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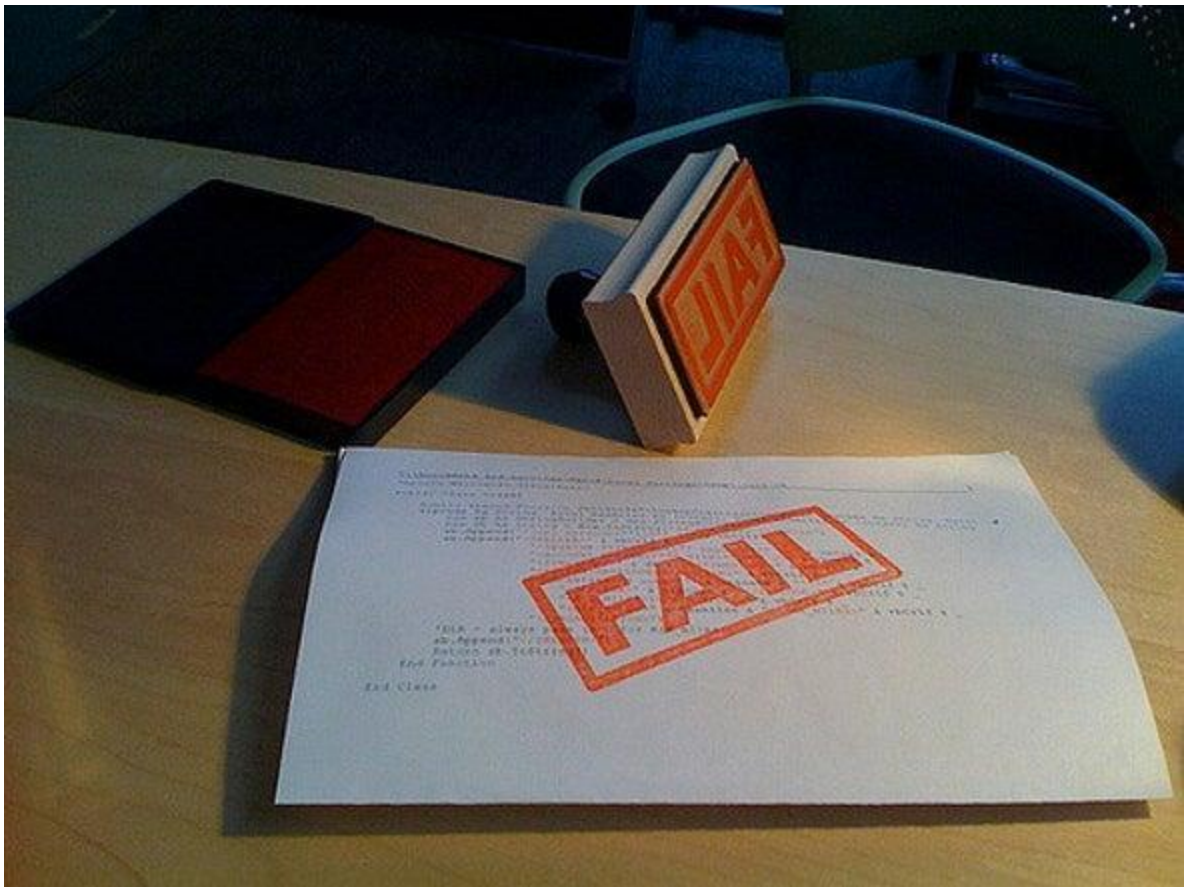
Failure in Science Is Frequent and Inevitable--and We Should Talk More about It

There's nothing glamorous about a dead end. But that doesn't mean we should bury them



Credit: Hans Gerwitz/Flickr

Science has an inside secret: we fail all the time.

I first met major failure in my third year of graduate school when I discovered my entire thesis project hinged on an experimental anomaly. Early on, I had stumbled on a single, promising finding that could have meant the end of neurodegenerative disease. But try as I might, I could not reproduce that result. Instead, I had uncovered an unanticipated, uninterpretable quirk of experimental design. I was chasing a false lead.

The first encounter with failure is a formative moment in every young scientist's training. That moment opened my eyes to the relentless troubleshooting and mystifying anomalies that make up the bulk of the scientific endeavor. But that moment came when I was already deep in the trenches of my graduate career. Sure, I had been warned that failure would find me, that it was the norm, that science proceeds in fits and starts. Those warnings, however, lacked weight without any real protagonists or stakes.

Scientists seldom speak of false starts. While we all have stories about failure, the scientific narrative is dominated by bold questions that begat experimental triumphs that fill textbooks and TED Talks. If failure is mentioned, it is only in the past tense, listed as a steppingstone to discovery. The big, heroic failures that make it to the public stage are really successes in disguise. Failure with purpose. There's even a book about it. But mediocre failures—the mistakes and errors that lead to nothing—have no place.

There's nothing glamorous about a dead end. But does that mean we should bury them? Nearly everything that happens in the lab will never make it to print. *The Journal for the Banal Failures and Self Doubt that Face Day-to-Day Life in the Lab* does not exist. So a huge chunk of science goes unreported. Without failure, we lack a complete picture of science. And, a bigger shame, we lack a complete picture of the scientist beyond the brainy stereotype.

My first brush with failure conjured up a curious combination of emotions: I was anxious to plough forward and paralyzed by fear of further foundering. That emotional cocktail compelled me to investigate the many forms humdrum failure takes and the effects its casualties feel. I wanted to understand how we as a community cope with frequent failure and continue. I wanted to know I wasn't alone.

So I created a home for humdrum failures. I launched an open-yet-anonymous forum for scientists to confess the false starts and true frustrations, humorous mishaps and serious doubts that come with the practice of science. Part therapy. Part catalogue. A complete picture of banal failure.

And so Science Confessionals was born. And so it flopped.

Despite an initial flood of support, Science Confessionals never gained traction. Friends shared it with friends, acquaintances messaged with thanks, strangers Tweeted with praise. But hardly anyone confessed.

This outright failure baffled me since, in science, failure abounds. Newly anointed with disappointment, however, I was not satisfied to let it rest. I confronted friends who had shared the website, most of whom had not posted. When I asked why, the overwhelming response was: "I didn't think my failings were good enough to share."

The take home message: feeling ill-equipped to confess their struggles, my peers continued to bury their burdens. Some were worried they were whining. Others didn't even know where to begin. They believed the quality of their trials and tribulations must mirror the prim and polished narratives they shared with the world.

I should have known. The prevailing culture in science urges us to do all things with intention and innovation. So if we are to fail or feel frustration, we must do so with novelty—preferably with a dash of panache. The struggle must mean something.

But a scientist's own personal relationship to failure evolves uniquely. To be a scientist requires resilience to unrelenting, unromantic failure. The pursuit of science hinges on the brazen presumption that we mere mortals can uncover the secrets of the universe. When we dare to devote our lives to educated stabs in the dark, science is bound to humble us. And so, the scientist must adapt or perish.

With time, we acquire a Teflon coating that is fortified with every trip around an experimental cul-de-sac. Building that resilience to failure is embedded in our training. But it's a lesson we rarely see coming and often must learn alone.

Struggle and defeat of unheroic proportions underscore the devotion and tenacity ingrained in the scientist. Not the glory. We accept that struggle because we love what we do. Because it feels worth the struggle. Or because we revel in self-abuse. Either way, our unexceptional failures make us interesting.

Within the current culture of science, that evolution is largely left unchronicled and undiscussed. By abstaining from talk of failure and our feelings about it, we withhold a considerable chunk of what it

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means to do science. Plus, there's solidarity in shared struggle. If we're destined to fail and fail often, why not also fail openly and fail together?

Only by failing yet again did I grasp what we lose by burying all our failures: a more complete, compelling, communal narrative of progress told through the lens of frequent and fortifying defeat.

This is my confession.

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