Perfect Shmerfect. The Stage of Practicing When More "Mistakes" Is Better for Learning.

## Description

I tried to teach my kids how to play Mario Kart when they were 1 and 3. You can probably imagine how it went. They spent most of their time swerving all over the road, falling off the track into water, getting completely turned around and going the wrong direction, or stuck in a corner (which kind of makes me cringe in anticipation of real driving lessons when they're 16…).

Of course, such errors and mistakes are to be expected anytime we learn a new skill. At first, our performance is highly inconsistent, and we assume that effective practice will smooth out these issues over time.

But in the meantime, all these misses can be disheartening, and even make us worry that the effectiveness of our learning is being compromised. After all, it's often said that practice doesn't make perfect, but only *"perfect"* practice makes perfect.

So do all these mistakes in the early stages of learning mean that we're developing bad habits that we will have to unlearn later? That we should try to be as consistent as possible from the very beginning?

Or do we not have to worry quite so much?

# Songbird learning behaviors

Research has found that young songbirds have more variability (i.e. inconsistency/errors) in their singing than adult songbirds.

And when performing for a potential mate, they reduce the variability of their singing, compared with when they're alone and practicing. Which sounds super cute, right? And also makes me wonder if perhaps it's possible that young little songbirds experience some avian version of performance anxiety…

In any case, when researchers have deactivated a certain part of the birds' brain that promotes variability in motor movement[1], the result is more consistent motor movements and less variability – *but also a* **reduction** *in motor learning ability.*

The idea being, when songbirds want to learn, they engage in more exploratory singing behavior, and when precision is called for, they perform in a narrower range.

## Does this apply to people too?

A [team of Harvard researchers](#) were curious about these observations, and wondered if motor movement variability in the early stages of learning might help to explain why some people learn faster than others.

To test this, they devised an experiment in which participants had to learn how to copy a curved figure without being able to see their hand. At first, everyone was off target, but some folks' drawings were more irregular than others.

As they went through hundreds of training trials, everyone's accuracy improved. However, the people who started off with the most erratic performance, learned how to draw accurate curves more quickly than the folks whose initial performance was more consistent.

Then, the researchers did a follow-up study to *deliberately* increase variability (or "error") by nudging their hands off course. Interestingly enough, this forced variability also led to faster learning of the correct motion.

How can it be that more "mistakes" in the early stages of learning a skill seem to predict faster learning?

## Remember Battleship?

I think it's a bit like playing the classic board game Battleship.

One way to play is to call out coordinates in a very consistent pattern – like in consecutive squares from left to right across the middle of the board. But that's no good if all of the ships are concentrated along the bottom or top. A more effective, but random-looking strategy is to take a bunch of shots all across the playing grid, and when you get a hit, *then* focus your efforts in a more concentrated area.

## Why it's so difficult to play something twice in exactly the same way

Part of the challenge of learning and executing any complex motor skill is that much like [Starbucks' 87,000 different drink combinations](#), there are an almost infinite combination of ways in which we can execute a skill and still get the desired result.

For instance, let's take a shift from an octave in 1st position to an octave in 5th position. I could probably nail the shift with the scroll of my violin lifted 5 degrees above horizontal. Or 3.2 degrees below horizontal. Angled 30 degrees to the right. Or starting angled 30 degrees to the right but flattening out to 12 degrees as I make the shift. Then there's finger pressure variations, shape of my hand, position of my elbow,

amount of pressure between chin and chinrest, wiggles of vibrato, and the arching of my left eyebrow and scrunching of my nose. And that's before we even consider what's going on with the right side of my body. All of which could change depending on the exact tempo I'm playing at, the adjustments necessary because of acoustics, what the pianist is doing, how tight my hands and muscles may be at that moment, the sweatiness or stickiness of my left hand, and the restrictiveness of the shirt/coat I'm wearing.

Of course, some of these combinations are going to be more optimal, and result in more consistently accurate shifts. But if I've never had to shift in octaves before, I may not know what combination of ingredients works best.

So it makes sense that in the early stages of learning this tricky shift, exploring a wide range of different combinations of strategies would probably lead me to the best solution faster than only experimenting in a narrow and more restricted range of possible solutions.

## Take action

Of course, some of the early inconsistencies in our playing will be regular old errors, mistakes, blunders, and bloopers. But variability and "errors" that are more *exploratory* in nature – that represents an effort to experiment and test out the full range of ways in which you could accomplish the task – could actually be very productive.

So even if we miss, this doesn't necessarily mean that we didn't learn something. We just learned which combination of ingredients don't work. Allowing us to narrow down the options and get us closer to the exact elements that are most essential, and in what combination they work best.

So especially in the early stages of a skill, don't worry too much about getting everything exactly right and maximizing consistency from the very first try if that comes at the expense of trying different approaches. Experiment. Explore a full range of possibilities. And give yourself a break if your results are a little more variable at first. So long as you are thinking and trying new things (as opposed to mindlessly hacking away at things on autopilot), you'll figure it out eventually and likely be better off for having taken the more scenic route.

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