How letting go or throwing a barbell with a Self-Spotting bar catch enhances the effects of Olympic lifts in power development.

This article will explore studies, and research that support the advantages of using a self-spotting bar catch mechanism in a performance training space. Most notably, the ability to optimally train power. Which is the number one priority in an athlete's training regimen to attain the highest levels of performance. Up until this point, traditional free weights and Olympic lifts have been the means of training the highest level of power. Both of which can be enhanced by integrating a self-spotting bar catch mechanism into a performance training environment. This article will touch on how the self-spotting mechanism accomplishes such end.

Limitations of Traditional Free Weights in a performance training environment.

As performance training continues to evolve, the singular goal remains the same. That is, to design a strength and conditioning program that will develop an athlete's abilities to achieve optimal performance on the field, court or course of competition. An ideal performance training program teaches the body to execute essential athletic movements at a proficient level.Doing so requires an ability to generate high levels of power. Making power development a top priority in any performance based training program. Examples of a few those movements would be:

1. Jumping
2. Sprinting
3. Swinging a bat or club
4. Leg drive
5. Get-off for a defensive lineman in football
6. Cutting
7. Reaccelerating

When you look at all these aforementioned competitive movements, they all share one common characteristic -they are purely propulsive in nature. Meaning only gravity, fatigue and physical contact, in contact sports, decelerates the implementation of such movements. There is no intentional deceleration from the athlete's part.

This is where the nature of traditional free weight training has its limits in developing power. The basic definition of power is strength x speed = power production. An important variable of that formula where traditional free weight lifting falls short is in generating enough speed, or accelerating. Although traditional weights serve an important purpose in developing foundational strength, they do not replicate the essential athletic movement skills performed in competition. That is because the bar is purposely being decelerated to finish the range of motion. Studies based off of 1-RM bench presses show that the bar decelerates for the final 24% of the range of motion. At 81% of 1-RM, the bar decelerates for the final 52% of the range of motion.(4)

The National Strength and Conditioning Association's *Basic Guidelines for the Resistance Training of Athletes* goes on to explain the reason why in traditional weightlifting the bar is intentionally being decelerated at the top of the lift. They state that “performing speed repetitions as fast as possible with light weight (e.g., 30-45% of 1-RM) in exercises in which the bar is held on to and must be decelerated at the end of the joint’s range of motion (e.g., bench press) to protect the joint."(8)

With a premium placed on training for power in a performance training environment, the over utilization of traditional free weight lifts is counterproductive. With the bar being held onto throughout the duration of the range of motion, a large portion of traditional free weight movements consists of an intentional deceleration. As long as the lifter is holding onto the bar, it doesn't matter how fast a lifter tries to move it, the result will remain the same. Which is training the body to decelerate or slow down more then teaching the body how to accelerate. Being that acceleration is an essential component of training power, traditional free weights lifts alone aren't enough in training power most effectively.

How to eliminate the effects of traditional free weightlifting in power development."Let it Go."

Understanding the nature of "traditional free weight" lifts and how it teaches the body to decelerate or slow down, also sheds light on how to eliminate those effects. Just as holding onto the bar teaches deceleration, releasing the loaded bar at the end of the range of motion teaches the body to accelerate. Simply put, throwing a barbell is what reverses the effects of traditional free weight lifts.(7)

The action of throwing or releasing the bar at the end of the range of motion replicates the nature of competitive movements. That is because through the duration of the range of motion of the ballistic movement, the lifter exerts no effort to decelerate. When the lifter combines this propulsive movement with the correct loads placed on the bar, optimal power production is achieved. The ideal load for power training was discovered in a study of bench throws where "55% of 1RM was most effective in generating maximum power output."(1) Lighter loads 0-30% of 1-RM, like throwing a light med ball, although generates high velocity, doesn't generate the required amount of force in order to train the highest power levels.(2)

Jump squats, plyometric bench throws, push press throws are examples of these movements that best mirror competitive movements for two reasons. First, they are movements that are propulsive in nature without any intentional deceleration. Two, these movements involve a barbel that allows the lifter to load the proper weight to train at just the right spot along the velocity force curve to develop optimal power.

Even so, exercises like jump squats, plyometric bench throws, push press throws etc. also have their restrictions when performed with just a loaded barbel. Why? Because requiring the athlete to catch a free falling bar like in the case of plyometric bench throws or absorbing the bar while landing after performing a jump squat leads to two undesirable outcomes. First, catching or absorbing a free falling barbell limits optimal power development. In the study "comparison of

weighted jump squat training with and without eccentric braking", demonstrates that while there are benefits to doing traditional jump squats, having something like a brake, that catches the bar for the athlete that minimizes the eccentric phase of the movement only leads to a higher output of power development. This study took a group of 20 male subjects. They were divided into two groups. A group that trained using a device that caught the bar after performing the jump squat (braking group) and a group who did not have such device (non-braking group). The study concluded that the power output was improved more in the braking group compared to the non-braking group. (5)

Secondly, catching or absorbing a free falling barbell places excess stress on the athlete's body. In the study "The effect of a braking device in reducing the ground impact forces inherit in plyometric training" shows that if you are able to avoid catching or absorbing a free falling barbell, the likelihood of injury greatly diminishes. That is because the braking mechanism significantly reduces extreme ground impact forces caused by the free falling barbel that potentially could lead to injury.(6)

This is precisely the advantage of using a self-spotting bar catch for training the highest levels of power. The self-spotting mechanism is an application that allows the lifter to explosively throw a loaded barbel without having to catch it or absorb it (see image1).

Image 1

Resulting in first, training the highest levels of power. Secondly, greatly reducing ground impact forces that lead to injury. Lastly, because it uses a traditional free weight barbell, the user can load exactly the right amount of weight in order to achieve just the right desired power output levels.

The challenge of Olympic lifting as a form of power training.

Olympic lifting has become synonymous with strength and conditioning. Because when you look at many of the skilled Olympic lifters, they are extremely explosive and powerful. Which validates the ability to develop high levels of power through Olympic lifts. However, they are specialty lifts that require an immense amount of skill and technique. Take for example One of the more popular Olympic lifts – The Power Clean.

As shown, in the NSCA's recommended procedure in executing such a lift (9) there are a number of steps and technicalities that have to be followed. If one of those steps or procedures is not precisely executed, the lifter could potentially be injured.(10) The bottom line is, the power clean, like other Olympic lifts, is a complex sequence of movements. For that reason Olympic lifting is a sport that takes years to at the very least effectively master its most basic intricacies.

The question with using Olympic lifts as a means for training athletes who are not competitive Olympic lifters is: Does the potential risk of injury due to a lack of skill, outweigh the potential power gains? Because those athletes who are not competitive Olympic lifters, will place the majority of their focus on mastering the skill sets, and fundamentals of their sport of choice. Resulting in placing a lesser priority on learning the proper technique to perform Olympic lifts skillfully. Which diminishes the likelihood that such athlete will learn the fundamentals of Olympic lifting enough to justify the risk of injury. Or if an athlete has yet to fully develop proper technique in executing an Olympic lift, many strength coaches will ask that athlete to lift lighter. Resulting in steering that athlete towards the side of the velocity force curve where optimal power development isn't attainable. For those reasons, finding an effective counterpart to Olympic lifting is essential to optimize training power. Because Non-Olympic lifting athletes will find it hard to balance the learning of their sport of choice with learning the proper technique of Olympic lifts.

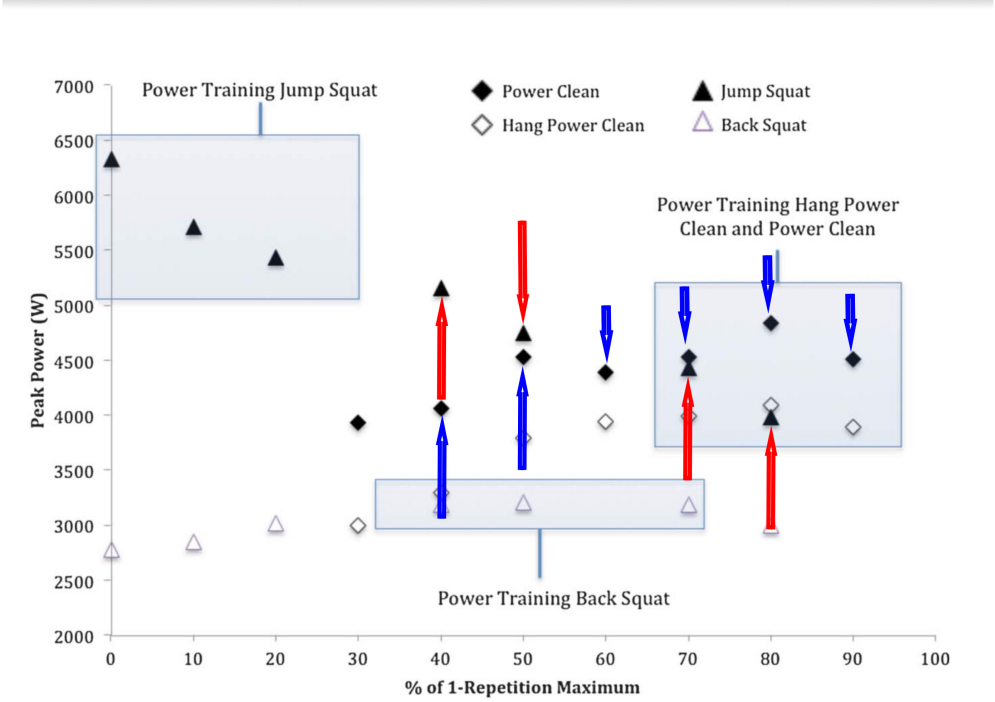
Some Alternatives to Olympic lifting.

The key in finding an alternative to Olympic lifting, is sealing out movements that develop power at the same level as Olympic lifts, but are easier to learn. As already discussed, using s self-spotting bar catch allows the lifter to throw or release a barbell at the end of the range of motion that generates acceptable power levels in power development training as long as the load is sufficient. Meaning that movements like jump squats, and push press throws can be a few alternatives to Olympic lifting.

Take for example this study comparing the ability to generate power doing power cleans versus jump squats(3). The study concluded that jump squats are just as effective in training high levels

of power as power cleans. Below you will find results (image 2) of such study that compared power levels generated by doing both jump squats and power cleans.

Image 2



If you average the power outputs (rounding to the nearest 1000w, 1250w, or 1500w) of both the jump squats (marked by red arrows) and the Power Cleans (marked by blue arrows) from 40% of 1 RM on up, these are the results:

- Power Cleans averaged - (4000+4500+4500+4500+4750+4500) = 26750/6 = **4458.33** (W)
- Jumps Squats Averaged - (5,000+ 4750+4500+4000) = 18,250/4 = **4562.5** (W)

The power levels generated by both exercises are very similar. With the Jump Squats producing slightly more power on average from 40% of 1 RM on up. As a side note, since those who did the study didn't mention that the jump squats were performed in an application that caught the bar for the lifter. The assumption is that the jump squats were done with the athlete having to absorb a free falling barbell. Which, as was established with the study comparing power development between a "braking group" versus a "non-braking group" in jump squat training(5), eccentrically absorbing the barbel limits power production. Therefore, it is safe to say the power levels in the graph would be higher if the jump squats were performed a self-spotter bar catching the barbel for the lifter. Establishing jump squats with a self-spotter bar catch as a perfect companion to Olympic lifting in performance training.

In summary, as long as an athlete has sufficiently learned the technique of Olympic lifting the risk of injury is greatly reduced. Making Olympic lifting a fantastic way of developing power. In a case to where a trainer is dealing with non-Olympic lifting athletes who are either struggling or

inexperienced with Olympic lifting, the risk of injury versus the reward of power development tilts too far towards the risk of injury. In that case, the easier to learn jump squats with a self-spotting bar catch can be a nice change-up in developing optimal power levels, and in most cases even a safer one.

Some ideas of how to integrate explosive training movements with a self-spotting bar catch.

The premise behind using a self spotting bar catch is to focus on generating the highest levels of power for two purposes. One is to wake up the body's nervous system and the other is to sequentially stimulate the muscles in a ballistic manner. Because of those to ends, utilizing the self- spotting bar catch can be used in prepping the body for explosive movements and exclusively training power.

When warming up to do a heavy load of any lift, waking up the body's central nervous system is essential. Utilizing these explosive movements with the self spotting bar catch are extremely effective in waking up the nervous system. For example, if you were going to be doing a heavy bench press day, warming up with some ballistic bench the throws would be a fantastic way to go.

Another scenario where these explosive movements on a self- spotting bar catch mechanism can be beneficial is right before doing Olympic lifts.The best one would be to do would be a jump squat. That's because it will sequentially engage those same muscles that will be utilized in an Olympic lift. Resulting in queuing up the explosive triple extension muscle sequence that is so vital with Olympic lifts.

Since these explosive movements on a self spotting bar catch mechanism are so closely related to competitive movements, super setting an explosive movement with a competitive one can be very effective. For example, When doing a jump squat or a push press throw, combined with a sprint, side shuffle, back pedal or dodgy weight jumps immediately following the explosive lift will only create a deeper association of the competitive movement and proper sequential explosive muscle activation. Basically what you'd be doing in this scenario is with the explosive movement you would be igniting the nervous system along with the physical muscles and then connecting them to a competitive moment. These are just a few ways that a self spotting bar catch can be used in a training environment.

In conclusion the need to train for power is essential in a performance training routine. The ideal training environment is one to where top power levels can be safely trained. Both traditional free weights and Olympic lifts although have their advantages, also have their shortcomings in training power. Traditional free weights lifts train the body to decelerate and slow down more than to accelerate. Olympic lifts are complex and if not properly performed could lead to injury. Outweighing the potential power gains. Useing a self-spotting bar catch can enhance those shortfalls in the following ways: First, it gives the lifter the ability to where the lifter can safely let go of or release a barbell at the end of the range of motion for maximal power generation. Secondly, movements that are less complex than Olympic lifts, like jump squats, can safely and effectively be performed. Lastly, it reduces ground force loads leading to a diminished potential of injury. Bottom line is, using a self-spotting bar catch coupled with traditional free weightlifting and Olympic lifting gives the athlete an optimal set of tools for ideal power development.

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