

The Current State of Strength & Conditioning

Mark Rippetoe: 2014

Here's what you need to know...

Some of the worst strength and conditioning coaches in the industry are found at the D1 university and professional levels. Hiding behind the innate talents of the genetic phenoms handed to them by skilled recruiters, these coaches bask in glory as they squander the talent of their athletes.

The ability to display power is largely controlled by genetics. Explosive athletes are born that way. Athleticism is not very trainable, but strength is. An increase in strength increases the ability to fully display athleticism. So why aren't "strength coaches" focusing on strength development in 2014?

What detracts from effective, sport-applicable strength training? So-called functional training, stability work, agility training, incorrectly coached and applied Olympic lifting, machine exercises, corrective exercises, core-specific exercise, and an overemphasis on conditioning.

Barbell training with progressively increasing loads on the basic exercises increases strength, power, and all of the other dependent characteristics – for everybody, and for several years.

Note to Future Readers

This essay is about the state of the strength and conditioning profession in 2014, most of which is practiced in high schools, colleges and universities, and at the professional sports level.

Those of you reading this in the distant future, while you drive your flying cars (please be careful), may observe with amusement that all these problems have long since been corrected – if I have even described them accurately here in 2014 – and my concerns turned out to be about as relevant to your advanced civilization as global warming.

From atop your glacier, you may look down on a landscape devoid of weak, overtrained athletes, and wonder just what in the hell I was so concerned about. I hope so.

Full Disclosure

I have never served as a strength coach for a university or professional sports team. I have coached thousands of individuals, but never a large group of elite athletes selected for the program by well-paid recruiters or a draft system.

I do not know how to integrate relatively inexperienced freshmen with advanced seniors, how different levels of training advancement within the team affect the organization of the workouts, or how to make sure everyone on the team achieves the highest level of his strength and performance potential while struggling through an ineffective program that focuses on the expressions of developed strength and performances of strength-dependent activities in the weight room and on the practice field, as opposed to the developing of strength.

The problem is, most D1 and pro-team S&C coaches don't know these things either, because a program like this doesn't make any sense. Some of the worst strength and conditioning coaches in the industry are found at the D1 university and professional levels. And as long as misunderstanding and incompetence can hide behind the effective recruiting of outstanding genetic talent, the problem will persist.

"Shut Up, Rippetoe!"

I know what you're already saying: Rippetoe doesn't know anything about the coaching of strength and conditioning at the university and professional level, and he should just shut the fuck up.

Okay, I will. Later. Right now, my thoughts are intended to make a few people think about what they're doing in the weight room.

To kick things off, strength is the basis of advanced athletic performance. For all but a handful of sports, the stronger athletes are the better athletes. Power is recognized as the most desirable of athletic attributes, and power is the instantaneous display of strength.

Power is dependent on strength, which can be developed for a long time, and the genetic capacity for explosion, which can't really be developed very much.

A Definition of Terms

Exercise: Physical activity done for the effect it produces today, e.g. hot, sweaty, tired, sore. A workout done to make oneself feel productive, just because the workout got done. Not to be confused with an exercise, which is a movement pattern done within a workout. Exercise is just fine for non-athletes.

Training: The process of producing a specific physical adaptation over time. Workouts are the constituent components of a training program; exercises are the constituent components of a workout. Workouts within a training program are important because of the effect they have on the process. Strength training is the process by which an increase in force production capacity is developed.

Practice: The repetitive execution of sport-specific skills that result in greater technical perfection of movement patterns. Practice occurs on the field in the context of the sport; strength training occurs in the weight room. If your sport is lifting, practice and training must be considered more carefully.

Performance: The execution of physical activity in a competitive setting for the purpose of beating an opponent, winning a competition, or setting a personal record. Training prepares an athlete for performance – workouts within a training program are not performances themselves.

The Following Things are Always True

1. Strength is the ability to apply force to an external resistance, like opponents on the field, the ball, the bat, and the barbell. There is only one kind of strength – the kind your muscles generate when they contract against your bones, a system of levers that interacts with the resistance encountered in your environment.
2. Power is strength displayed quickly. The math is: force x distance/time, or force x velocity. Power is essential for athletics because most sports depend on explosive action. Power is best measured by the standing vertical jump (SVJ) test.

3. The ability to display power is largely – and I mean largely – controlled by the genetics of the athlete. Explosive athletes are born that way, and it is apparent to the trained eye when they are children. "Sproingy" little kids are standouts in youth sports. Those of us that played against them remember the embarrassment quite clearly.

Many effective national training programs have taken advantage of this by identifying and recruiting pre-pubescent talent, and then channeling these kids into developmental programs that work primarily on technique until the later Tanner stages indicate an anabolic hormonal profile. Then, strength training can begin in earnest to take advantage of the kid's athletic ability by developing a strength base that allows for the display of their explosive ability.

4. Most reputable coaches agree that, after puberty, an improvement of 20% in SVJ over the course of an effective S&C program is a generous estimate of what you can do for an athlete.

This is why the SVJ test is so valuable: it cannot be very effectively influenced by training, and as such it is a very accurate gauge of the athlete's genetic potential for power development. This is why we recruit athletes with big SVJs. Since we can't turn an 16-incher into a 32, we'd better hire the 32s. The only place that can turn a 16 into a 32 is the internet.

5. Just like power, some people are stronger than other people, even before they've been trained for strength. Normally, the untrained guys with a big vertical are also going to walk into the program stronger than the guys with the low verticals. Again, genetics. It's just not fair. But we'd better pay attention anyway.

6. To the extent that power can be developed, an increase in strength is the most productive way to do it. In every instance, the athlete that deadlifts 500 can power clean more than the athlete who deadlifts 200. Athleticism is not very trainable, but strength is. And whatever the level of athleticism, an increase in strength increases the ability to fully display that level of athleticism.

Lots of ineffective wheel-spinning in an attempt to increase athleticism merely makes the more effective strength work harder to recover from. Squats, presses, and deadlifts are not just three more exercises we need to include – they should form the foundation of the program, and agility drills are just not very important.

7. We know how to make people stronger. It doesn't involve single-leg anythings, single-arm anythings, sub-maximal light-weight anythings, partial range of motion anythings, or running around the weight room yelling about what badasses we all are.

It involves an accurate assessment of the athlete's current strength level, and the application of effective training principles that progressively increase the athlete's ability to apply force. And this is best accomplished with barbells used effectively.

This list of things is why the strength and conditioning programs within the athletics departments of high schools and colleges and universities are so crucial to the development of athletic talent, and why so much athletic talent goes undeveloped. A strength increase – especially the strength increase that a genetically talented young athlete is capable of – has the potential to increase power and performance by truly staggering amounts.

At the level of professional sports, strength coaches can't take a terribly aggressive approach to their athletes. We've hired these guys to play for us because they're really good already, and we don't want you to hurt them in the weight room.

When they get hurt on the field, you help fix them and get them back in the game. If they hurt themselves in the off-season, by doing a bunch of CrossFit stuff or mountain bike racing, help with their rehab. Keep them in shape, counsel them about not doing stupid shit like becoming a vegan or only doing yoga. But don't be showing a Peyton Manning or an Aaron Rodgers how to squat snatch if he doesn't already know how, because Peyton and Aaron are just fine like they are.

The Entire Problem Starts Here

Most modern S&C programs are not developmental. They simply rely on the native ability of the high school recruit to produce progress and not the proper use of the weight room itself. Often these programs do not develop the athlete any more than 4 years of normal growth would.

Here are my thoughts. Feel free to tell me to shut the fuck up, later.

The Olympic Lifts?

The practicing of power-dependent movements does not build strength over the long term, and strength is the basis of power.

Cleans and snatches are useful for improving the athlete's ability to convert his increasing strength to power production. But they cannot build increasing strength by themselves because power and technical ability are the limiting factors in performing snatches and cleans.

Strength is the aspect of power that is the most trainable, but snatches and cleans do not depend solely on strength, so they cannot develop it, unless the lifter is a rank novice for whom anything acts as a strength stimulus. For more advanced lifters, snatches and cleans display power, but they do not develop the strength variable in the equation because of the limiting effect of the other variables.

Technique must be practiced, especially if Olympic weightlifting is the sport, and the ability to explode is limited by genetic endowment. We clean and snatch in preparation for other sports to keep the display of power efficient and to drive power along incrementally so that it keeps pace with increasing strength.

But ultimately, power depends on force production, and if you're not strong enough it doesn't really matter how naturally explosive you are. A lineman who squats 315 can't hit as hard as a lineman who squats 675, even if the weak lineman has a higher SVJ.

The college football version of snatches and cleans usually leaves much to be desired anyway. It's possible to find videos of "spotted" power cleans proudly posted on the web. I'm waiting for a "spotted" snatch, and I predict I won't be disappointed.

Many programs utilize the hang-versions of the lifts, which reduces the range of motion over which power must be produced, and correct technique is not emphasized, or even encouraged in many cases. There are hundreds, if not thousands, of videos on the web that conclusively demonstrate the university-level S&C coach's inability to coach these fundamental exercises.

Gentlemen, if you can't teach a D1 scholarship athlete – a physical genius recruited for his athletic ability – how to clean and snatch correctly, and you can't be bothered to learn how to do so, you have no business holding a job as a D1 strength coach.

In fact, since there exist so few examples of correctly instructed cleans and snatches in any high school, college, university, or professional strength program, and since it seems to be impossible to convince you that 1.) doing them wrong is a bad idea and that 2.) you're doing them wrong, I really think you guys should just stop using them in your programs altogether and just focus your attention on getting everybody's squat below parallel, and getting everybody's deadlift up over 500 with a flat back.

Maybe stop them from bouncing their bench presses off their chests like trampolines, too, and give their spotters a different way to work their traps. Given several months, perhaps this can actually be accomplished.

"Functional Training?"

An interesting phenomenon, "functional training" is a fairly recent development in S&C. Derived from the practice of Physical Therapy with injured and sick patients, it primarily relies on the use of sub-maximal (light) weights moved through varying ranges of motion in the context of solving a balance problem.

The term "functional" is used because it is thought to be more like normal human movement, and therefore more closely mimics the "function" of normal movement patterns than machine-based exercise. Fortunately, it doesn't take much to improve on machine-based exercises. In most cases, the ability to balance the body and the relatively light load is the limiting factor in the amount of weight used in the exercises, not the weight itself.

The theory is apparently that ipsilateral and contralateral movements are so useful in developing "the core" – the muscles that stabilize the spine – that they are therefore sufficient for the production of useable athletic strength, to the extent that heavy barbell exercises are not necessary. Apparently spinal stability is unimportant in a 600 pound deadlift. The athlete is instead placed in positions of inherent instability and expected to perform stably, damn the force production, damn the increase in force production, and damn the heavy deadlifts.

If it seems obvious that light weights cannot improve strength, and that practices of even dubious effectiveness when used with injured populations have no bearing on healthy young athletes, that's because it really is. Despite this obvious silliness, many S&C programs around the country have devolved into programs that produce neither strength nor conditioning, under the guise of being "functional."

It's important to remember that you can fall down while squatting, pressing, and deadlifting heavy weights, and you learn not to the first day of training. But the balance problem remains as a factor to be dealt with every time you train, even as strength increases rapidly under the bar. The fact that you don't fall down means that you've solved the balance problem while keeping the focus on lifting heavier weights, and therefore getting stronger while remaining balanced.

Are "Core"-ections Really Necessary?

Most "functional training" advocates would agree that squats are "functional" movements, but that inherent inadequacies in an athlete's "core strength" or "muscle imbalances" or something "not firing" limit a squat's usefulness until these inadequacies have been addressed by "corrective exercises."

The squat is its own corrective exercise, as is every other technically correct barbell exercise which uses each component of the kinetic chain of the exercise in its anatomically-determined role to move a loaded barbell through an effective and complete range of motion while remaining balanced over the mid-foot.

Perfect technique assures that each component contributes its correct share of the effort, that using a weight that permits correct technique strengthens all the kinetic components, and that increasing the weight gradually while maintaining perfect technique increases the strength of each component in proportion to its anatomically predetermined role in the movement and therefore within the system as whole, the system we use on the field.

A lineman who can squat 675 has a stronger "core," and a stronger everything else, than a lineman who can squat 315 – or a lineman who only does weighted lunges – and he can hit you harder too.

Despite this fact, a growing trend within the S&C profession is to limit the weight with which the athlete trains, that there is a point at which the athlete is "strong enough" and no longer needs to train for strength. Many schools do not let their athletes squat heavier than an arbitrary limit – for example 500 pounds – because "he doesn't need to."

Competence and Brass Tacks

The ability of an athlete to lift heavy weights seems to be a liability in the minds of some S&C coaches. If they're courageous enough to venture into the realm of barbell training, they don't allow their athletes to reach their full potential because the weight on the bar "looks too heavy."

Oftentimes, coaches will brag about not lifting heavy, and how they focus on "core strength," "functional training," and speed/agility movements instead. This is simply a layer of bullshit to cover for the fact that they are not sufficiently competent to coach an athlete capable of squatting 600 for reps.

It takes diligent, effective advanced coaching to work with an athlete who is squatting 600 for reps, because he needs to be programmed carefully and coached to a high level of technical perfection. This is what makes the 600 safe and effective for the athlete. The fact that the coach doesn't know how does not excuse the fact that an athlete with this potential should be allowed the opportunity to develop it, and that it's the strength coach's job to do so. If he can't, he's in the wrong profession.

It should come as no surprise that not every strong athlete is good at performing "functional movement" displays, but the question then becomes, how much does light balance work actually contribute to field performance, and does it contribute more than getting a weak athlete stronger?

Because if dancing is going to replace heavy squats and deadlifts, there had better be a damn good reason. There are many strong lifters who can't perform a "pistol" – a one-legged bodyweight squat, basically a balance trick for a light bodyweight – who can still manage to squat 600 and not fall down. And who performs better on the field, the weak pistoleer or the strong squatter?

Again, strength is force production, and light weights neither demand nor develop force production. But it is much easier to coach alternate-leg dumbbell lunges than heavy squats or cleans. Exercises using one or two joints and very light weights are always easier to coach than heavy exercises where technique is absolutely critical, because if you screw up the coaching when the weight is light, nobody knows.

Matching Specifics

Another aspect of the "functional" misunderstanding has crept into the weight room: the idea that your strength exercises should look like the field position in which you're going to use the strength.

It actually didn't creep in recently; coaches have been telling athletes to squat with their offensive line stance and bench with their defensive line hand position (perhaps the origin of the Football Bar?) for a long time. I have personally witnessed a Physical Therapist "coaching" a softball pitcher by having her slowly perform the underhand swing with a 3-pound chrome dumbbell.

And I have it on good authority that in preparation for the 2014 USA Track and Field Nationals, the sprinters from the US Olympic Training Center in Chula Vista, California were doing hang power cleans, starting from a split stance and finishing by reversing the split with the back foot shifted to an elevated box in the front. This was done with straps – you know, hands tied to the bar so you can't get away from it very fast in the event of a miss.

It was said to be "specific to sprinters, to help with their start." This eliminates the need for developing a strong clean from the floor, which, of course, is just not necessary, and of course this mess of an exercise poses no threat to the wrists, knees, or backs of the national team sprinters. The weight is very light, after all.

The myth of full squats and knee destruction finds additional justification here as well, since no sport except powerlifting (and this is really not true in the recreational federations) uses a full range of motion in a judged squatting movement in competition. It's absolutely amazing to me that right now there are people operating in the field of strength and conditioning who still somehow believe that squatting below parallel injures the knees.

I suppose these people also believe that you catch a cold when you go outside in the winter, and that playing with yourself makes you go blind. Maybe it has.

Practice Makes Perfect

It may seem reasonable to try to match strength movement to field movement, but it's really not. Not at all.

It waters down the effectiveness of the strength exercise, and strength, not field specifics, is the point of squats, deadlifts, and presses. You squat with the technique that most efficiently improves your strength in the squat, and then you practice handling your now-stronger hands and feet correctly on the field. That's what practice is for – learning important stuff like how to take your stance correctly, and remembering that you're not in the weight room this afternoon.

Taken to crazy extremes, like shooting a heavy basketball or swinging a heavy bat, this misplaced specificity interferes with an already difficult-to-make-precise movement that is best practiced under the precise conditions in which it will be performed.

High-skill practice-dependent movements, like throwing a pitch or swinging a racquet, that are dependent on the accurate and precise control of the hands and feet, are fundamentally different from the basic barbell exercises, which use the large muscle masses at the center of the body working together to accomplish the relatively simple task of keeping the load in balance over the feet.

As a general rule, the lighter the "field implement," the more sensitive the motor pathway is to alterations from load, and the heavier the implement, the more beneficial heavier implements might be. A 20-pound shot makes more sense than an 8-ounce baseball.

This is also true of the barbell, with the relatively lighter Olympic lifts that use a longer ROM being more practice-dependent than the heavier and shorter ROM squat, deadlift, press, and bench press, which are used for developing the strength that underlies power. Repetitive practice is for sports execution, and strength training is for strength and power. The two are separate activities, and both must be a part of effective athletic preparation.

Field practice is motor skill development, and it must be done in exactly the way you intend to perform it in the game or the meet. One of the problems with "functional training" is that it is neither strength training nor field practice, but rather an ineffective attempt to average the two. It's too light to make you stronger, and it's too different from your sport movement to constitute field practice.

It's the bastard child of S&C, and it needs to stop.

Welcome to the Machine?

Exercise machines don't make anybody any stronger, unless they've done absolutely no previous strength training. Even then, they make novices stronger for about six weeks. This is unfortunate for a college student who plans to be there longer.

Anybody who has been in this business long enough to have seen novice lifters become advanced knows firsthand that while deadlifts can improve for years, leg extensions get strong for about six weeks, and then they either get stuck or your knees start hurting.

It should be obvious that a strong man can move the whole weight stack more times than a weak man can. A 600 squatter can leg extend the stack and leg press all the plates that will load on the machine for 20-rep supersets. In fact, the best way to improve your leg extension and leg press is to get your squat up to 600. The other way around doesn't ever work, and it's extremely important to understand why.

Exercise machines isolate muscle groups and work them separately, and basic barbell movements use all the body's muscle mass as a system. Muscles operate the system of levers (the skeleton) which moves the loads we encounter when we use our bodies.

Machines use only one or two levers at a time, while the deadlift uses all of them while standing on the ground with the bar in your hands. Since the whole system can move heavier loads than the pieces of the system can, barbell training stresses the system more effectively and produces a strength adaptation better than isolation work.

Machines also remove the balance component of an exercise – the falling-down part of the movement. Even machines designed to look like barbells, like the loathsome Smith machine, lack the capacity to train the balance portion of effective strength work. Sitting in a machine moving a lever around lacks so much of what we need to get stronger that almost anything is preferable.

Machines don't work, and machines are therefore undesirable. Everybody already knows that machines are undesirable, since dozens of studies have demonstrated their lack of effectiveness, and yet they persist in the environment, somehow. Like carp, or those fucking zebra mussels.

The most logical explanation for this is that they require absolutely no coaching ability to administer, and they are easy to drive up to limit intensity, thus making the inexperienced or undeveloped coach look like he knows what he's doing.

Leg extensions are easier to coach than proper squats. If the sport coach wanders downstairs occasionally and sees the whole team busting its ass on a Hammer Strength circuit, he can't help but feel a sense of accomplishment for his kids and a firm confidence in his strength coach, especially if he doesn't know anything about strength training himself.

Machine-based programs are going away, and one of the reasons is that the "functional training" model is a reaction to the lack of athletic application inherent in sitting down in a machine and operating the levers. It was developed specifically to address the fact that exercise machines don't improve athletic performance. "Functional training" is killing machine-based programs faster than barbell programs are, and for that I applaud them.

Given the choice between dancing around on a BOSU ball with a chrome dumbbell and doing leg extensions, I'll take the dance class because I'm less likely to develop tendinitis. But neither of them effectively approach the task of driving athletes toward their strength and performance potential.

Personal Anecdote

Machines don't work as well as barbells, and I figured this out at my first job in the business, back in 1978 at the Spa International and Nautilus Training Center in Parker Square, Wichita Falls, Texas.

I'd been lifting long enough to have gained some strength and some muscular bodyweight, and the guys who trained with the Nautilus instructor hadn't gained a pound. He left on vacation one week, and I took a little experimental group onto the main exercise floor and had them squat, bench, and deadlift for a total of three workouts. I gave them no diet instructions at all.

By the following Monday, the least amount of bodyweight gained was 3 pounds, and some had gained 7. All were stronger, even on their Nautilus machines, having been stuck there for varying periods of time.

This was not a study, but I'm not a scientist, and not everything I've learned has been learned from work done in someone else's lab. I had machines in my gym for many years, and they were a complete waste of time for everyone healthy enough to lift barbells.

Machines can be an important part of an exercise program for the casual active person. They have no important role in the training program of an athlete.

Partially Strong?

Perhaps the most tiresome thing to have to explain is why a full squat is better than a half squat, and that numbers can obfuscate the correct assessment of an athlete's true strength. In fact, I'm not going to insult your intelligence with a long essay on more muscle mass used over a full effective range of motion, its contribution to greater strength and its greater applicability to field performance. You've all read the excellent papers by Hartmann and the explanations in my books, and if you haven't, you should.

Instead, let's talk about why partial squats and partial bench presses are so popular. It's because they can be done with heavier weights. That's all there is to it.

Big numbers are cool, even at the expense of the truth. If your lineman's 650 was done with three spotters – two on each end of the bar and one doing the power hug from the back – the 650 is bullshit. And deep in your little pea-sized heart you know it. If his 500 bench was "helped" off his chest by you or a cable tied to the bar, the 500 is bullshit too.

A Lie, Agreed Upon

No sane person actually believes that a 650 quarter-squat with three spotters is better for anything than an honest 450 full squat, that it's better for your knees and back to be loaded with more weight than you can really handle over a full ROM, or that holding a weight over your throat you can't control by yourself is a good thing, even with a highly-trained CSCS spotter.

No, people, nobody is this dense. All coaches know that stronger is better, that stronger means more weight on the bar, and that if they can get away with convincing the uninformed that the 650 quarter-"squat" in the video is really a squat, or that the 500 "bench press" is really a bench press, they look more effective as coaches. Especially to the sport coach you work for, if you have a plausible, jargon-dependent, very technical explanation for why your athletes are doing half of the effective ROM with more weight than they can actually use correctly, and why all that help with the weight is necessary.

So, partials are merely padded data. A lie, and a dangerous one. There's no excuse for it, yet it's common anyway. Inflated numbers should be a source of embarrassment for a college S&C program, not pride.

3, 2, 1... Go?

How long does it really take to get an athlete "in shape," conditioned to the level necessary for performance on the field? Not long. Let me ask you a question: how long did it take you to get in shape during two-a-days, back in high school? Less than two weeks, right? Two-a-days worked pretty well because conditioning is a very short term adaptation – it comes on very quickly, and it goes away very quickly.

The things that cause a conditioning adaptation at the cellular and physiological level do so very quickly, and have a short lifespan. They do not require structural/architectural adaptations, like the growth of new contractile muscle protein does, or like the process of becoming an elite marathon competitor.

Strength accumulates because muscles grow. Conditioning does not accumulate beyond a certain rapidly-achieved point, unless you become an endurance specialist. Some sports require this, most do not.

What's The Point?

Anaerobic endurance, like most team sports employ and the kind of thing team conditioning work develops, is an almost pointless activity after a short period of time. Once it is established, and for every field position regardless of the precise demands of the conditioning requirement for that position, field practice and performance maintains it quite effectively.

Lineman, forward, or goalie, if you're practicing the sport and performing the sport in competition, you're not only "in shape" for the sport, you're using the precise skills you need to develop under exactly the metabolic conditions they'll be used.

This process can be efficiently accelerated for a week or two at the beginning of the season for unconditioned, lazy athletes who show up out of shape, because conditioning comes on fast. And it doesn't go away as long as you keep doing it.

After that, it's pretty much just grandstanding. Sprints, sleds, calisthenics, and trendy CrossFit couplets are easy to coach, stopwatches and whistles look awfully coach-like, and your already-talented athletes derive no skill improvement from what is necessarily a low-skill high-intensity work exposure – if it is high-skill, you can't display the skill component with a 190 heart rate and maximum respiration rate. And they're already in shape, because they got that way almost immediately.

The Sun Dance

Making them puke, dunking their tired little heads in ice buckets and then making them sprint, beating them with coat hangers, or hanging them from hooks through their pecs to watch the passage of the sun may satisfy some primitive coaching urges, but it contains no mechanism for the improvement of field performance for already talented athletes.

And attempting to drive a conditioning adaptation beyond what is necessary on the field, for the purpose of building excellence in performance, reveals a poor analysis of what comprises excellent performance.

Furthermore, all that anaerobic shit has to be recovered from, and this doesn't always happen. The eat/sleep/recover process is quite often overloaded by a poorly-designed conditioning program whose purpose is primarily to satisfy the coaching staff's cheerleading needs, not those of the athlete. If the kids are so tired and unrecovered that they can't play effectively and they can't get stronger, then a truly useless activity has been substituted for effective training and excellent performance.

If the kids are out of gas by the fourth quarter, you either have a strength problem or a nutrition problem which should be addressed at halftime. Mashing your athletes into a stinking mass of goo with excess conditioning will almost always make the problem worse.

Dances With Cones?

Agility training is another popular way to avoid learning how to make your athletes stronger.

Many S&C coaches are now emphasizing agility and field work as the basis of their program. Field drills used to "develop" speed and agility are the feature of many college S&C videos, and they are a major selling point many S&C coaches use to recruit players.

Agility drills are merely skill displays that depend upon the amazing athleticism already present in the athletes. D1 athletes are recruited because they can run, jump, cut, and display high levels of advanced kinesthetic ability. They are great athletes – physical geniuses – or they wouldn't be in the scholarship program at a D1 school.

Agility drills are merely displays of an already-present athleticism. An athlete may improve on the drill itself over the course of a few weeks' practice, because all of these drills are learned skills. Natural athletes learn skills quickly and replicate movements efficiently within a very short period of time, and that's why they got the scholarship.

Cone drills do not develop an athlete for his sport unless his sport is Cone Drills. There's very little transfer of skill from cone drill to the field, because the athlete already knows how to play the game – that's why he was hired. He practices during practice and performs on the field.

If the sport has an extensive off-season, agility drills can be quite useful as a substitute for field practice. Football, for example, may only be played in pads for five months of the year, and agilities can enable the strengthening player to stay sharp until the pre-season.

But agilities are never substitute for strength training – they can only supplement it as a substitute for practice and performance. Cone drills for a couple of hours each week lack the potential to improve his performance that an increase in strength has.

Agility drills allow the S&C coach to display the amazing athletic talent he has been handed by the recruiting process. Athletes look really good doing agility drills, because that's what athletes are already good at doing. And they require almost no coaching, in the sense that the coach can tell an athlete what to do to improve the use of his feet in a cone drill. They are a very effective smokescreen for the ineffective S&C coach to hide behind, if he knows how to line up the cones and yell at his athletes.

What Does Rippetoe Know, Anyway?

So, if Rippetoe's obvious arguments are so compelling, and if Rippetoe knows so much more about this than D1 and pro strength coaches, how come 1) Rippetoe doesn't have a job at a D1 school or a pro team, and 2) how come these guys still have their jobs?

I was asked this question at a very high-level military installation several years ago, after I had been brought in as a consultant for a new approach to strength training. They had been following a machine-based program provided to them by a D1 university strength coach, and seeing the deficiencies in this approach some of the guys were interested in a barbell program.

The questions were asked, and my answer to the first was, "I am self-employed, I have been since I was 25, and I intend to stay that way." My answer to the second question was, "It has to do with the differences in the people D1 university strength coaches and I train. They train the finest athletes their recruiters can find, and I train the general public."

It may seem odd that I responded this way, since their elite military unit and D1 football team have more in common than my general public does with either. But my having been in a position to train ordinary people who walked in my gym off the street and follow the process of their progress for many years, sometimes for decades, juxtaposes me with high-level coaches in an interesting way.

My people were a broad demographic assortment – young and old, men and women, a few good athletes and lots of very bad ones – whereas every D1 strength coach has some of the finest young male athletes in the world in his weight room, 18 to 22-year-old genetic freaks. I had to deal with varying levels of commitment; lots of my members quit halfway through the second month, while D1 programs have very committed scholarship athletes at their command.

The Smokescreen

So no matter how a D1 strength coach trains his people, they show up, they train hard under tight supervision, and they made progress. Fine young athletes who train hard will make progress, and it doesn't matter how they are trained.

If you take a competitive group of 18-year-old men with an above-average genetic endowment, motivate them, feed them well, and do absolutely anything physically difficult with them, then during the process of getting to be 21 years old they will improve their athletic performance. Outside the weight room, these athletes are doing lots of skill work in practice, and their practice is with a more select group than it was in high school.

This further obscures the "effectiveness" of the strength and conditioning program – higher level practice, a higher level of competition, and physical maturation are all happening at the same time. As long as the recruiting staff supplies the raw material, any D1 strength and conditioning program will appear to excel, or at least to function adequately. So will the elite special forces of any military unit, if it is screened tightly enough for admission.

Under these circumstances, a machine-based, a functional training-based, an agility drill-based, or an anything-based program will appear to generate progress for its participants. Growing young men who are fed and rested will get stronger, even on a Pilates program. Many college and pro-level S&C coaches look like they know what they're doing, when they really don't.

On the other hand, poor athletes with lousy genetics cannot hope to equal the physical accomplishments of D1 recruits and pro draft picks. Guys like me, who wanted it for themselves really badly (nobody in the history of the sport of powerlifting ever wanted to be a great lifter more than I did, and nobody tried harder to do it, even if I did it wrong, which I did – you'll have to trust me here), and guys like me who want to excel as the coach of similar people, are forced to evaluate the various methods at our disposal, pick the ones that work, and shitcan the others.

I had the time – 37 years as of 2014, for you people of the future – and although I'm not a genius, I'm smarter than my heavy Neanderthal brow ridges indicate.

Finally, The Truth According to Rippetoe

My evaluation revealed that barbell training with progressively increasing loads on the basic exercises increased strength, power, and all of the other dependent characteristics – for everybody, and for several years, if they trained consistently.

The experience of every advanced powerlifter bears out the truth of this statement, and the testimony of athletes subjected to ineffective machine-based, functional training-based programs documents the time wasted on less effective programs.

If your criteria for an effective way to manage the strength program include running everybody through the workout in under 30 minutes, making everybody vomit instead of making everybody stronger, screaming and yelling instead of coaching technique with precision and effectiveness, and substituting conditioning and agilities for progressive improvement in basic strength and power, I'd suggest a rethink.

I understand that there are other factors at play, such as sponsorship money, the expectations of the alumni, and head coach/AD misinformation, pigheadedness, and stupidity. But this is 2014, your athletes have read this article, and now they know better.

I'll shut the fuck up now.

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