x 52 occasions per year (i.e., once every 7 days) x 25 years = 9,100 bouts of stress. Conversely, 10 sets per body part x 7 body parts x 73 occasions per year (i.e., once every 5 days) x 25 years = 127,750 bouts of stress. This equals fourteen times the magnitude of stress as that incurred by the sample HIT approach. In all fairness, and if one were to avoid the mathematics above, the difference would not be fourteen times, since the physiological strain of maximum effort HIT work would close the gap. However, there is still a difference in regards to physiological wearing, including immune system problems and osteoarthritis as a trainee grows older. Moreover, there would have to be evidence that the HIT approach could produce a similar response in muscle and strength as the HVT approach to better compare the two measures above.

If, for the sake of argument, the above HIT program produces no better results than a moderate-intensity HVT and more frequent approach, it would appear logical to increase effort and reduce both volume and frequency to some degree in the HVT program. In this respect, exposure of long-term systemic wear-and-tear on the body would be more appropriate. The goal, then, would be to discover how *hard* one can train, for the most part, and how much volume and frequency is necessary in order to achieve an optimal response relative to the intensity level, and in accordance with the trainee's goals and trainability.

It should be evident further how irrational and pointless it is to create categories of HIT and HVT. Both groups follow the same principles of exercise science. Both groups integrate the same concepts within their workout philosophies. It is merely the direction and measure of those concepts and principles that vary, and this is true even within the same faction, whether HIT or HVT. Those within the HIT group argue among themselves in regard to "how much" is ideal or necessary. One such argument came from Mike Mentzer; he believed that one set per muscle is all that is necessary to stimulate growth, whereas other HIT enthusiasts argued this point vehemently.⁴ The HVT group tends to argue less among themselves, although each group or individual will promote specific methods still while following the *same* principles and concepts.

³ Selye, Hans. *The Stress of Life*. McGraw-Hill. NY: 1978.

⁴ Even the term HIT is inappropriate since "high" intensity could mean any value that is high relative to some other value. Ninety percent of one's full capacity certainly is "higher" than 89%, and 89% is higher than 70%, etc. If part of the philosophy of HIT is to train as hard as possible on all work sets, it should be termed *Maximum Intensity Training*.

Erroneous perceptions about HIT

Perception: “It is impossible to knock off the entire motor unit pool of Type 1, Type IIa, and Type IIb fibers from only one set.”

Foremost, what is meant by “knock off?” It can be presumed that the term refers to the eventual firing and exhaustion of all motor neurons, thereby all muscle fibers within said muscle group become fatigued. Notwithstanding, it is implausible to “knock off” all motor units (and likewise all fibers) even by means of multiple sets. A person would have to exercise to the point of being unable to contract the muscle. Even then, there would be muscle fibers not exhausted. The remaining fibers simply would be unable to lift the weight of the arm. In any case, not all myofibrils exert to the same magnitude throughout the length of a sarcolemma. Only as a muscle loses its mechanical efficiency — because muscular force deviates from a straight line — whereby it increases its girth at the point of full contraction, will progressively more myofibrils toward the center of a muscle be called upon to work. This is basic biomechanics. As a result, if an exercise does not afford adequate resistive force at a particular juncture, including the point of full contraction, then specific myofibrils will not work at that juncture.

Second, such a degenerative/exhaustive process, if it were possible, painfully would yield total incapacitation of the muscle for several days, accompanied by a reduction in potential functional capacity for several weeks. Overuse atrophy of the fast twitch fibers correspondingly would eventuate, since the endeavor to “knock off” all motor units would demand outrageous volume and intensity of effort.

Consequently, just how many sets, then, are warranted to “knock off” all motor units? And, if “all motor units” was an exaggeration of proposition, how many must be “knocked off” to bring about profits in strength and muscle? HVT proponents have suggested that ten or more sets are the requisite number, as reflected by their training protocols. But how was that conclusion reached, and which is it *exactly*: 10, 11, 15, 18, 20 sets, or more? To arbitrarily suggest 10, 15 or 20 sets is fatuous, since the performance of more sets than is necessary to achieve an optimum response becomes a superfluous act of masochism, and this would serve only to make greater inroads into recovery ability.

Strength training is the use of progressive resistance methods to increase the ability to exert or resist force; hence, the Overload (progression) Principle. To wit, constantly challenging current strength/force capacity, by either using more weight for the same number of repetitions, or performing more repetitions with the same weight (within reason, and without an attempt to optimize endurance), strength will increase accordingly. For most people, maximizing muscle mass does take more volume than one or two sets, but not much more, as suggested by the magazines, and so long as the effort is high enough. Fundamentally, the focus needs to be on quality effort rather than “how much volume”, although volume is important. The idea is to challenge a muscle’s capacity, and it is up to each individual to discover how many sets and how much frequency is required, relative to the intensity of effort. The idea is *not* to see how many sets can be performed in a workout.

Perception: “High intensity may be good in theory, but not in practice.”

A theory cannot be good and with its practice flawed. If a theory is not true to its corresponding actions, it no longer is (nor was it) a valid theory. The practice of specific, conscionable actions is the result of a theory. Moreover, HIT is not a theory, but a method and philosophy based on principles of exercise theory, viz., intensity, volume, frequency, load, and SAID.

Perception: “High intensity proponents are dogmatic.”

Dogma, as Ayn Rand stated, refers to “a set of beliefs accepted on faith; that is, without rational justification or against rational evidence. A dogma is a matter of blind faith.”⁵ If actions do not follow an established theory, they are left to pursue ‘gut hunches’, ‘blind faith’, and ‘subjectiveness.’ Hence, the actions become random and arbitrary. Both HVT and HIT follow the same principles of exercise science. Both groups, by and large, are just as dogmatic as one another since it is the measure of those principles over which people argue; yet it is the measure of those principles that *each individual* must come to discover for him or herself.

Perception: “Considering the warm-up sets that HIT trainees implement before their work sets, it really is the same thing as HVT; they’re still performing 2-3, or more, sets per exercise.”

There is nothing written in stone that HIT exercise cannot implement warm-up sets to facilitate a more efficient workout. In fact, in order to use a progressively heavier weight safely, to reflect the Overload Principle, often it is necessary to increase body core temperature and psychological preparedness prior to the work set(s). However, a warm-up that progresses beyond the requisite amount necessary generates additional stress and fatigue, and this can diminish total muscle force output. Hence — and this is the most crucial distinction between HIT and HVT — as with the workout, the warm-up must be kept to the minimum that is essential, and this will make the least amount of inroads into function so the greatest effect can be achieved with the work sets.

For instance, if 100 pounds for 10 repetitions is used for a work set (and continued to the point of momentary muscular failure or close to it), an ideal warm-up could consist of: 50 pounds x 3 repetitions, followed by 75 pounds x 1-2 repetitions, followed by the work set. Of course, the amount of warm-up depends on many factors, but this “minimal” warm-up does exemplify a point. That point being: The purpose of the initial two sets is to prepare both mind and body for intense work; yet, those sets neither fatigue nor challenge functional capacity. As can be deduced, and if we consider the extremely low effort one would expend on the initial two sets, those sets cannot be labeled ‘work sets’, nor do they contribute, to any consequential degree, to the total volume à la HVT. Many HVT perform at least 2-3 preparatory sets on every exercise, and some HVT enthusiasts “pyramid” the weight up then down for up to 10 sets per exercise. This is pointless and an overkill in many respects. Usually exercise methodology is based on social beliefs, such as the power and effect of “numbers”, and certain numbers repeat even in exercise, such as 1, 3, 5, and 10 (a ‘nice’ round number), or combinations thereof, e.g., 6 (3 x 2). It is no surprise, then, that many people perform three sets of most exercises, and often three exercises per muscles and usually 8 to 10 repetitions per set.

For those concerned about the risk of injury that might follow a brief warm-up, bear in mind that when slow, continuous, non-bouncing movement is implemented — as typically suggested by HIT practice — risk of injury remains relatively non-existent. Injury occurs when forces exceed the integrity of soft tissues, or from the inability for the tissues to remodel because of overuse, viz., too much volume and frequency and not enough recovery. Both factors can arise even under exorbitant warm-up conditions, and this can arise under explosive, bouncing, pliometric, and HVT practices, regardless of the number of warm-up sets.

A well-known periodization proponent advocates an extravagant warm-up prescription of 5 sets of an exercise, using the same weight, for the same number of repetitions (e.g., 5 sets x 5 repetitions x 300-pounds), and working to muscular failure only on the fifth set. He believes that one must ‘own’ the weight before subsequent workout increases are made — thus the need for replication. First, if the trainee were to complete the requisite number of repetitions with a given weight in the initial work set, would he then, at that time, not “own” it? If not, who does? Was the completion of that initial set a hallucination in the mind of the trainee... a fictitious occurrence?

⁵ Playboy interview. March 1964. p. 39.

Second, the degree of energy squandered on the initial 4 sets of 5 reps renders the athlete incapable of using a possibly greater weight than that eventually used on the fifth and final set. Perhaps he could have used 320 pounds for 5 repetitions if he had only performed a minimal (of what is necessary) warm-up, rather than repeating a task that was already within his capacity. Analogously, one does not observe sprinters running the 100-meter dash 4 times with slightly less than maximum effort. This would tax physical ability to run an optimal race later. Rather, sprinters jog lightly on the spot, and walk about to increase blood circulation, then they perform mild stretching for the ankles and knees. They may run the 100 meters 1-2 times at a *modest* pace to prepare mentally and physically better. At all times, the preparatory effort remains essential, yet minimal.

Perception: “Compare the number of champions using high-volume to that of high-intensity. Obviously high-volume is more productive.”

Champion bodybuilders and strength athletes are the elite within the population; outliers with respect to physical potential for building strength and muscle mass; on the far end of a bell curve distribution. Moreover, these individuals often utilize nightmarish quantities of drugs. They represent an infinitesimal segment of the population, and they are not a representation of the average resistance trainee. Hence, such a statement commits the Fallacy of Hasty Generalization, since this bases the presumption on instances that do not constitute a fair sample. It also commits the Fallacy of False Cause, since champion athletes are the result of their genetics and drugs, not of their workout practices. They would most likely have succeeded despite the method of exercise. Similarly, 80% of lower back pain sufferers convalesce regardless of the intervention, or lack thereof, and this indicates that traditional chiropractic and physiotherapy modalities are not very effective or necessary.

Many strength coaches who follow periodization and HVT methods boast of their clientele's progress; that they train NFL, NHL and NBA athletes with great success; that they are top coaches or trainers to the champions. Again, star athletes are not representational of the typical, and little consideration is given to the coach who teaches the sport skills; the latter may have been the reason for the athletes' success. Nor have I known any 'average' trainee who has made optimal progress on a HVT or a periodization approach as advocated by fitness magazines, with the exception of neophytes who suffer from under-use atrophy, and who often progress on nearly *any* program despite the program's inefficacy.

An objective indication of what exercise methods work would require a copious, random sample of experienced resistance trainees. They need to be experienced since nearly all beginners initially make progress on any program. Then one would need to measure their progress over a year span using a reliable body composition analysis system to determine ratio differences of lean and fat body tissue. Accurate strength increase measurements would also be useful, but testing must be conducted on specialized equipment to account for impact forces, stored energy torque, gravity, exact positioning, and internal muscular friction, such as the equipment offered through MedX. Of course, even individual genetic factors would have to be accounted for, and this is impossible relative to today's technology and knowledge.

Perception: “Although some champions have used HIT, many have returned to a HVT approach.”

Justification as to why a trainee might return to a different and possibly less effective method of exercise is complex and various. Some champions have done so as a result of peer pressure, philosophically suggesting tribalism and not individualism (since most of their peers are doing 'something else'). They commit a breach of integrity, in that they know what is right then they proceed through rationalization; they defy the truth that a different approach might be more effective and logical. (This is not to say that it is.)

Other champions can see a more easily traveled road through mindless, low- to moderate-intensity exercise and increasing anabolic steroid use. Conversely, HIT is irrefutably hard work, and it requires the utmost focus, determination and motivation for optimum success. Notwithstanding, HIT effort can be tolerated by nearly anyone — including the elderly — who has clear, objective goals and determination, and such training is not reserved for a special ‘breed’ of individual. However, not everyone has the mental fortitude or health to sustain such rigors continuously.

Another explanation for shifting from a HIT to a HVT approach may be downright ignorance in comprehending the vital connotations in regulating intensity, volume and frequency. Years ago, upon obtaining Mike Mentzer’s *Heavy Duty Arms* course, I integrated enthusiastically the suggestions within my routine, and I performed one set of rest-pause curls for biceps, together with a pre-exhaust set for triceps, once weekly. In consideration of my previous exercise practices of at least 10 sets for each muscle, such training truly was low volume. During this time I focused extra hard on the effort and quality of movement. After four workouts, I increased my upper arm size by a half-inch. Upon witnessing the expedient results, I thought that doubling the volume and frequency would be better. The conclusion was flagrant overtraining, overuse atrophy, and a loss of my gain. I concluded thusly that Mike Mentzer’s methods did not work, whereto I reinstated a HVT approach with less intensity of effort in a quest for progress that did not happen nearly as quickly. Rather than having realized that as I became larger and stronger that I would require more recovery time, I substituted this advice with the current-day orthodoxy: “be persistent and you will triumph”, and the infamous “more is better.”

Sometimes more is better, and sometimes less is better, whether in regard to volume, frequency, or intensity of effort. But it is illogical to uphold a philosophy that is based on a direction in measurement rather than the discovery of what the ideal measurement is.

Perception: “HVT is hard on the joints and tendons.”

It may be presumed that such a notion stems from the nomenclature HEAVY Duty, as coined by Mike Mentzer, in the belief that the weight (force) must be ‘Heavy.’ This is not necessarily so, since ‘heavy’ primarily refers to the percentage of a trainee’s maximum lift. Of course, as with any weight training method, progressively heavier weights are routinely used with HIT; but HIT typically incorporates moderate-force activity, associated with a resistance that can be handled for 40-120 seconds tension time⁶, while moving under muscular control. Some methods, such as rest-pause, will necessitate heavier weights, but this method is not commonly employed or recommended on a continual basis.

What is “hard” on the joints and tendons are impact forces and excessively frequent exercise. In the first instance, muscular control eliminates dangerous impact forces; jerking, bouncing, and throwing. In the second instance, too frequent exercise will not allow for adequate tendon remodeling. Tissues proceed through a period of transient weakness as they adapt to exercise, and the tissues’ mechanical strength diminishes at some point when remodeling. This situation is reflective of both muscle and tendon, although it is slower for tendons because of a poorer blood supply. Hence, a sequence follows of degradation, compensation, then overcompensation. If there is inadequate time for necessary adaptive responses, these changes cannot transpire, regardless of the exercise protocol — high- or low-volume... high- or low-intensity. Another long-term effect from too much exercise is osteoarthritis, and this is evident with people who train too much, too often, and with poor technique. In effect, the goal should be to perform only enough exercise with enough intensity of effort to achieve one’s goals, regardless of the philosophy or methodology in place.

⁶ Arthur Jones, the father of “brief, intense exercise” recommended a weight that would allow at least 8 repetitions, and preferably 10-12 repetitions, but not more than 20 repetitions.

Perception: “HIT has some value, but it is short lived.”

If a particular method of strength training has value, why would it be short lived, or why would it cease to be of value? A value is that which one acts to gain and/or to keep. As Ayn Rand stated, “Value presupposes a standard, a purpose and the necessity of action in the face of an alternative. Where there are no alternatives, no values are possible.”⁷ If "high-intensity" has value, it must possess such in the face of an alternative that does not have that particular value; the only diametrical alternative is "low-intensity". Since the value of high-intensity effort is to invoke optimum strength development and muscle growth, low-intensity would be the opposite, viz., a high rate of muscular endurance.

The reasons for something to be short-lived are numerous, including over adaptation to the stimulus and that the demands of exercise are too low or too high (the measure of any of the principles is not sound and relative to the trainee at any particular time). These factors also are possible with a program, including those with a focus toward higher volume and moderate intensity. It is not the intensity that is necessarily at fault, but a combination of the factors that constitute the program as a whole.

Perception: “The only reason HIT initially works is the result of previous overtraining conditions supervened by additional rest time and briefer training sessions.”

If volume and frequency reduction resulted in strength and muscle mass increases (the desired commodities), what purpose lies with a subsequent volume and frequency increase? Why would one leave an effective program for another program that would cause overtraining? Why fix what is not broken? Obviously, altering training demands allows for either repose (fewer demands) or to better challenge the body (greater demands). Consequently, doing too much volume necessitates lower volume, and doing a very low amount of volume, relative to an individual's upper tolerance level, necessitates a higher volume... some of the time. An ideal direction is to cycle exercise demands, and the above perception can be turned around and applied to a HVT approach. In effect, “the only reason a HVT approach works is that the previous reduction in exercise demands lasted too long”.

The body is constantly in flux, and what may be too much at one point, may be too little at another point, and vice versa.

Perception: “I've tried HIT, but it didn't work for me.”

The reasons behind this claim are numerous, but they can be limited to four causes. First, most HVT trainees perform exercise with reckless biomechanics, and this includes ballistic and explosive movement. If this were not so, it would be impossible to perform the volume these individuals enthusiastically incorporate, of at least 10 sets per muscle, and upward of 20-25 sets as evidenced with many magazine-based routines. Such shoddy technique is evident if one were to view the various bodybuilding videos available on the market, or if one were to visit nearly any gym.

⁷ Rand, Ayn. *For the New Intellectual*. Random House. NY: 1961. pb 121.

To illustrate, I previously trained a woman whom, at the time, performed 3-5 exercises for 3 sets each per muscle. She trained each muscle once every 5 days. I drafted an initial routine that consisted of 1-2 sets per muscle, with a frequency of once weekly for each. Three weeks into the program, she felt discouraged because of non-existent strength and muscle gains. Upon observing her form, it became apparent that her muscles were not being stimulated sufficiently, through controlled tension, relative to the volume and frequency; she jerked the weights about ferociously at times. After a reduction in velocity, and demonstrating various isolation techniques, she literally felt debilitated within a few sets, much to her stupefaction and delectation. Thereafter, she produced the best gains of her exercise career in a matter of two months. Since there is a distinction between quality and quantity, the two could not coexist — just as Capitalism and Communism, or logic and mysticism cannot coexist.

Second, HIT training requires high motivation to sustain the rigors, and this is why it is all right to reduce intensity of effort and to increase volume now and again. It is not an easy approach to exercise, nor can everyone cope with the assiduous and requisite psychological and physical challenges. If a trainee is not 'there' at all times, optimal progress cannot be anticipated or achieved. However, such is required when exercise is reduced to as few sets as advocated by HIT proponents. HITers believe that the goal is to challenge the muscles as hard as possible; the goal is not to discover one's stamina. To maximize strength and muscle *is* hard work, and hard work must be conducted in a brief period of time, whatever the measure happen to be.

Third, trainees who are new to very intense exercise, who have trained with a high-volume and moderate-intensity beforehand, are oftentimes overtrained or they are not mentally attuned for HIT application. In the former instance, being in an overtrained state requires rest, not continued exercise of a more intense nature, even with a reduction in set volume. A drastic reduction in volume and frequency will not prove advantageous always. Once in an overtrained predicament, a total layoff is the only logical recourse, to help return the body to a non-exhaustive and responsive state. Unless this condition is absolute, no method of strength training can be productive, and this includes HIT. In the latter instance, being able to generate maximum effort in a set, both mentally and physically, takes time and a set reduction that is too extreme may not prove advantageous either. Only as intensity increases should volume and/or frequency decrease, to better balance the fundamentals.

Lastly, and most importantly, people who try a new method, such as HIT, try a single program *of a certain measure*, based on a particular philosophy or direction. The measure of intensity relative to the volume, frequency, and every other aspect may not have been ideal for that individual. If it were, progress would be optimal, regardless of the "philosophy" or categorization of the program.

Why HVT?

Premise: "It is necessary to work muscles from multiple angles in order to stimulate development and strength throughout the entire strength curve."

Implementing a variety of exercises certainly helps in many regards, and this includes injury prevention. Working the same paths in the same manner can result in overuse injuries and neuromuscular imbalances. In regards to hypertrophy, muscles contract progressively from points of origin to insertion. You cannot, for instance, develop the outer pectorals from the inner pectorals, nor the lower biceps from the upper biceps. However, exercise change, to include sufficient variety in both selection and program strategy helps to keep muscles from adapting to the stimuli. Moreover, this direction is not the sole domain of HVT. Those who follow HIT are free to cycle exercises and methods within their philosophy.

In regard to the acquisition of optimum strength, throughout a full ROM, a viable solution would be to incorporate variable resistance machines.⁸ These machines render fairly consistent effort throughout the entire range of movement, and this makes work more demanding as full contraction eventuates, muscular efficiency decreases, and as progressively more myofibrils participate.

However, even variable resistance is not the most crucial factor to acquire strength — it merely makes the application of exercise more productive per unit of time. Rather, the crucial factor is the effort generated. The deadlift, squat, chin-up and bar dip remain some of the most exhaustive and productive exercises, yet each only tax the strength curve of the various muscles through a portion of their ROM. The inclusion of additional exercises to work the stretch, midrange and contraction points of a muscle's range of motion is a viable solution, but it must be done cautiously since the more exercises performed in a workout, the greater the likelihood of an overtrained state.

It is true that being strong in the squat does not make one correspondingly strong in the leg press or lunge, since neuromuscular adaptation among exercises differ. However, there are dozens of movements for each body part, and this raises the following questions: Which exercises should be included? How many exercises should be included? How often should exercises change or vary?

As an aside, many HVT authorities clearly understand that being strong in one movement does not make a trainee correspondingly strong in another, i.e., “include a variety of exercises to affect the strength curves at all angles”. Yet some of them cannot grasp this connection within sport specific biomechanics, such as throwing a ball, a football tackle, or rowing a boat, viz., sport specific skills must be practiced to demonstrate strength within the sport properly and optimally. Resistance training merely serves to increase strength generally, thereby force output is enhanced in sport activities. Nevertheless, many coaches are inclined to prescribe power cleans, jump pliometrics, and snatches supposedly to increase an athlete's overall ‘explosiveness.’ If this method worked, world class Olympic lifters would, likewise, be world class rowers, football players, hockey players, etc.

Premise: “You require variety in your program, and this means altering training specifics (i.e., strength, power, mass, endurance), and velocity (i.e., slow, moderate, fast/explosive). This can be accomplished only through periodization methods.”

Since the objective of most athletes who follow periodization strength training methods is to increase demands to increase function constantly, viz., the Overload Principle, the inclusion of specific training methods to enhance strength at one point, power at another point, etc., is groundless. For example, Strength is *the force generated by a muscle or muscle group*. Power is equal to force x distance ÷ time. Although strength can exist without demonstrating power, i.e., isometrics, power cannot exist without strength being demonstrated. Likewise, speed of muscular contraction is dependent on force (and the skills involved to demonstrate the power of a particular action), since greater force means faster movement.

⁸ It has been argued that conventional exercises tax only one-third of the strength curve because they do not load a muscle at every point of a ROM adequately. Therefore, greater variety is necessary with free weight and conventional training methods than if one were to use variable-resistance exercise equipment.

A person can become stronger without becoming larger, but when a person increases lean mass, the greater cross-sectional area will result in greater force production.⁹ Consequently, to include a "mass" phase, whereas strength and power remain in their separate and distinct phases, is irrational; and to include a hypertrophy phase whereby a trainee might not want to become heavier in body weight is irrational. The problem is, few periodization models disregard different phases of physiological goals to be achieved, and they do not address unique requirements of different athletes or trainees in that regard.

Premise: "HVT methods, like periodization, implement active rest, and this allows for continued exposure to stress while the trainee recovers. This is known as 'loading' and 'unloading'; the alteration of light and heavy weights from one workout to the next. The result is no loss of neurological conditioning and a constant stimulus for regular progress."

This is where confusion lies, in the premise that lighter weights (even if carried to the point of muscular failure) is "low-intensity", as opposed to the "high-intensity", heavier weights. Regardless of semantics, effort is effort, and 'A is A'. Exercise in any capacity, whether light or heavy loads are implemented, physically results in localized and generalized stress to the body. To adapt and grow stronger, the body must follow a sequence of steps: energy replenishment, compensation, then overcompensation. If the first and second steps are intervened, through continuous assaults of localized stress, even of varying weights, the general affect on the entire system negates the possibility of overcompensation (as least at optimum levels), and this will hinder progress. The result is stagnation or possible overtraining. "Active rest" is an oxymoron. Recovery and activity cannot coexist, since each has a particular identity, and they subsist as separate entities.

Neurological conditioning is not lost over the course of weeks, let alone months. This is particularly true of anaerobic capacity, and it has a much longer deconditioning and detraining period than aerobic capacity. Such is evident with HIT trainees who perform specific exercise movements only every 2-3 weeks, yet they continue to become stronger (more proficient at specific exercises). Moreover, it is not uncommon for a trainee to exclude an exercise for several months, only to resume where he or she left off. The skills of the squat, for example, are not lost from a brief period of neglect, e.g., while leg presses are performed, and such simple tasks cannot be analogous to the technical discipline and cultivation of neurosurgery, for example.

Exercise movements are natural movements in consonance with man's biomechanical tendencies, neither of which demand years of exercise experience to acquire, nor days to relinquish neurological adaptation. A world-class Olympic lifter once stated that after 15 years of training he was not content with his lifting technique. What a discouraging predicament, as this suggests that he must suffer from a neuromuscular condition.

There certainly is a time and place for lower effort work. It is not to allow for rest, but to decrease the demands so as not to overreach one's abilities too often for too long. Activity of a lesser demand helps to maintain muscular condition and strength, but to imply that it is necessary for "rest" is erroneous.

⁹ There are rare instances whereby a muscle becomes so large that it loses its mechanical efficiency and it will be no stronger, but this is highly unlikely without the combination of anabolic steroids and very good genetics.

Premise: “Because of years of conditioning, advanced trainees can and need to perform more sets than beginners.”

This is both true and false, and it depends on the context of the statement. Beginner trainees are characterized as having disuse atrophy of the fast-twitch fibers, from lack of previous intense neuromuscular stimulation. Therefore, beginners are more apt to flourish under conditions of higher volume, at least initially and eventually until they adapt to anaerobic conditions and learn to train hard. In effect, before the onslaught of strength training, most individuals possess greater endurance characteristics, as suggested by the SAID Principle, and as reflected through their previous standard of low-intensity activity. Confusion then arises when function stagnates or regresses. Trainees are often unable to conceptualize why their programs are no longer effective since, up to that point, they produced results. Then they believe that more exercise must be the solution. As a result, trainees often convince themselves to walk further off the beaten path of a rational strength program toward the "more is better" idiom.

Stress physiology adamantly states that as an organism (trainee) becomes larger and stronger, the demands of stress — not the duration of stress — must also increase, and this will alter homeostasis and adaptation, i.e., greater strength and muscle mass. Antithetically, recovery ability remains only modestly enhanced, since it is dependent on the reactionary time constraints of endocrine and soft-tissue remodeling limitations. There is improvement, but it does not balance with strength and muscular progress. Analogously, consuming more protein or vitamins than the body can assimilate and utilize is not beneficial, and this can result in auxiliary systemic strain. Unlike values, ethics and money, the idiom "more is better" cannot be practiced within the discipline of exercise.

On that note, it is true that in order for an advanced trainee to increase function and muscle mass, at least to a noticeable and immediate extent, the demands of exercise must increase sufficiently. This includes intensity of effort, volume, frequency and the use of set variables (as well as a change in the strategy implemented). Obviously if the trainee is already exercising to muscular failure, the factors that remain must increase. Regardless of what increases, the problem is, most trainees will implement a program of "more", but they often do not reduce the demands before they enter an overtrained state from doing "more"; to know when to implement "less". In this context, the philosophy of periodization or cycling of demands is vital for long-term success. However, the nature and philosophy of periodization, as it stands in Western countries (strength, power, mass, and endurance phases), is illogical and the recommended training volume and frequency superfluous.