

I do realize that this may draw some fire from some strength and conditioning coaches out there. I do not bring this point about to try and change the way things are done. I do not want anyone to “throw the baby out with the bath water” so to speak. I am just trying to present something that many people have not heard of, and give more ammo to one’s strength and conditioning arsenal. That being stated, on to the meat and potatoes of this article.

Linear periodization has long been the standard in the western methods of training for Strength and Conditioning Coaches. For example starting out at 70-75% and moving up a set percentage every week until they achieve a new maximum. Linear periodizaion has proven to be effective at many levels and is a great system for strength coaches and performance specialists everywhere. The goal of periodization is based upon the work of Hans Selye. Selye demonstrated that a system could adapt to nearly any stressor that is introduced to them (provided they are not already faced with exhaustion). This is similar to the new construction worker who after the first day has blisters when he goes home. After a few weeks of work, his body adjusts to the new work and he no longer gets blisters because he has formed a callous. Linear Periodization accomplishes this by using gradually increasing loads over the course of time, which is also known as the progressive overload principle (Baechle). The organism keeps being presented with greater loads each week and achieves an increase in strength to meet the demands of the body. This adaptation is also known as the SAID principle (Baechle) or Specific Adaptation to Imposed Demands. These two principles are the backbone of Linear Periodization.

On the other hand, Linear Periodization does not take into account for several things other than the program. Things such as outside stressors, ability to handle stress, and the individual athletes ability to recuperate from training. Outside stressors greatly affect the body, drawing on the same current adaptive reserves (Siff) that training draws upon. From Selye's book, "The Stress of Life" (Selye) it has been demonstrated that all stress has the same effect on the body in terms of the stress syndrome, so they all draw upon those current adaptive reserves. So an athlete who is working construction will not have the same ability to recover from training as one who is just taking class. An athlete who just lost their significant other will not have the same ability to recover that an athlete in a happy relationship will have. Things such as relationships, work, school, sleep, nutrition, all effect how the athlete can recover. If an athlete just broke up with their significant other the previous night and comes into a squat workout of 4x5 @ 82%, that 82% may not actually be 82% of the athletes ability that day. It may be closer to or more than 100%.

There are several other methods of organizing training, and one of them is Autoregulatory training. Several strength coaches at the collegiate and professional level believe this will become the next wave. There are several factors to deal with beyond simply percentages when training athletes. Every athlete is different, and will handle the stresses of training and life differently. By giving all of the athletes one program and everyone deals with the same percents, the athlete is not able to progress at their individual best rate. Autoregulatory training allows the athlete to perform as best as they can on that day and progress at their own individual rate.

Many strength coaches have noted that sometimes athletes “just don’t have it” and their workouts suffer. They struggle with the weights that are listed for them on that given day. The athlete often times has either achieved a point of staleness or has just drained his mechanical or neurological energy for the day. The athlete may have entered the 3rd stage of the stress syndrome. Or it could also be that they didn’t sleep the night before. While not actually at the exhaustive point to bring about overtraining, they do not have the energy to train at their absolute 1RM. There are many ways to monitor the athletes training status, but that is another article in itself.

While there are several methods to Autoregulation of training, the one that will be discussed here is the Autoregulatory Progressive Resistance Exercise protocol first presented by Delorme, and has since been modified. The model that will be discussed today is the one that was developed in 1979 (Knight). It maintains the same form and spirit as the original, but increases the volume of the working sets, and decreases the volume of the sets building up to the working sets.

The ability to train at a maximal level on an individual basis on any given day will allow one to make greater strength gains. It has been stated in the literature again and again. Intensities of 90% and above recruits the greatest number of motor units, and the more motor units that are recruited and trained, the more that can be called upon on any given day (McArdle). We all want our athletes to get as strong as possible, so we will try and use the highest percentage to activate the most motor units, and not only receive an increase mechanically in force production, but one neurologically as well by increasing the number of motor units called upon at any given time. This double headed axe transfers greatly to athletics.

Another one of the benefits is that training to failure, as done in the APRE, or to the limit (also called to the utmost) as it is called in the soviet literature, causes a greater advancement of the neurological system. The endings of motor nerves will grow and become wider and the number of terminal branches and nuclei of schwann's sheathe multiply as the muscle fiber gets hypertrophied. Increased contact surface between nerves and muscles get larger, functional condition of the neuromuscular systems get better, making easier the conveying of the neurological commands to the muscles (Ajan).

Many strength coaches have found, citing soviet research that the body adapts to repetitions first. With the APRE the repetitions can vary with every working set every week. The body is never allowed to adapt to the reps so the stimulus is constantly fresh.

The Autoregulatory protocol used for this article was the Autoregulatory Progressive Resistance Exercise (APRE) discussed in Supertraining and noted in Chart 1. For the 6RM protocol, there is a warm up followed by a set of 10 at 50% 6RM. Set two is 6 reps at 75% 6RM. Set three is a set of maximal reps at 100% 6RM. Set three determines the weight used for set four by the use of the adjustment chart listed in chart 1. The weight and repetitions performed in set four determines the 6RM for next week. The ideal situation is to where one can achieve 6 reps, but not 7 for both set 3 and set 4. If they can do more reps then the weight is too light. If they can not achieve 6 reps, then the weight is too heavy.

This may sound very complex, but once one implements it a few times it becomes very simple. For example, athlete A comes into a workout with a 300lb 6RM, their first said would be 10 reps at 150lbs. Set two would consist of 6 reps at 225 lbs. Set three would be reps to failure at the 6RM. The athlete was feeling good and achieved 13 reps

on set 3. For set four, the athlete would add 15lbs to the bar for a weight of 315lbs. The athlete again achieved 13 reps because the weight was still too light. For the following week, the athlete will use a 6RM of 330lbs because of the adjustments necessary from the chart.

APRE (Autoregulating Progressive Resistance Exercise)			
Set	3 RM Routine	6 RM Routine	10 RM Routine
0	Warmup	Warmup	Warmup
1	6 reps@ 50% 3RM	10 reps@ 50% 6RM	12 Reps@ 50% 10RM
2	3 reps@ 75% 3RM	6 reps@ 75% 6RM	10 reps@ 75% 10RM
3	Reps to Failure@ 3RM	Reps to failure@ 6RM	Reps to failure@ 10RM
4	Adjusted reps to failure	Adjusted reps to failure	Adjusted reps to Failure

Adjustment Table for APRE					
3 RM Routine		6 RM Routine		10 RM Routine	
Repetitions	Set 4	Repetitions	Set 4	Repetitions	Set 4
1-2	Decrease 5 - 10	0-2	Decrease 5-10	4-6	Decrease 5-10
3-4	Same	3-4	Decrease 0-5	7-8	Decrease 0-5
5-6	Increase +5-10	5-7	Same	9-11	Same
7+	Increase +10-15	8-12	Increase 5-10	12-16	Increase 5-10
		13+	Increase 10-15	17+	Increase 10-15

From this previous example, one can see how the variance could occur in strength acquisition between different athletes. Athlete A may increase 30 lbs for Set 3 the next week from the Set 3 of the current week, while Athlete B may have decreased 5 lbs for the next week from Set 3 of the current week.

The beauty of this style of organization of training, is that it in itself accounts for the outside stressors. For instance, an athlete who is on full scholarship may only have to take one class during the summer to be able to get their scholarship check, which would allow a greater amount of time to focus on training and recuperative means. An athlete who is a walk-on who must work construction all summer to earn enough money to live on throughout the entire year will not have the same amount of time to train, energy to train, or ability to utilize recuperative means as the scholarship athlete. However, since

they are both allowed to progress at their own rate, the scholarship athlete will achieve strength at a greater rate and not be forced to train with lighter weights because of the percentage. On the same note, the walk-on will achieve the greatest possible results and possibly prevent overtraining because they are what regulates the work load.

This is a prime instance of when 80% is no longer 80% with the athlete who was working construction. The assigned percentage from linear periodization was invalid due to the outside stressors, it may have actually exceeded 100% for the athletes ability on that given day.

Published research does not currently exist for the APRE, as it is hard to get a sample size large enough to have statistical power. Research is currently being done, and many believe that this will be a next great wave of training. This article was written preemptively to this research to simply extend the knowledge before the research hits the journals. There is no sense in keeping information silent.

Now it is time to step out of author mode and into coach mode. I do understand that many people will be skeptical about a new type of organization or programming, and rightly so. There are a few things to remember whenever programs are written, a well coached program will beat a well written program every time. My first boss Rick Perry told me this, as it was told to him by his former boss Fred Roll.

When it comes down to the end of the day, it is your job on the line. You must go with what you know, and what you feel the most comfortable with. I am not the one who worries about the axe over anyone else's neck but my own. Go with what you know, teach it to the athletes, and if you truly believe in it, it will show to your athletes. The

athlete only cares if the program is the best possible one for them. If you believe this is so, they will as well.

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