

the **CrossFit**[®]

JOURNAL ARTICLES

Specifically Speaking

Lon Kilgore

Every single kind of exercise researcher and practitioner known to mankind has been indoctrinated with the concept of specificity of training. The idea is so well entrenched in the professional psyche that it even has an acronym, the S.A.I.D. principle—Specific Adaptation to Imposed Demand. In a lot of ways, it's pretty correct physiologically. We all remember Dr. Hans Selye and his General Adaptation Syndrome model, which explains how the body becomes stronger and fitter by adapting in response to physical stress. The S.A.I.D. principle fits nicely into that model. Training anaerobic exercise at the very edge of one's physical limits causes the body to adapt in a way that pushes out that boundary and increases the body's capacity for that kind of work. We believe this and we use this concept in exercise programming. Specificity does work.

Let's go a little further in our consideration of specificity though. Lots of coaches and trainers want to make their programs as specific to a trainee's sport or task as possible. To some extent, this is a physiologically sound idea. We wouldn't approach training a 100-meter sprinter the same way we would approach training a marathoner, since one relies on muscle contractile speed and stored and rapidly recycled adenosine triphosphate (ATP) and creatine phosphate for performance while the other relies on several metabolic pathways, carbohydrate availability, and cardiorespiratory efficiency. The training for a certain activity must place the same types of physiologic and metabolic demands on the trainee. That principle applies to strength training for performance enhancement as well. We use multi-joint and balance-requiring exercises instead of a collection of leg extensions, leg curls, and other machine-tracked

single-joint exercises because sporting systems starts with the ground and require the body to act in a plane(s) of motion dictated by the activity, not by a machine. In this sense, a certain amount of specificity of exercise mode is also a good idea.

But specificity gets carried too far on more occasions than I can enumerate and taken to the point of being wrong. This happens particularly often in the range of exercises that particular athletes train. Some typical approaches to training for Olympic lifting and competitive cycling provide clear examples of what I mean.

If you were to go to many Olympic lifting gyms and ask the athletes there to list their exercise menu, you'd probably be surprised—or maybe not—at the narrowness of the exercises included. Snatch, snatch pull, clean, clean pull, Romanian deadlift (RDL), jerk, push jerk, Olympic (high-bar) back squat, and front squat. In extreme cases, you'll even find those who only snatch, clean, jerk, and Olympic squat. A very narrow but physically similar—thus specific—exercise selection. Progress is possible this way with beginners and, to some extent, with intermediates, since the overload possibilities offered by the partial movements (pulls, RDLs, and squats) will produce some progress. But with advanced lifters, those who focus on high-performance weightlifting competition, such finite specificity may limit progress. A standard deadlift is more of a strength stimulus than an RDL or a pull. Rising from a snatch or from a clean is more closely mimicked by the Olympic and front squats. However, the less-specific low-bar squat more efficiently develops the hips than the other two variants by anatomic function and by virtue of being

1 of 4

Specifically Speaking (continued...)

able to handle more weight throughout the complete range of motion. A low-bar squat loads the hips and legs more evenly (anterior-posterior) than the quadriceps-dominant high-bar Olympic or front squats. The heavier weights possible with this exercise provide a better overload stimulus than an Olympic squat. The hips help the weightlifter stand up and help with the pull. More hip strength equates to better performance.

Evidence that low-bar squatting can be effective in developing a weightlifter can be seen in the fact that a number of accomplished powerlifters who were at the national and world level made rapid transitions to the elite levels of weightlifting with little, if any, specific high-bar squat work. America's best superheavyweight of recent times, Shane Hamman, was a 1008-pound low-bar squatter immediately prior to his conversion from powerlifting to the Olympic sport. There are numerous examples of this same phenomenon occurring on a smaller scale in my area of Texas where high school champion powerlifters make national junior weightlifting teams in a matter of months

after first beginning to train the Olympic lifts. The relative ease with which powerlifters can be converted to high-level weightlifters indicates that strength is more specific to weightlifting performance than squat style is, and the most efficient means of developing that strength is always best for weightlifters. At some point, training exactly the performance activity or a very close variant is too specific and will fail to be satisfactorily disruptive of homeostasis and fail to drive adaptation. In this context, too much specificity—or the wrong kind—will limit fitness gain and is wrong. For weightlifters, strength training specifically to get strong is more beneficial than strength training that tries to mimic their sport's movements more specifically.

Another example of specificity gone awry can be found in the sport of cycling. Cyclists just love to ride bikes, and I am always surprised by the passion of even the most ordinary recreational racer. I am also surprised at the exercise prescriptions that cycling coaches, even the elite ones, provide to develop their athletes' fitness and performance. You want to improve endurance?

Ride a bike, they say. You want to get fast? Ride a bike. You want to get strong? Ride a bike. But can one activity really provide such a breadth of results? Why is the prescription for performance enhancement on a bike almost always “ride a bike more”? A huge number of trainees and coaches believe that improving on-the-bike endurance, strength, or speed is best developed by specifically riding longer, riding harder, or pedaling faster. (Remarkably, I have even been told that two hours of long, slow distance [LSD] riding will improve cycling speed performance.) OK, if you are a beginner, this approach will work, for a period of time. But if you have been riding and racing for a while, you have to alter the stress to elicit further adaptation from the body.

Endurance comes with more hours in the saddle? No. Just spending more hours pedaling away at a constant pace will fail to disrupt oxygen homeostasis and cannot drive further cardiovascular adaptation. Strength comes from pedaling a big chain ring and a little rear cog? No. At some point the physics of the chain ring size or the incline grade needed to tax strength

will render the activity untenable. Speed comes with trying to pedal a little chain ring as fast as possible? No. Spinning the pedals as fast as you can will eventually reach its absolute and will be limited in its ability to stimulate neural adaptation. And don't even get me started on the mutant logic used to argue that LSD improves speed. So it appears that riding only a bike to specifically train for cycling performance in anyone other than a beginner fails the litmus test of specificity. The activity is so specific that overload is not possible. And without overload, there cannot be any adaptation in fitness or performance, so specificity in this context is a wrong approach as well. CrossFit-style broad, functional training could really help these athletes with their physical preparation.

Here is where things get a little difficult. How does specificity play into the CrossFit model of varied training? Well let's ask ourselves what CrossFit is specific to? Hard question, isn't it, since its explicit aim is broad, inclusive general physical preparedness based on intentional variety? So many diverse groups use the

At some point, training exactly the performance activity or a very close variant is too specific and will fail to satisfactorily disrupt homeostasis and fail to drive adaptation.



Eva Twardokens

program successfully that you really can't pick a single specific best fit. It is tempting to say that every fitness seeker, every worker, every athlete—heck, every human—can reach their goals through CrossFit. The results of CrossFitters everywhere point to exemplary strength, endurance, mobility, and health. But we can't claim that CrossFit replaces sport-specific training. At the advanced and elite levels, most sports require extended periods of very narrowly focused training, a focus and specificity that by necessity excludes CrossFit training and its emphasis on breadth and variety.

Let's look at the [Basic Strength Standards](#) that Mark Rippetoe and I developed to illustrate the point. In order to move forward as quickly as possible in developing pure strength, any advanced or elite trainee would need to spend a majority, if not all, of their training time on strength training. This does not mean that a CrossFitter cannot reach maximal strength potential using CrossFit methods. After all, strength is one of the basic fitness elements. But, because CrossFit training is multifocal, not singular, it will take longer to get to that peak strength performance level. The amazing Eva

Twardokens is an excellent example of what can be achieved with consistent long-term CrossFit training. She got very strong on CrossFit (as attested to by her performance in numerous demo videos on CrossFit.com over the years). She was strong enough that it was observed that she would do well in competitive weightlifting with her CrossFit-derived strength and skill. But Eva is a fierce competitor, and merely doing well was not an option; she would want to win. So she spent a few months training just the Olympic lifts in order to develop the specific strength and technique needed to win, not just place or show. And the result of that specific training was rapid improvement. Her 2007 U.S. National Masters Championship winning lifts rank her as either the best or second-best masters woman 63-kg lifter in the world in the past five years. This is a very good result for a few months of specific training. Solid broad-based functional fitness—true general physical preparedness—provides an unmatched base on which to build sport-specific mastery.

Critics of broad fitness training for specialized athletes might try to use this same anecdote to argue, on the other side of the coin, that it demonstrates a failure to improve a single specific component of fitness as fast as physiologically possible. But I think not. We all know that specificity has its costs. When focusing on just one aspect, broad-spectrum ability will suffer. If we train only for LSD, strength, power, and agility will diminish. If we train only for strength, the endurance and mobility aspects of fitness will decay. (For example, Eva's ability to reproduce her performances at the full range of CrossFit workouts suffered during her period of specific training for weightlifting.) So it is not a question of whether a specific or multifocal training approach is better; it is a question of goals and the timing of those goals. Traditionally, athletes tend to choose one thing to do well at, a sport in which to specialize. I was one of those narrowly focused competitors and coaches, and I still struggle with pushing outside the narrow comfort of my life playing with the iron. I like being strong and I like strong people. But maybe I'm getting old, or maybe working on understanding the CrossFit performance puzzle has changed me, but these days I see that we all have a lifetime in which to achieve great things and one of the greatest things is to be fit. What impresses me about Eva is not how strong she is; it's how insanely fit she is and the sheer diversity of physical tasks and activities that her training has prepared her to be able to do very very well.

Specifically Speaking (continued...)

CrossFitters are on a quest to be fit. Some also have more specific goals they want to achieve, and many CrossFit trainers work with clients who have competitive sporting goals. Questions on how to integrate CrossFit training into sport- or goal-specific training are common. This is a difficult topic with many divergent opinions. When the question is posed to me, I try to give the best answer I can given the circumstances of each individual who asks. There are instances where the rate of improvement for a specific component of fitness needs to be faster than CrossFit programming “as written” will provide. Detractors sometimes seize those exceptions as an argument against CrossFit’s applicability to sport. I think the better response is simply that CrossFit is specific to broad physical fitness—to development of far-reaching, usable strength, power, endurance, mobility, and health. It is the best way to train for any sport, job, or goal that requires comprehensive fitness and general physical preparedness. It is also perfect for any coach who wants to rapidly establish an athlete’s fitness base before adding in or moving on to specific sport training. Karoliina Lundahl, a two-time world weightlifting champion from Finland, once told me that her success in lifting stemmed from her coach’s development of the athlete in her first, before he made her a competitor. His establishment of a physical fitness base early in her career allowed her to later work harder in her sport-specific work and led to her to the pinnacle of sporting success. Hers was a thinking coach who used the right tool at the right time to achieve his trainee’s specific goals ... and we can all do that.



*Too much specificity—
or the wrong kind—
will limit fitness gain.*

Lon Kilgore, Ph.D., is professor of kinesiology at Midwestern State University, where he teaches exercise physiology and anatomy. He has extensive experience as a weightlifter himself, and he has worked as coach and sports science consultant with athletes from rank novices to collegiate athletes, professionals, and Olympians. In addition to publishing articles in numerous scholarly journals, he is co-author, with Mark Rippetoe, of the books *Starting Strength: Basic Barbell Training* and *Practical Programming for Strength Training*.