

INCREASE YOUR PUNCHING POWER

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Abstract

In this article we are going to.

- 1) Take a brief look at the “stretch shortening cycle” (SSC) concept
- 2) Look at different plyometric exercises (exercises that utilise the SSC concept) that will assist in increasing your punching power.
- 3) Look at the different movement patterns involved in setting up a SSC for punching in general and basic punching combinations.
- 4) Look at some basic biomechanical principles that will assist in increasing your punching power.

Before reading this article I recommend that you read “The Stretch Shortening Cycle in throwing and striking sports” and “What do all Martial Arts have in common”

Stretch Shortening Cycle (SSC)

A SSC is where a muscle group that is responsible for delivering force, is stretched out prior to a concentric contraction. As muscles have an elastic quality, this pre-stretch helps to catapult the muscles into a concentric contraction, which in turn produces greater force.

To maximise a SSC there are three key points that you need to consider.

- 1) **The speed of the first contraction (the contraction that sets up the pre stretch).** The speed of the first contraction is important, as it initiates the pre stretch which then carries over to the second contraction, the faster it is the more it contributes to the final power output.
- 2) **Duration of pause between contractions.** The pause between contractions is also directly related to power output, the longer the pause, the greater the loss of elastic energy which in turn means less power generated, the shorter the pause the greater the power output.
- 3) **The speed of the second contraction.** The faster the speed of the second contraction, the greater the power output.

The whole idea of the SSC is to increase the speed of the second contraction, if we look at the equation **Force = Mass x Acceleration**, the two key components to force (power) are mass (in this case your fist) and how fast you can move that mass (acceleration). The SSC uses the elastic energy in muscles to catapult the muscle group into the second contraction where it applies force.

Plyometric Exercises for increasing punching power

When performing plyometric exercises, you must ensure that quality is maintained, as soon as fatigue sets in and your technique starts to suffer it is time to stop.

Clap push-ups

In this exercise the participant assumes the push-up position, then performs a push-up in an explosive manner, launching their upper body off the ground to a height where the participant has time to clap their hands together then place their hands back on the ground in the original start position. In this exercise the participant continues to perform repetitions until there is a loss in technique (remember the 3 key points).



In this exercise the participant launches themselves vertically in line with gravity, therefore gravity sets up the SSC with an eccentric contraction. In this exercise the SSC assists in scapula protraction, shoulder flexion/horizontal flexion and elbow extension

Power push-ups from a kneeling position

In this exercise the participant kneels on the ground with their body vertical and their spine in the neutral position, the participant then falls forwards (keeping the spine in the neutral position) placing their hands on the ground in the push-up position, then explosively performs a push-up, pushing their body back to the original start position.



In this exercise the participant keeps performing repetitions until the participant can no longer push themselves back to the start position or until there is a loss in technique (remember the 3 key points).

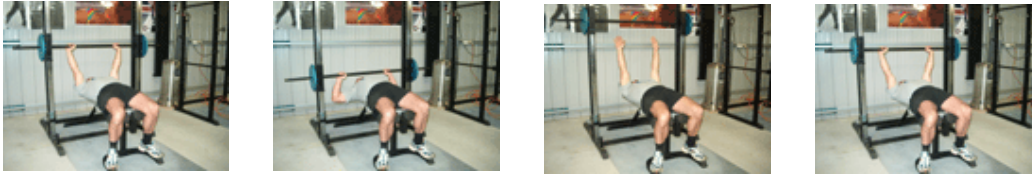
In this exercise the participant initially launches themselves vertically in line with gravity, therefore gravity sets up the SSC with an eccentric contraction.

In this exercise the SSC assists in scapula protraction, shoulder flexion/horizontal flexion and elbow extension.

When performing “clap push-ups” and “power push-ups” (from a kneeling position), the participant usually works towards completing as many reps as possible until there is a loss in technique (power endurance), these two exercises can also be performed using a weighted vest, where the participant works towards set rep ranges.

Bench-Press throw

In this exercise the participant sets up a Smith-Machine as if to do a regular Bench-Press, the participant then unlocks the bar and lowers the bar to the chest at a rapid pace then explosively pushes the bar into the air (and out of the hands), attempting to achieve as much height with the bar as possible, then catching the bar.



Increasing the weight of the bar will result in a loss of speed and height, each time you increase the weight of the bar, your 2 main objectives will be to work on the speed component and work towards achieving the same height reached with the previous lighter weight. If the weight is too heavy there will be a noticeable loss in speed, height and technique (remember the 3 key points).

In this exercise the participant launches the bar vertically in line with gravity, therefore gravity sets up the SSC with an eccentric contraction.

In this exercise the SSC assists in scapula protraction, shoulder horizontal flexion and elbow extension

Horizontal push-press

In this exercise the participant holds a BB at chest height while standing in a shoulder-width stance.

- 1) The participant then explosively drives the BB horizontally while at the same time driving the left foot forwards and the right foot backwards into a fighting stance.
- 2) The participant then explosively pulls the bar back into the chest while at the same time explosively returning the feet to a shoulder-width stance.
- 3) The participant again explosively drives the bar horizontally this time the right foot is driven forwards and the left foot is driven backwards into a fighting stance.
- 4) This sequence is repeated again and again.



In this exercise the participant either works for maximal reps (power endurance), stopping when there is a loss in technique, or works towards a set rep range. Increasing the weight of the BB will result in a loss in speed, the participant will also find it harder to be able to continually keep the bar at chest height as gravity is constantly pulling the bar in a downwards direction. Each time you increase the weight of the BB your objective will be to work on the speed component while keeping immaculate technique, if the additional weight is too heavy, there will be a noticeable loss in speed and technique (remember the 3 key points).

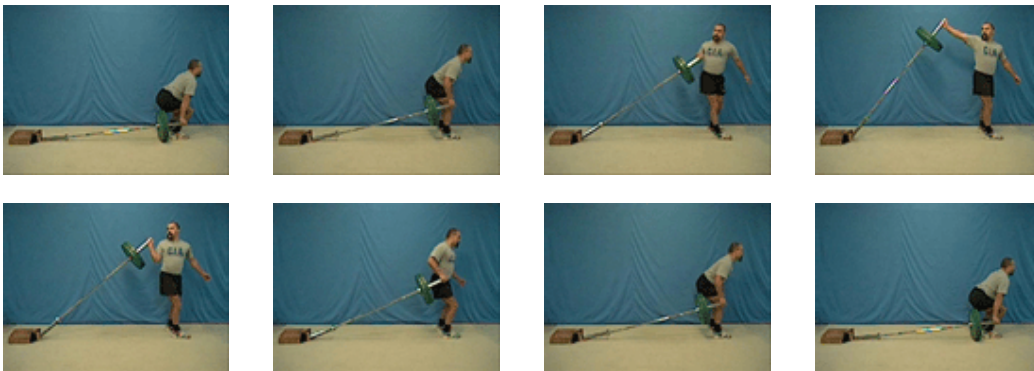
In this exercise the horizontal pushing is done from a standing position (the body being vertical) unlike the previous three exercises where the horizontal pushing was done in a prone or supine position (the body being horizontal). This is important to note because in the previous three exercises the SSC was set up by an eccentric contraction as the horizontal pushing movement was in alignment with gravity, however in this exercise the horizontal pushing movement is perpendicular to gravity, therefore the SSC isn't set up with an eccentric contraction, it is set up with a concentric contraction from the opposing muscle groups ie your scapula retractors set up a SSC for you scapula protractors, your shoulder horizontal extensors set up a SSC for your shoulder horizontal flexors and your elbow flexors set up a SSC for you elbow extensors. Although the previous three exercises are useful in power development for punching, we have to remember that when throwing punches from a standing position, the opposing muscle groups are often responsible for setting up the SSC and therefore will benefit from training that is more specific to their needs.

One arm landmines

This exercise I picked up recently from Jim Smith and Jedd Johnson over at the Diesel Crew (www.dieselcrew.com), I have slightly modified the original version of the exercise to better replicate movement patterns in "mixed martial arts". Although the power generated in this exercise is largely due to brute force and momentum rather than the use of the SSC, I feel that this exercise has a lot to offer all combatants so I've included it in this article.

In this exercise the participant places a weight on one end of an olympic bar and wedges the other end of the bar into a 90-degree corner.

- 1) The participant grabs the end of the bar while standing in a regular dead-lifting stance.
- 2) The participant then explosively extends their knees, hips and trunk, lifting the bar off the ground.
- 3) As the bar approaches hip height, the participant starts rotating the trunk while at the same time pulling the bar to the shoulder by flexing the elbow (using the momentum that is set up from extending the knees, hips and trunk).
- 4) As the bar approaches the shoulder the participant explosively pushes the bar away from the body in a punching motion.
- 5) The participant then extends/adducts the shoulder to bring the elbow along side the body, then internally rotates the shoulder to bring the bar along side the body, then eccentrically dead-lifts the bar, lowering the bar back to the ground



The rotation of the upper body is set up by the momentum generated from the extension of the knees, hips and trunk. The flexion/abduction of the shoulder is set up by the momentum generated from the extension of the knees, hips, trunk and the rotation of the upper body. The extension of the elbow is set up from a SSC generated from the flexion of the elbow as well as momentum generated from the previous steps.

This exercise is similar in nature to a power-clean in that there is a chain of events that must be executed with immaculate technique to make the exercise work, if one link in the chain is weak the exercise will fail (especially when lifting near maximal to maximal loads).

Measuring your power out put

For years I've been looking for a cheap effective way to measure your punching power, not so much as to how much force you are producing, but more along the lines of being able to assess as to whether your punching power is increasing, staying the same or decreasing. Recently I came up with the idea of using a shot put and slightly modifying the throwing technique to make the exercise bio-mechanically similar to throwing a cross from an orthodox and southpaw fighting stances. Throwing a shot put in the same manner in which you would throw a punch is a great means to measure your punching power, if the distance that you are throwing the shot put is increasing and you are still able to hold good form, then your punching power must also be increasing. Throwing a shot put in the same manner in which you would throw a punch is also a great exercise to develop your maximal power in the same manner you would use a 1RM in the gym for strength training. In this exercise the participant adopts an orthodox-fighting stance and holds the shot put in their right hand, resting the shot put against their cheek. The participant then explosively throws the shot put as if they were throwing a right cross from a standing position, rotating their upper body anti-clockwise, throwing their right shoulder forwards while pulling their left shoulder backwards. It is important that the technique used to throw the shot put is the same as the technique used to throw a right cross. To keep the exercise simplistic and effective, keep your feet stationary and don't use any unnecessary momentum to assist you in throwing the shot put. The same exercise is then repeated off the opposite side of the body, using the left hand to throw the shot put as if throwing a left cross from a southpaw fighting stance.



Shot puts come in a range of sizes going from 2kg to 8kg in 1kg increments. Start with a 2kg shot put which is approximately six times the weight of a 12-oz boxing glove, as the 2kg shot put is considerably heavier than a 12oz boxing glove, there will be a considerable loss of speed at which the shot put is thrown compared to the speed at which a right cross is thrown with a 12oz boxing glove on. Initially your objective is to work on the speed component while keeping immaculate technique, if the speed at which you throw the shot put increases then your throwing distance will increase which in turn means that your power output has also increased. Each time you go onto a heavier shot put, your training goal will be to work towards achieving the same distance thrown with the previous lighter shot put, if the shot put is too heavy there will be a noticeable loss in technique and speed and distance.

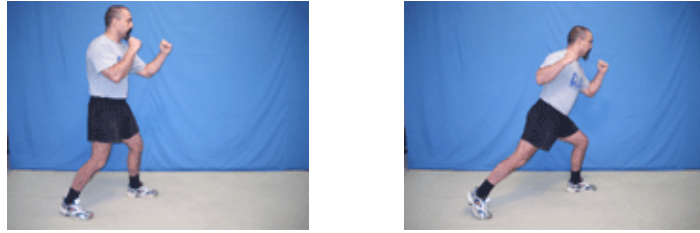
Movement patterns that set up a SSC

In this section we are going to look at the three basic movement patterns involved in setting up a SSC for punching in general and basic punching combinations. All movement patterns are described with fighters being in an orthodox fighting stance.

When throwing multiple punches with the same arm eg double jabs, triple jabs, jab-left hook etc it is the opposing muscle groups that are responsible for setting up the SSC. Your scapula retractors pull your left shoulder girdle backwards, setting up a SSC for your scapula protractors to re-launch your left shoulder girdle forwards, your shoulder extensors/horizontal extensors set up a SSC for your shoulder flexors/horizontal flexors and your elbow flexors set up a SSC for your elbow extensors.

When throwing alternate punches eg jab-cross, jab-cross-jab, jab-right hook, jab-uppercut etc it is again the opposing muscle groups that are responsible for setting up the SSC. As you throw a jab, your left scapula protractors launch your left shoulder girdle in a forwards direction as your right scapula retractors pull your right shoulder girdle in a backwards direction, this in turn sets up a SSC for your right scapula protractors to launch your right shoulder girdle forwards as you throw your next punch. As you throw your jab, your left external obliques and right internal obliques rotate your upper body in a clockwise direction which in turn sets up a SSC for your right external and left internal obliques to explosively rotate your upper body in an anti-clockwise direction as you throw your right cross, right hook, right uppercut etc. Throwing your right hand now sets up a series of SSC's for your left hand.

When leading with a right cross, it is important that you don't telegraph your intentions by loading the punch (retracting the shoulder girdle and extending/horizontally extending the humerus), ideally loading the punch would be advantageous as it would set up a series of SSC's which would in turn increase the power of your punch. To get around this you can use foot work to lunge towards your opponent at the same time leading with your body and holding your right shoulder girdle back, this in turn sets up a SSC for your scapula protractors and shoulder flexors/horizontal flexors in the exact same manner as loading your punch, without telegraphing your intentions.



Generating power with the use of your body weight

Our body weight and how we use our body is an important factor when generating force. If we throw a punch from while standing still, the power that is generated comes from the weight of our arm and the speed at which our fist travels. The use of a SSC means that we can generate more speed, which in turn will increase our power, however if we can get our body weight behind our punch by using the appropriate footwork, our power will increase considerably (remember the equation $\text{Force} = \text{Mass} \times \text{Acceleration}$). When accelerating our selves at our opponent, the more mass we have and the faster we can move that mass the greater the impact of our strike. (For more information on footwork read "Skill Development part 2)

Conclusion

Now you have a better understanding of power development and the SSC concept, you can now

- 1) Introduce effective plyometric exercises into your training that will assist in increasing your punching power
- 2) Analyse your current punching technique, and where necessary modify your technique to be biomechanically more effective at producing power.

