

Back Squats vs. Leg Press

By: Charlie Cates, CPT, PES

<http://selfmadefitness.com/>
charlie@selfmadefitness.com/

A lot of people have recently told me that they prefer to perform leg presses as opposed to squats. Their main argument is that squats are unsafe due to the compressive forces on the spine. While I don't have exact numbers to back my claims, I will ask you to use logic and reason as I try to defend my beloved squats in this argument of leg development superiority and overall safety.

Okay, first things first, can we all please agree that the squatting motion is a very natural and basic human movement? I'm not talking about heavily loaded squats, but the act of sitting down and standing up is literally vital to everyday living. If you are not in agreement with this statement, then I would ask that you send me an e-mail at charlie@selfmadefitness.com and enlighten me on what life is like for someone who poops standing up. All jokes aside, though, it is clear that to say, "Squatting is bad," is beyond reason and debate.

A "functional exercise" is an exercise that produces an appropriate physiological or psychological adaptation according to one's goals and/or has a direct transfer to an improvement in performance in either sport or life. Squats fall within this definition because of their direct use in everyday life. Therefore, the question at hand is, "At what point, i.e. with how much external resistance, does a 'good' exercise become a 'bad' exercise, due to the excessive load on the musculoskeletal system, if the exercise is performed properly?" As a side note, there are many different styles of leg press out there. For the purpose of this article, I will be referring to a hip sled when I say "leg press".

So, let's look at what the squat and leg press have in common. First, they both offer a movement by which to develop the quadriceps and hamstrings through flexion and extension of the knee joint. Second, they both are highly demanding of the Central Nervous System (CNS) due to the fact that heavy weights are often being moved with these exercises. If heavy weights are not being moved, such as during a body weight squat, then the CNS demand will be less. Aside from these two aspects, however, the squat and leg press are really not that similar.

Before I begin to address what I perceive to be the weaknesses in the arguments put forth by proponents of the leg press, allow me to tell you some of the major benefits of the squat. Obviously one of the biggest differences between the two exercises is that with the leg press you are locked into one plane of motion, while with the squat you have to stabilize and move through multiple planes of motion. The squat, when performed correctly, is not just a sit straight down and stand straight up movement. If you watch somebody squat who knows how to properly do so, you will see the bar move in an arc throughout the repetition. Picture a "C", but with a much less dramatic curve. This is just one of the many reasons why squatting on a Smith machine is absolutely ludicrous—it forces your body through an unnatural, straight down, straight up motion. Furthermore, all of the stabilizing muscles of the upper trunk, core, and lower extremities are heavily taxed, i.e. strengthened, during the free-weight version of the movement.

Looking at the mechanics of the two exercises, one of the biggest flaws I see in the argument of those supporting leg press is how underutilized the gluteals are in this movement. Watch somebody perform a leg press next time you are in the gym, or better yet try it for yourself, and you will see that there is absolutely NO hip extension anywhere in the movement. The hips stay flexed throughout the ENTIRE range of motion. If you won't be going to the gym for a bit and don't believe me, think about this: if you are lying on your back and pressing a weight up into the air with your legs, your body has to be bent, and stay bent, at some point, correct? And, if your body is going to be bent, it is either happening at the hips or somewhere along the spine. It is physically impossible for your body to bend at any other point along the kinetic chain and produce the motion I am talking about. So, if your body is bent, when you lower the weight before you press it up, all of that load will be absorbed by where you are bent because that is going to be your strongest and most stable point. If you are able to extend your hips at all during this motion it means that you are bending at your spine, and are probably suffering from a traumatic weight room injury to the spine while using the leg press. So, assuming you haven't broken your back while using the leg press, this would leave me to believe that you are keeping your hips in a flexed position during the movement and consequently not activating the glutes, which are the most powerful muscles in your body.

I'm not going to go into every single movement difference between the two exercises because that is too great for the scope this article. But, understand that the fact that there isn't movement at the hips is a huge deterrent for me to use the leg press for any athlete, competitive or everyday, because of the lack of glute development, unless my sole intention was for quad development. Also, because all of the movement is happening at the knee and ankle joints (assuming nothing is happening along the spine), if the range of motion is great enough the knees will absolutely be going beyond the toes, and in some cases way beyond the toes, which may or may not be appropriate for the individual.

The argument that the leg press is a safer exercise is total and complete nonsense, in my opinion. Yes, there are compressive forces on the spine when performing a back squat, but there are compressive forces on the spine during a leg press as well. In addition, if you squat with proper technique and are able to activate your TVA properly, I strongly believe that your body will protect your spine from injury. I haven't seen studies on this, so this is all speculation, but my reasoning is that because squatting is such a basic, primal human movement, if it is executed properly and if we as participants are progressed properly as far as increases in external resistance, we shouldn't be able to hurt ourselves doing it. Now, somebody might read this and call me out for BSing, and that's fine. Like I said, I haven't seen studies to tell me how much compressive force is found during a leg press compared to a squat of the relative same weight. But, because the squat is a movement that we need for survival, if it is done properly, I don't see how it can be detrimental. That's not to say people don't get hurt squatting. People get hurt all the time, but that is hardly the fault of the exercise. Instead, it injuries happen because of improper technique, improper progression, or muscular imbalances within the athlete. Moreover, if the athlete is having to compensate to achieve what appears to be proper squat form then this may lead to injury as well.

On top of all this, I like to also think back to what cave men did when making a lot of decisions in my life. In my mind, if a cave man killed a large animal while hunting, he wasn't going to drag it back to his cave to cook. Instead, I would imagine that he would load it onto his shoulders and carry it back, much like we load a barbell on our shoulders today. Because this was a necessity to life, the human body has a means to allow for it to be done safely, and therefore it is hard for me to believe the compression argument. Once again, though, that scenario is purely speculation.

I have also heard the argument that there is torque placed on the body during the squat. Yes, this is true, but your body should be so rigid and tight while you squat that the only places that have the ability to move are your hips, knees, and ankles in flexion and extension. There may also be some abduction of the femur if you push your knees out on the decent of the squat. Everything else, however, should be locked into place. So, yes, while there may be torque, the only places it should be seen are through the joints that you want moving and in the direction you want them moving in. There shouldn't be any rotational torque or lateral torque. If there is, then it is an error in the athlete's movement pattern, not in the exercise itself. Furthermore, if there is an error in the athlete's movement pattern, it will come out even if the athlete uses the leg press; it just might come out through a different joint or series of joints because the spine and hips are locked into place, in which case injury is inevitable.

I'm not going to go into how far down an athlete should go during a squat or leg press. That is a multi-factorial question and one that varies by the individual. I have noticed, however, that most people get a greater range of motion while using a leg press as compared to a squat. I don't know if that is psychological (getting stuck at the bottom of a leg press rep may seem less threatening than getting stuck at the bottom of a squat rep) or physiological, but it is something I have noticed.

In conclusion, whether you use a leg press or a squat to develop your lower body should be based on your goals as opposed to your perception of each exercises' relative safety, because if performed correctly and with the correct stimulus, squatting is not only a safe exercise, but a necessary exercise for healthy human function.

Get big or die tryin'.

Charlie Cates is a human performance specialist and the owner of Self Made (<http://selfmadefitness.com/>) in Chicago, IL. He is a Certified Personal Trainer and Performance Enhancement Specialist through NASM and has worked with competitive and everyday athletes of all ages and ability levels, from 9-year-old kids to NFL MVP's. He can be reached via e-mail at charlie@selfmadefitness.com.

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