



Team BFS weightlifter Maegan Snodgrass used a Bulgarian periodization model prior to breaking the School Age American record in the snatch. Maegan hopes to compete in the 2009 National Championships.

The Truth about *Periodization*

Why much of what you think you know about this important training concept is just wrong

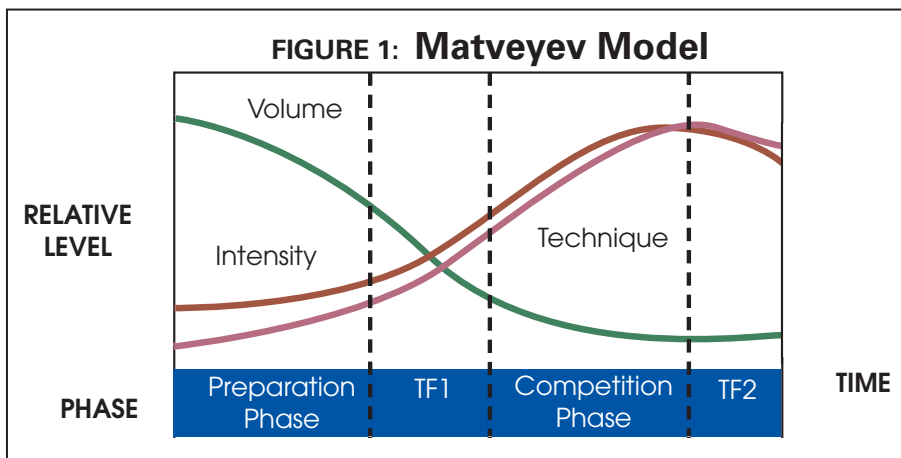
BY **KIM GOSS**

Periodization is a method of manipulating the variables of athletes' training so they can perform their best at the appropriate time. Done right, it's a tried-and-true approach, but many elite strength coaches and organizations in the field

of strength and conditioning are clueless about where the idea came from and how to use it most effectively. As a strength coach who has been studying and implementing periodization programs for over three decades, I'd like to remedy that by clearing up some

misconceptions about its origin and its application to athletes.

Many authors introduce the concept of periodization by describing what is often referred to as the "classic model" of periodization proposed by Russian sport scientist Leonid



In 1964 Russian sport scientist Leonid Matveyev introduced a model of periodization that progresses from a high volume/low intensity workouts to low volume/high intensity workouts.

Matveyev. As illustrated in Figure 1, this model suggests that training should progress from a large volume of work at a relatively low intensity to a low amount of work at a high intensity.

In terms of strength training, *volume* is related to the total number of reps and sets, and *intensity* is related to how much weight is lifted in relation to an athlete's maximum performance for one repetition (1RM). Thus three sets of 10 repetitions is a higher volume of training than three sets of five reps, and a set of five reps is not as intense as a set of four reps.

Dr. Mike Stone and his colleagues Dr. Harold O'Bryant and Dr. John Garhammer described how to apply Matveyev's periodization model to strength training in a 1981 paper, "A Hypothetical Model for Strength Training."

This type of program consists of four phases (Figure 2), with each phase lasting three to four weeks, although the maintenance phase could last the entire length of a competitive sport season.

I personally know all three of these brilliant scientists, and each has contributed much to my career as a strength coach. That being said, I believe that the major impact of this paper was to show that a variety of set-rep protocols was more effective than a single set-rep system such as 3x10 or 5x5. Further, the first year I was a coach for the Air Force Academy (1987), I tried implementing the workout with the Falcons football team.

The 1981 model was taken a step further in the National Strength and Conditioning Association's textbook *Essentials of Strength Training and Conditioning*. In the chapter on periodization, a 17-week program was presented that gradually shifted from high reps to low reps, as follows:

- Weeks 1-6: 3-5 sets of 8-12 reps
- Weeks 7-11: 5-6 reps
- Weeks 12-16: sets of 3-5 reps and 2-4 reps
- Week 17: 1-2 reps

In recent years, the trend among many strength coaches has been to use

a system called *nonlinear periodization*, in which the repetitions vary every workout. In a book on the subject, *Optimizing Strength Training* by Steve Fleck and William Kraemer, the authors present a 16-week program that uses this six-week rotation of repetitions: Monday, 12-15; Wednesday, 8-10; Friday, 4-6; Monday, 1-3; Wednesday, "Power Day" (i.e., very low reps); and Friday, 12-15. Thus, on Monday you may perform 10 reps, Wednesday 5 reps, and Friday 1-3 reps.

The above paragraphs represent the essence of what is often taught as the history of periodization. Now let me share with you an alternative history.

Periodization: Another View

It's unlikely that many of the researchers who are citing and promoting Matveyev's model have read his actual textbooks, because Matveyev



Critics of the Matveyev periodization model include the late Dr. Mel Siff (left) and Dr. Yuri Verkhoshansky.

himself has pointed out the drawbacks of this model in his own writings. Further, Matveyev's colleague Dr. Yuri Verkhoshansky, and also the respected sport scientist Dr. Mel C. Siff,

have said that it is a mistake to continually cite Matveyev's model in isolation, as often occurs in papers published in the *NSCA Journal*. They say that the 1964 model is not a true reflection of this pioneering sport scientist's body of work, and they suggest that there are only a few models of periodization.

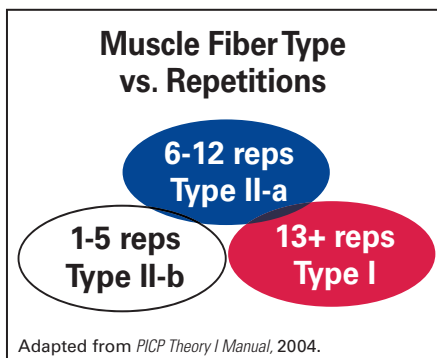
Periodization models can vary greatly, with such names as *pendulum approach*, *wave loading*, *asymmetric pyramid loading*, and *step loading*. It so

FIGURE 2

PHASE	HYPERTROPHY	BASIC STRENGTH	STRENGTH AND POWER	PEAKING OR MAINTENANCE
REPS	6-12	≤ 6	1-5	1-3
INTENSITY	67-85%	≥ 85%	75-90%	Vary high to low
SETS	3-5	3-5	3-5	1-3
VOLUME	High	Moderate to high	Moderate to low	Low to very low

happens that the model that Matveyev promoted is inappropriate for most athletes. Why? One reason is that if you're performing a large volume of work, you will create a high level of fatigue that would interfere with your ability to learn or perfect proper technique of your primary sport. Try working on speed while squatting five sets of 10 reps, three times a week for three weeks. Not only would you place yourself at a high risk of a hamstring pull, but the fatigue generated from those squats will not enable you to sprint very fast.

Physiologically speaking, periodization programs such as the one presented in the NSCA textbook don't make sense in regard to developing functional hypertrophy. That is, much of your workout will not develop the muscle fibers that will help you perform in your sport. For example, performing sets of 12-15 reps will generally develop the slower, Type I, muscle fibers; sets of 1-5 reps



To work the muscle fibers that contribute most to sports requiring great speed and power, athletes should primarily perform sets of 1-5 repetitions.

will develop the faster, Type II, muscle fibers. And the idea that Type I fibers can be “converted” into Type II fibers is simply not possible. Performing a few sets of higher reps as part of your training is fine as a break from lower reps, or when training those with little training experience, but this approach primarily develops muscle fibers that contribute little to making athletes faster or more powerful. If it did have that effect, then

bodybuilders would be a lot stronger than they are.

Periodization programs that have phases of 3-4 reps are monotonous (three to four weeks of 5x10 in the back squat – ouch!) and can lead to burnout – I saw this firsthand trying that four-week periodization model at the Air Force Academy. Further, at the high school level, multi-sport athletes are almost always in-season, and having maintenance phases would not enable an athlete to make significant gains in strength.

BFS has been around for 32 years, and we know from talking to high school coaches that young athletes do better when they can see progress frequently – it's tough to motivate these athletes to wait 12 weeks before they can hit a max squat, bench or power clean. As for nonlinear periodization, the change in repetitions is too rapid and the body becomes confused as to which type of stimulus it is trying to adapt to. Nonlinear periodization may be better than the so-called classic model of periodization, but not by much!

Practical Periodization

One of the most effective methods of periodization is the one promoted by Charles Poliquin, which I understand is based in large part upon the work of German sport scientist Dietmar Schmidtbleicher. Their model alternates between periods of higher volume (accumulation) and higher intensity (intensification). The higher reps are a recovery phase that keeps the muscle mass high (what is often called functional hypertrophy). Here is an example:

- Weeks 1-2: 5 reps
- Weeks 3-4: 3 reps
- Weeks 5-6: 4 reps
- Weeks 7-8: 1-2 reps

Performing extended periods of high-intensity (i.e., low-rep) work tends to exhaust the nervous system and

contribute to overtraining. By alternating between periods of higher reps and lower reps, while making sure to stay in the repetition bracket (1-5) that develops the fast-twitch fibers, the athlete can work harder with less risk of overtraining.

With the weightlifters I train, I use a similar periodization model based upon four-week cycles. It's based upon a program I learned from Bulgarian weightlifting coach Angel Spassov when he visited me at the Air Force Academy. It was a program I used with weightlifter Maegan Snodgrass prior to her breaking the School Age American Record in the snatch in 2006. Essentially, the program looks like this:

- Week 1: Introduction (low volume, low intensity)
- Week 2: Basic (high volume, medium intensity)
- Week 3: Intensity (low volume, high intensity)
- Week 4: Peaking (low volume sessions followed by a test day at the end of the week)

Using this year-round, you have 12 peaks in which you can regularly determine the effectiveness of the workout and make changes accordingly. If the results are lower than expected, for example, then the coach may increase or decrease the total number of sets performed during a specific week. Also, such an approach to training keeps athletes “competition sharp,” as they are essentially preparing for a competition (or test day) at the end of each month.

A somewhat similar approach is used in the BFS program:

- Week 1: 3x3 (high intensity, low volume)
- Week 2: 5x5 (medium intensity, medium volume)
- Week 3: 5-4-3-2-1 (high intensity/peaking)
- Week 4: 10-8-6 or 4-4-2 for clean and deadlift (low intensity, medium volume)

As you can see, the BFS periodization model has many qualities associated with other effective models, as follows:



Reg Bradford photo

Charles Poliquin, shown here training former NFL lineman Ethan Brooks, found greater success in following periodization programs that varied the repetitions every one to two weeks.

- Frequent variation
- Optimal repetition bracket to work the appropriate muscle fibers
- Avoidance of excessive high-volume periods that can interfere with sport training
- Test weekly to measure progress, plus 1RM lifts on the third week
- A recovery week after the highest-intensity week

One question frequently asked about the BFS program is why the 5x5 week is not performed first. Two reasons. From a physiological standpoint, performing the 3x3 week would create excessive fatigue going into the 5-4-3-2-1 week, which would reduce the amount of weight that could be lifted (a principle called *accumulative fatigue*). From a psychological standpoint, going into the 5x5 week the athletes will believe that they will be able to perform at least three reps, because they performed them the previous week – certainly they can do at least one more rep for a personal record! If the athletes did the 5x5 first, they would have to use a weight that they have never used before – they may even doubt that they could perform a single rep!

To prevent creating excessive fatigue that can adversely affect skill training or game-day performance, during the season athletes only lift twice a week. Certainly there are more sophisticated models of periodization, and with exceptional athletes these may be more appropriate to use if a coach thoroughly understands the models and has the time and staff to implement them. However, for the majority of athletes, the BFS program can produce exceptional results – plus it's easy to implement.

Although it's important to look at research studies and position papers and see how this information can be applied

to your program, consider that there is a lot to be said for practical experience. For the past 32 years hundreds of thousands of athletes have made exceptional progress on the BFS program, and the popularity of our method of periodization is such that we now give over 400 clinics a year. The BFS program is not new, nor is it extremely complex, but it is a proven system that has not changed for over three decades. As they say, "If it ain't broke – don't fix it!"

While some coaches will continue to promote what we at BFS consider a classically *wrong* approach to periodization, we'll continue getting it right and doing it well. BFS

There is a good reason why the BFS periodization program has not changed for 32 years...IT WORKS!

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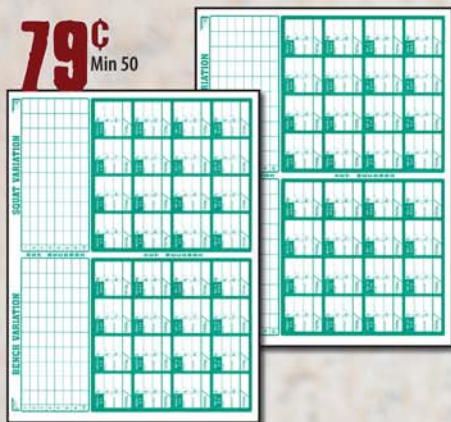
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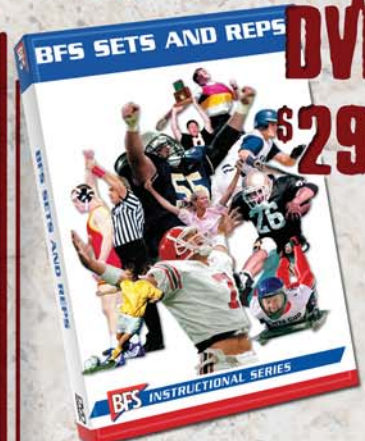
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