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As told to Miriam Garcia, 2092 words.

Tags: Science, Dance, Writing, Failure, Success.

On competition and failure

Cognitive neuroscientist, writer, and dancer Fernanda Perez-Gay Juárez discusses understanding purpose in a different way, learning all the possible paths, and why artists are like neurologists.

You are a doctor that studies cognitive neuroscientist. You are also a dancer. I'm curious to know what's your morning routine?

I'm trying to establish one. I wake up, I do a short yoga workout like 15 to 30 minutes. Then I have breakfast. I read or something, or scroll on social media, just mind wander a little bit, and then I try to sit down and work for around two hours. I wouldn't say I am ultra disciplined, but I try not to get immediately from bed to work.

What's the most fascinating thing that you have learned about the relationship between brain functioning and artistic practices?

There are many things that I've discovered and I've been really astonished by. One would be within the links between dance and neuroscience, there are two things that are going on when you dance. One has to do with what we call mirror neurons that are neurons that help you imitate other movements. So there are neurons that fire when you do a movement, but also when you see someone doing a movement.

There are visual and social elements because you're looking at other people moving and you will move with them. So a part of understanding others is seeing them move, it's about interpreting their movement. Mirroring yourself in others as a way of connecting with other dancers is something that I find very interesting and fascinating. The other thing is that there is evidence that shows that dance helps you better connect with your inner states with something called interoception. How your viscera are doing, your hormonal state, from your organs to the brain, but normally we don't make them conscious. There's evidence showing that through dance, you can better connect and perceive your inner states, and this is important because it connects you to your emotions and it can help you to make better decisions.

Also, there are studies that were done in cinema, in so-called neurocinematics, showing that through cinematic techniques, similar to graphic techniques, movie directors can control our brain activity. There are authors suggesting that one of the main characteristics of art is that artists have perfected techniques to manipulate our attention, to make us look where they want us to look. To make us process what they want us to process, which I find very interesting because it shows how attention is related to consciousness. Whatever we're conscious of and whatever goes into our processing modules of the brain

depends on what we attend to.

I think that was one of the key discoveries of my literature research. This is not my work but through the work of others, which is that art is about getting us to look at. Creating anticipation and manipulating a little bit. That's why one of the pioneers of neuroaesthetics who's name is Semir Zeki, said that artists are somehow studying the brain. That artists are neurologists without knowing it because they know how to play with the activity of the brain.

Is there such a thing as talent or is it something that is built and motivated based on our environment, genetics, and more importantly, on practice?

I don't think there's an answer coming from neuroscience really because talent is such a broad term. There is a construct in cognitive psychology and cognitive neuroscience about general intelligence. Intelligence is understood as the capacity of problem-solving and the capacity of innovation, but intelligence is not necessarily linked to talent. Talent is perceived as something more particular. Talent as at dancing or painting, or solving mathematical equations. So, in that sense, there is an interaction between genetics and environment and it can be pretty multi-dimensional and different in every case. And interesting questions arise like, can we find a neurological correlation of talent or of genius? And I don't think there is such a thing. It's very hard to measure talent. So how do you measure it? You measure it based on the output. But how do you judge someone who has talent? It can be subjective. It's hard to discern if this is to genetics or to early exposure. Early exposure within a child's life is very important to develop their brains because there's this thing called critical periods in the brain in which your brain is particularly plastic, particularly open to create new connections depending on what you're stimulated with.

So maybe a mix of a little bit of genetics, early stimulation in life, perseverance, and training. We know that learning itself does not generate talent so there has to be something else, but of course, it does affect the final output of whatever you are creating. That is what the external world will judge as if you're talented or not. I would say it's something multi-dimensional, it implies genetics, learning, and early life experiences. And by early I mean really early, like right before four years of age. I think those experiences you're exposed to when you're very young can prime you to become this or that or get some kind of skills that later in life you can manifest this talent.

Here at The Creative Independent, we often cover the topic of failure, for example, how does it feel when you create something and it is not received well. And while I was thinking about how to approach this topic with you, I realized that failure might be a purely human condition, am I right?

In order to fail, you would have to have a goal. And other animals have goals, but the goals are very short-ended. "I want to get this partner of the opposite sex to mate with me. I want to get to the water or get somewhere." It is about survival or essential things. If we're talking about failure where you put out a creative output and it did not receive the recognition that you expected, then I don't think that's something that's present in other species because other species never have this goal of putting something out there just for putting it out there. Failure in its human form, it's related to complex activities. To activities that are transforming whatever you have outside and it's the failure of the work itself. I could also make a parallel in science. Science is about failure all the time. Failed experiments from the most basic part in which you needed to put two drops and you put three drops and then you have to do it all over again. Failed results, you had a hypothesis, and you wanted to prove your hypothesis and then after gathering a lot of data, you realize that your hypothesis is not supported. So that's another step of failure. Failure when it comes to publication. You did your experiment, you prove your hypothesis and you write it up and you send it to a paper and they reject it. So I do think it's human and I think in every sector of your professional life, you experience it differently, but it's something that's common to all of us. I think we should be more straightforward with our failures. We tend to share our successes and not our failures, which is not helpful at all for other members of our species or society.

There's also this idea of competition that's behind failure. Because it has to do with recognition as well, If your goal was to create the projector to create the artwork in itself, there would be no failure because you did it, you created it, it's there. But then if you wrote a novel and then if no one read it, you consider it a failure. So I think it really speaks to our need for recognition that can be linked to why we need recognition. Well, because it goes back to our basic survival needs. Because recognition will

give us money to eat, or it will attract the attention of potential mates. So maybe we're not that different from other species in that sense.

Have you seen the film "Soul"? I was listening to a podcast episode of NPR Fresh Air with Peter Docter, who co-wrote and co-directed the film with Kemp Powers, and both of them had this breaking point on exploration on finding the difference between purpose and passion. In your view, what's the difference and how do we experience them? I'm wondering if it's important to demystify this idea of life purpose since this will allow us to experience failure in a different way, or to be more open to exploring another kind of practices, or even if this idea of life purpose brings us any good.

I agree with the idea of demystifying purpose or the true call. We've been educated in this paradigm in which some people have a true call and since forever they knew they wanted to be a doctor and that works for some people.

But for a big percentage of us, that's not the case. We don't exactly know what or who we want to be. So there's this other concept that could tie it up in neuroscience, in animal neurosciences, and in animal studies in which they compare what they call exploitative behavior and exploratory behavior. So exploitative behavior is whatever you do to get from point A to point B. So, "I need to pull this lever because when I pull this lever I'm going to get food." Animals do that. If you train them and they know that you have to put the lever then that's everything they will do, and everything they do it's going to be directed towards that.

Then there's another part, which is the exploratory behavior. Which is the part that they don't know what they have to do to get food, and they go through the cages or the labyrinths, or whatever just exploring, just seeing what they find. And the end result is that you're going to have a different type of learning. Maybe it's not going to be as fast to pull the lever and get your food but you're going to discover other paths in the labyrinth when you're a rat in a lab. I sometimes like to use these metaphors because I think that's the case.

If you think you have a final purpose and you're going to do everything to get to this purpose, that's fine, but you're also going to lose all the richness in exploratory behavior which is, "Well, maybe I don't know what's point B is, I don't know where I'm going to, but it's going to be so enriching to go through all the learning and see all the possible paths."

So I think that socially, it's important to demystify this idea that you have to have a true call and you have to have a purpose. You can have a purpose without a concrete goal to reach. Your purpose is to live and to discover and to learn, and that may change the idea you have of failure because if you are engaging in exploratory behavior, you may get to point B, but in the meantime, you'll learn a lot of things and this is what has value, everything that we learned, that we explore and we discover. Maybe I didn't get to point B, but I learned all other types of alternative paths, and in each fraction of the path that I stopped and learned something new is valuable in itself.

I think that's something that the movie shows, maybe the purpose is that. Just being, just learning, just sharing, just exploring. And I think as you say, art it's very prevalent. It is in science too. You have to be the big scientist and you have to make the big discovery and if you don't, then everything was worthless. We do have to change this mindset because for most of us, it's not going to be the case that we're going to have this particular goal and we're going to reach it and then we're going live happy ever after. So, we better learn to understand the purpose in a different way. All the discoveries that you're going to have throughout your everyday journey.

Fernanda Pérez-Gay Juárez Recommends:

Luedji Luna's music

Siri Hustvedt - *Memories of the Future*

The Convergence Initiative

birdwatching

Name

Fernanda Perez-Gay Juárez

Vocation

Cognitive neuroscientist, science communicator, writer, dancer

Fact

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