5 keys for explosive power development

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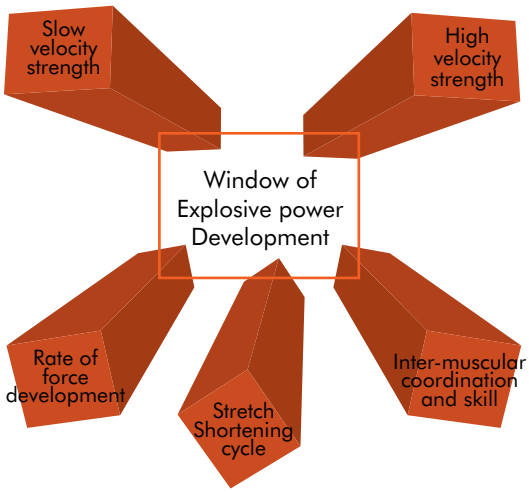
Why do the same exercise routines cause greater or smaller effects in different athletes? Why is it that if an athlete were to copy a training routine of a famous athlete it will not create the same result for him/her as what it did for that famous athlete?
The secret is that one should only use the general underlying ideas of these programmes and employ it in the correct manner for a specific athlete because not all athletes have the same physical development of the components below and this is also one of the reasons it is ideal to train various components throughout the training year as explained in the Window of explosive power development.



Adapted from Mcardle, Katch & Katch. Fig 22.17, p 526

The figure above lists 5 components needed for development of power, if you should go and look at each component of an athlete you can determine what kind of training will give the biggest response related to power development. What this basically means is if your athletes weakest component is slow velocity strength you will get the biggest improvement by focusing on this component. To better understand each component I am going to give examples of exercises that fits each component.

1. Slow velocity strength = Very Heavy Squats
2. High velocity strength = Snatch (pulling the bar from the floor at high speed to a overhead position)
3. Rate of force development = Speed squats (Doing a squat at 50%-60% of your MAX as fast as possible)
4. Stretch shortening cycle = Jumping
5. Inter and Intra-muscular co-ordination skill = This done during the teaching of techniques of lifts like doing drills of the exercises and focussing on getting the neuromuscular system to activate more muscle groups and muscle fibres to activate.

The window of opportunity gets bigger the weaker the component is that you are working on and the window gets smaller the more developed the component is. The reason for this is that if you are already well conditioned in slow velocity strength you will be close to your peak in that component and only a little improvement will occur in your overall performance. The 5 components will also differ from one person to another because of their genetic make up, level of conditioning, previous training programs and the sport they compete in.
This is the reason why all the components should be trained all around the season for athletes requiring explosive power in their sport. Explosive power is developed optimally by training all 5 components and if 1 of these 5 de-trains it will have a detrimental effect to the athletes explosive power development. In other words if you become significantly weaker in slow velocity strength it may cause you to have a decrease in explosive power.

One training modality addresses almost all 5 of these components and that is Weightlifting or Olympic lifts.
To appreciate the powerful effect you can achieve with Olympic style weight lifting exercises, one first has to understand how the body works when creating a specific movement. The answer to this is very simple in that most sporting activities require the body to move as a unit combining a multitude of different movements in one action. For example standing up from a chair requires hip extension, back extension, knee extension, ankle flexion

and extension and if you are pushing up with your arms together with your legs also elbow extension, wrist flexion and extension, shoulder flexion and humeral adduction. In order for you to stand up from a chair, all of these actions have to occur in a specific sequence; thus muscles have to contract in a specific sequence in order for you to stand up. If a specific part does not occur or occurs in the wrong sequence you will either not be able to stand or stand up in a very inefficient way. So if you look at movement in this manner you can understand that sport movements can be a bit more complex than standing up from a chair.
Just looking at the mechanics of human movement one has to structure and choose exercises that will strengthen the mechanics for the sports that you are preparing for. The best way to achieve this is obviously to practice the sport itself. But doing that will only push your performance up that much and to get an even bigger improvement in your performance and injury resistance you have to condition your body with an overload for it to adapt and progressively increase balance, strength, power, endurance, speed and agility thus increasing performance.

What I am coming to with all of this, is to show you that Olympic style lifts can be used as part of a strength and conditioning programme, and for you to see the different mechanics involved in these lifts, and how it teaches the athletes body to sequentially act and perform as a unit. Weightlifting is total body exercises and are performed in an explosive way, thus technique is of utmost importance. Except in very rare instances are these lifts contra indicated for anyone engaged in resistance training and they have lower risk of injury if taught correct technique that most sports.
When trying to improve an athlete's performance strength will only take him/her so far when dealing with sports that require speed, acceleration and explosiveness, at a certain level you would have to increase the athlete's rate of power production. And this can only be done by increasing power, and the most effective way of doing that is by using explosive weights lifting as part of your strength and conditioning programme.

If you take all the types of athletes in the world and put them against each other in a 30m dash what athletes will do the best? The answer is quite a surprise for most people… and the winners would be Olympic weight lifters followed by the throwers in athletics. These athletes also achieved the highest vertical jump test heights as well. The reason for this because of the explosive nature of their exercises and events seeing as a big part of these lifts are basically a vertical jump with a huge load hanging on a bar your holding. And because the nature of their lifts they train all 5 of the components all the time.

With this in mind you can also do jumping and slow velocity exercises to complement power together with weightlifting.

Remember that when it comes to improving physical performance it works on a use it or lose it model. Which means if you are not using a component in a phase most likely you are going to lose it!