

1. What is a “Leap”? Understanding Feedback Loops

I sometimes wonder who made the biggest leap in the history of running. Whose improvement from one season to the next was so large that it simply defied common sense?

The biggest, most impressive leap by someone I know was made by my friend and teammate Jon Rankin.

Jon arrived at UCLA and quickly established himself as a solid 1500 meter runner. He ran 3:47 as a freshman and won the 1500 meter race at the Junior U.S. Championships. Then for the next three years, he struggled with injuries and inconsistency, and made few improvements to his

personal bests. He was extremely frustrated, and considered quitting.

Jon expected to be an elite miler. But he wasn't achieving that goal. He didn't even feel he was making progress. The disconnect between his goals and his performance made him feel like a failure.

Midway through his junior year, he did a complete reset. He made a conscious effort to change the way he thought about his training. Rather than focus on his big goals, he decided to emphasize doing the work and enjoying it. He was no longer going to judge himself on his results. He would focus only on his execution.

A remarkable thing happened. A metaphorical weight was lifted and he started performing better.

By the end of his fourth year, he had lowered his 1500 meter time to 3:43, close to a 4-minute mile. He finished 4th at the PAC-10 championships. The next cross country season, he was the #1 runner and earned All-American status at the NCAA Championships. He was very good. And then he made a ginormous leap.

The following spring Jon recorded 17 personal bests and lowered his 1500 meter time to 3:35 (roughly a 3:53 mile). He took four seconds off his personal best over four years, and then took another eight seconds off in one year. For someone at his level, a leap this big is practically unheard of.

Anyone, at any level, can make a leap. But the better you are, the harder it gets and the smaller the leap tends to be. There just isn't that much improvement to be made.

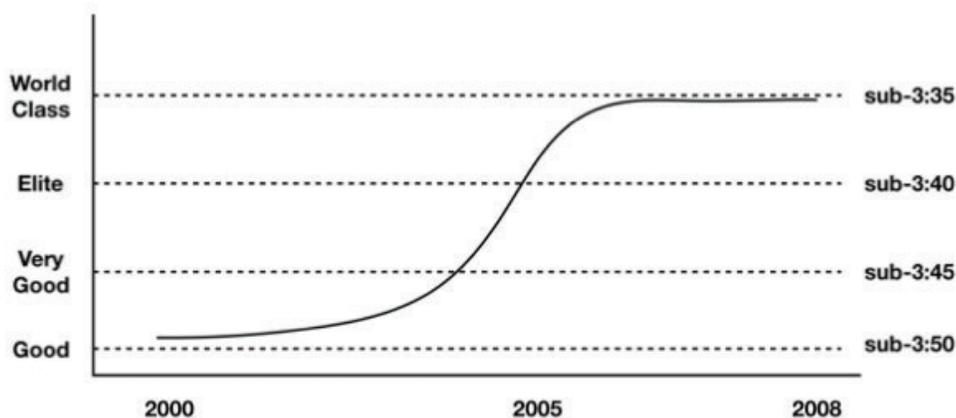
Most people make a leap from average to good (this was me). Fewer make the leap from good to very good. And very few make the leap from very good to elite. Jon went from very good to the 5th fastest American and 38th fastest

performer in the world that year. He leapt right over elite and went straight to world-class.

“Anyone, at any level, can make a leap.”

He then continued to train at a world class level for the next few years. Despite battling numerous obstacles, he maintained this form and just missed qualifying for the Olympic Games in 2008. He stopped running competitively at that time after being diagnosed with chronic kidney disease.¹⁰

Jon’s leap was rare simply because of the degree to which he improved. But if we ignore that aspect, we can see that it was structurally the same as any other leap. It started with a long period of gradual improvement, then his improvement shot up, before plateauing again at a new (much higher) level. On a graph it would look something like this.



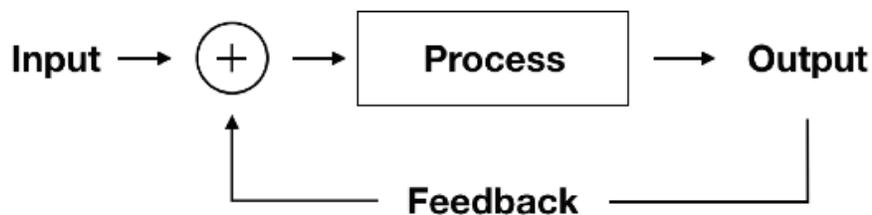
¹⁰ You can learn more about Jon and follow his organization Go Be More at <https://gobemore.co>. (Note: I am a co-founder of the company.)

Every person who makes a leap has an improvement curve that looks like this one. The labels are different, but the general shape is the same. Let's break down exactly how this type of improvement happens.

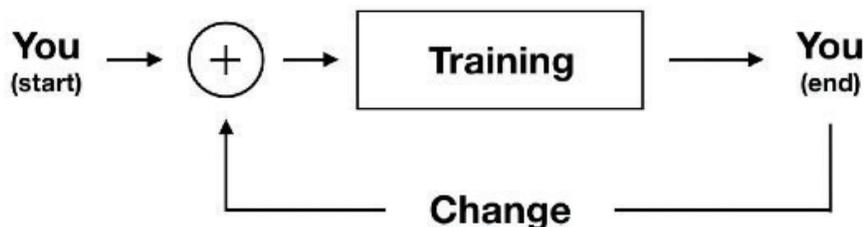
It starts with understanding feedback loops.

Feedback Loops are Fundamental

In a feedback loop, you start with an input and run it through a process. The output then “feeds back” into the process, becoming an input. You can diagram it like this:



You may have heard of this by another name. We sometimes refer to positive feedback loops as *virtuous cycles* and negative feedback loops as *vicious cycles*. Customer reviews are a simple example of how one system can generate both. Five-star reviews help generate more business, whereas one-star reviews reduce future business.



Our training is a feedback loop. The input is our current ability. The process is our training program. The output is our ability post-training. If you are continuously improving, then the process starts with a slightly improved “you” each day.

Let’s really make this concrete and break down the main components individually.

You: You are both the Input and the Output of your training program. But “You” consist of more than just your physical body. “You” includes also how you think and feel. There is a huge difference between starting your training feeling healthy, energetic and confident versus feeling broken down, tired and dispirited. Part of maintaining a positive feedback loop is *feeling positive*.

Training: Training does not equal workouts. Our workouts are just a part of our training. There is much more we need to do. I call this the Hidden Training Program: *everything you really need to do to be successful*. The Hidden Training Program includes your diet, sleep, living situation, social activities, work, and studies, as well as your formal training program¹¹.

Change: Change can be positive, negative, or neutral. If you injure yourself, it’s negative. If you get better, it’s positive. In a short time frame—like one day—it can be hard to see any change.

Time: We can view our training feedback loop from any time frame. We typically think in terms of seasons and

¹¹ We’ll cover this in detail when we discuss Engagement.

years when we want to track our overall development. We think in weeks when we want to analyze our training program. And we think in days when we want to focus on building better habits.

Your actual feedback loop is impossible to calculate, especially at the daily level. We have no idea what percent of yesterday's improvement is fed back into today.

That's fine. It's more important to understand this conceptually, because it's fundamental to understanding how leaps are made.

Put simply, the goal is to wake up every morning retaining as much of your previous improvement as possible. That way your training begins to compound on itself.

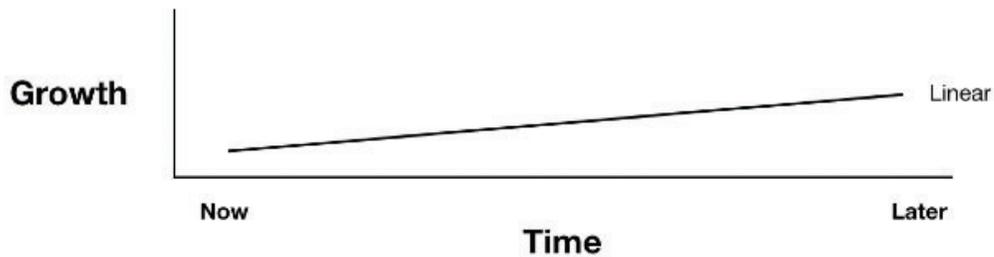
Improvement Doesn't Follow a Straight Line

We are primed by our daily experience to think in linear terms. A little effort here leads to a little improvement there. And if we just keep doing what we are doing, we'll eventually get where we want to go.

Here's a simple example:

- If I put my spare change in a jar every day, after one day I'll have a small amount
- After one month I'll have roughly 30 times as much change
- After one year I'll have roughly 365 times as much change

The growth looks like a straight line. And this makes sense to us. In fact, I'd argue that most people mistakenly think of their training this way: "If I just bank each day's



workout, consistent improvement is sure to follow.” I know that’s how I thought about training when I first started.

In this way of thinking, feedback loops don’t matter. Our quality—how well we improve—doesn’t change. We have to do more to get more.

Many things in the world are linear, but not all. There are some areas that grow exponentially, for example compound interest (i.e. credit card debt), technology adoption, rabbit populations, and our ability to learn. These systems compound over time, meaning continuous small changes accumulate over time to create dramatic future change.

It is easiest to explain this using money. Imagine two people each invest \$1,000 every year and get 10% interest. Each get paid \$100 at the end of the year. Person A takes the money and spends it on nice dinners. Person B reinvests the money. The following table outlines how their relative investments change over time.

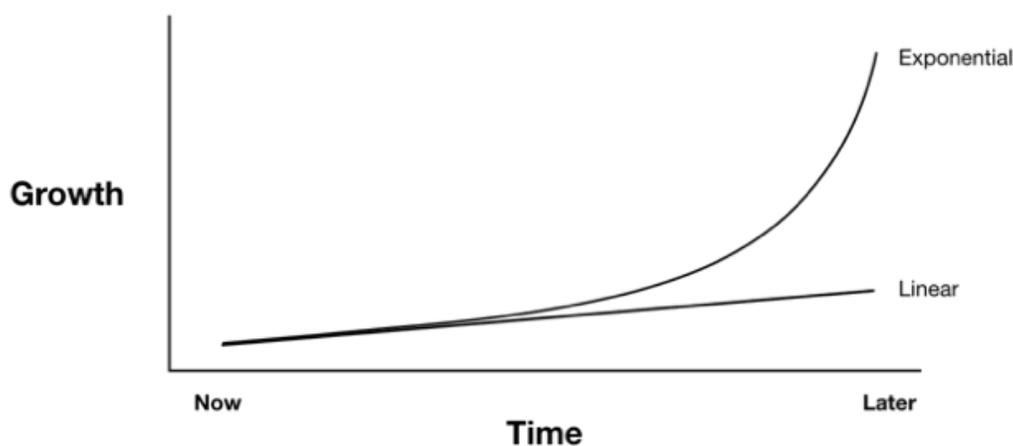
After one year, there is no difference between the two. After five years, the difference is hardly noticeable. After 10 years we are starting to see a slight gap. But you could easily argue that the enjoyment Person A gets from spending the cash is worth it.

It isn’t until we get way out into the future that we can start to see the real differences. After 25 years Person B will

		1 Year	2 Years	5 Years	10 Years	25 Years	50 Years
Person A	Principal	\$1,000	\$2,000	\$5,000	\$10,000	\$25,000	\$50,000
	New Investment	\$1,000	\$1,000	\$1,000	\$1,000	\$1,000	\$1,000
	Interest Re-invested	\$0	\$0	\$0	\$0	\$0	\$0
	Total Principal	\$2,000	\$3,000	\$6,000	\$11,000	\$26,000	\$51,000
	Cash Spent (Cumulative)	\$100	\$300	\$1,500	\$6,600	\$35,100	\$132,600
	Total Principal + Cash	\$2,100	\$3,300	\$7,500	\$17,600	\$61,100	\$183,600
Person B	Principal	\$1,000	\$2,100	\$6,105	\$15,937	\$98,347	\$1,163,908
	New Investment	\$1,000	\$1,000	\$1,000	\$1,000	\$1,000	\$1,000
	Interest Re-invested	\$100	\$210	\$611	\$1,594	\$9,835	\$116,391
	Total Principal	\$2,100	\$3,310	\$7,716	\$18,531	\$109,182	\$1,281,299
	Cash Spent (Cumulative)	\$0	\$0	\$0	\$0	\$0	\$0
	Total Principal + Cash	\$2,100	\$3,310	\$7,716	\$18,531	\$109,182	\$1,281,299
Person B Increased Earnings		\$0	\$10	\$216	\$931	\$48,082	\$1,097,699

have almost \$50k more money, and after 50 years Person B will have over \$1 million more in the bank.

Here's what exponential growth looks like visually. The two lines follow a similar trajectory for some time. Early on, even exponential growth looks linear. But after they diverge the gap gets bigger and bigger.



This same concept applies to training. Imagine instead of years that we are talking about weeks of training. The more of each week's improvement you retain, the

faster you will arrive at the inflection point where your improvement starts to go vertical.

Here's the thing: in the beginning, you don't see any difference! When forced with the decision to eat healthy or eat junk, you will rarely notice any difference tomorrow. It takes a long-term perspective to understand that eating healthy food is like reinvesting your interest. Eating healthy food everyday creates an opportunity for us to compound the benefits. Likewise, eating junk food is like taking the cash and having fun with it. The same applies for extra stretching, treatment, sleep, etc.

Or consider stopping a great workout while you still feel great. How many of us push too hard when we feel great simply *because* we feel great that day? We feel like we've got that cash in our hand so we just spend it.

I remember a teammate was late for lunch one Sunday because he ran 27 miles that morning. He was scheduled to run 18 but was feeling great so he decided to just run a full marathon distance, something he'd never done before.

You only do this if you view training as a linear process. 27 miles is better than 18 because doing more gets you more. But his legs were sore and tired the next day (understandably) and while I can't prove it, I would bet those extra miles hurt him more than they helped.

One great workout doesn't make you a champion. One hundred great workouts won't either. It could take thousands before you are even close.

When you understand that improvement is not linear, and that positive feedback loops lead to compounding improvement, you behave differently. You focus on quality work and feeling good. You don't look for dramatic improvement today. You train knowing the big improvement will come in the future.

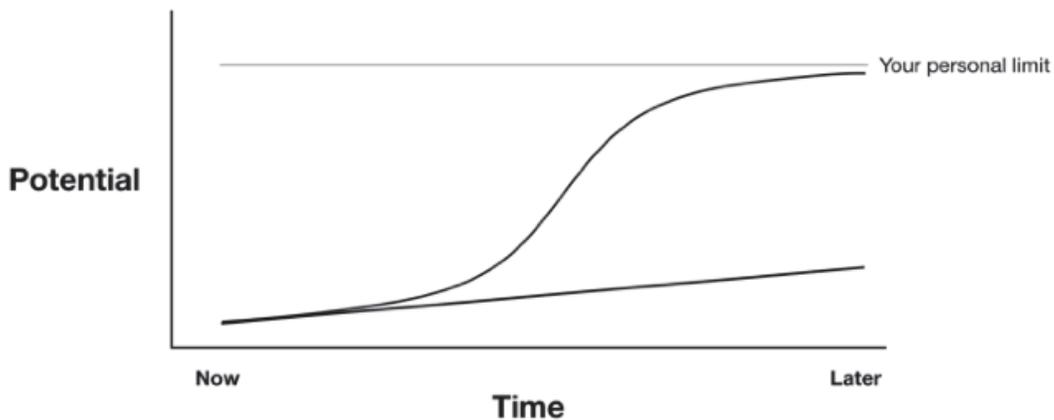
The Limits of Our Potential

I bet you're asking, "How can training be exponential when we obviously can't just improve forever?"

Training and earning money *are* different in one key respect. There is no theoretical limit to how much money we can have, whereas everybody has a limit on how fast they can run. We call that limit our potential.

Take the marathon. Eliud Kipchoge recently broke the two-hour barrier, which is an amazing milestone for the human race¹². We don't know what our limit is. It could be 1:59 or it could be 1:55.

The actual limit is less important than the acknowledgment that it's there, somewhere. For our purposes, we just need to be able to draw it on a picture.



Let's assume our potential is represented as an upper limit. Our improvement curve rises exponentially and then

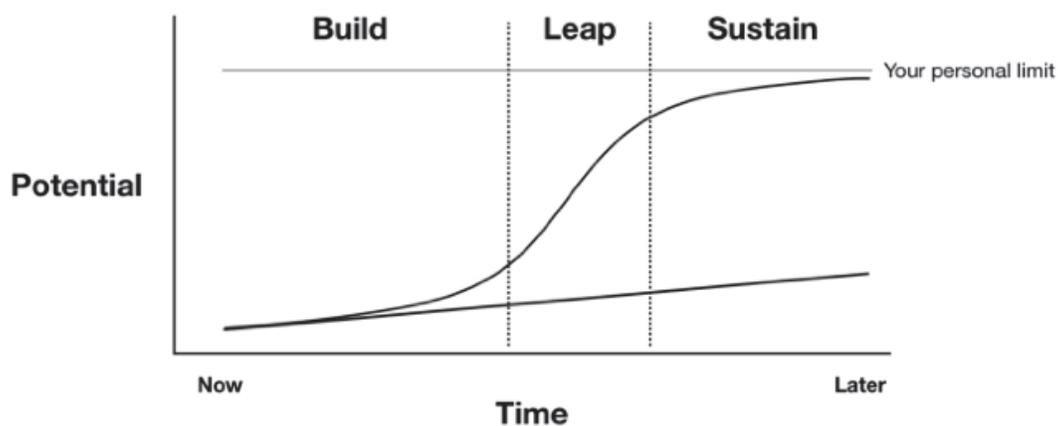
¹² Some would argue it's an amazing milestone for our shoe technology. There's no need to argue. It's both!

naturally bends to approach the limit. As you no doubt realized, this is *exactly the same shape* that we charted with Jon’s leap earlier.

We start by creating positive feedback loops. These feedback loops lead to compounding improvement. Compounding over enough time leads to exponential improvement. The level of that exponential improvement is determined by how good the feedback loop is as well as the limits of our short-term potential.

Breaking down the “Leap Cycle©”

Now, imagine you are maintaining a positive feedback loop and setting yourself up to make a leap. Here’s a breakdown of the “leap cycle”:



1. Build: For some period of time, you won’t see much difference. It still feels linear. This period lasts months, cannot be avoided, and is completely normal.

2. Build to Leap: Things start to feel a bit easier. You feel a little better at the end of hard workouts. You finish a little

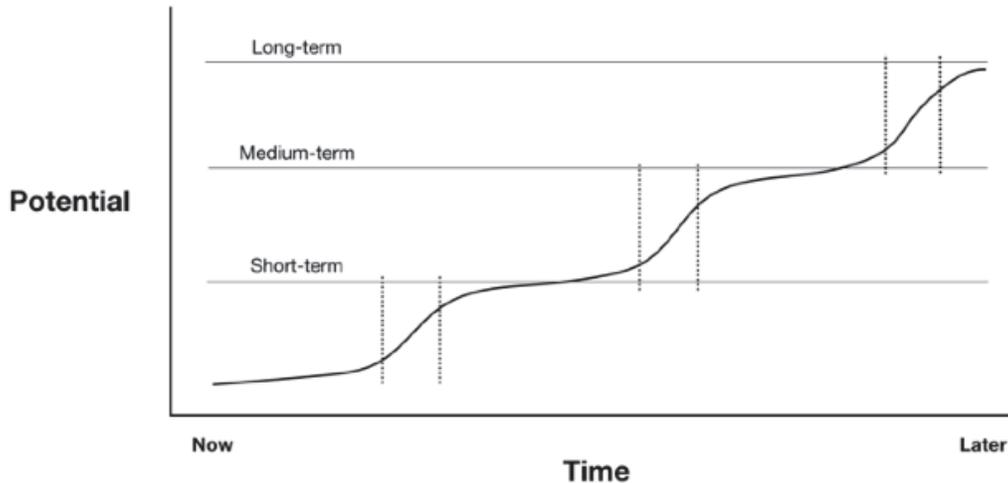
stronger at the end of some races. You aren't significantly better than before, but you're consistently performing well. Something is working.

3. Leap: You find yourself competing with people who were formerly better than you. You start blasting big PRs. You feel like a new person with new powers, but you also have some doubts because you don't know the extent of your ability. You begin systematizing many areas of your life to ensure you don't lose these new powers.

4. Leap to Sustain: You enter races knowing you are going to run well and you feel you belong at this new level. It feels like a failure to imagine a performance at your previous level. Your improvement energizes you to stay disciplined and maintain your newfound ability. You're having a lot of fun.

5. Sustain: You are reaching your upper limit. Your old training group and competitors are in the rearview mirror. So are poor performances, which you've mostly eliminated. However, you aren't seeing many improvements, despite your hard work. It starts to look and feel linear once more. Again, this cannot be avoided and is completely normal.

If you are still young and early in your career, making the leap above does not mean you have reached your potential. It is more likely your Sustain phase is transitioning into another Build phase prior to another leap. If you are an older veteran and have lived an optimal training lifestyle for many years, you may not have another significant leap to make. But the same process that leads to a leap will help stave off age-related decline as long as possible.



We can imagine an athlete’s career in the above chart. An athlete can make many leaps, but each will have the same stages: Build, Leap, Sustain. *The difference between making a leap and not making a leap is in the quality of our training.*

“The difference between making a leap and not making a leap is in the quality of our training.”

Every leap is preceded by a change. The most effective changes are improvements in quality—how well we train—which compound over time. For most of us, improving our mental approach to training is the most effective change we can make. It’s the change that’s most likely to result in a major leap.

After you make a leap and enter the Sustain phase you need to figure out where you can again increase the quality of your training. This could mean doing higher quality workouts, doing the same workouts even better, doing more while maintaining your quality, or improving areas of your life that indirectly affect your training.

No matter how big a leap you make in the short-term, it won't get you to your long-term potential. You simply can't reach your potential in a few months. It will take multiple leaps over multiple years.

But I have good news: the first leap is the easiest! It doesn't really take that much.

“The good news: the first leap is the easiest!”

Your first leap should come within one season to one year. It depends in part on where you are and on how positive your feedback loop becomes.

If you can continually improve your positive feedback loop, you will see further leaps in the mid-term (2-3 years), with long periods of build-up in between. These periods with zero visible improvement are normal, too. They are the times when your body is creating a new baseline. It's from these new baselines that you need to improve your quality so that it can grow into another leap.

In the long-term (7 to 10 years), you will approach achieving your potential. During that time, build phases get longer and the leaps get smaller—you can't keep taking one minute off your 5k time forever—but they are still there. And throughout, your “normal” will become consistently excellent.

As coaches, this is what we want from all our runners. And it is completely natural, predictable, and achievable. But only if our training and our lifestyles are creating the positive feedback loop to make it happen. Our lifestyles determine our leap cycles.