Why Psychology? The Cosmic View

Jason R. Finley

Dr. Jason R. Finley comprises a small self-aware subset of totality. He is a cognitive psychologist who studies memory, metacognition, and technology. He finds existence both fascinating and absurd. And he's here to tell you that the day you stop learning is the day you die.

In the Beginning…

> *"We shall not cease from exploration*
> *And the end of all our exploring*
> *Will be to arrive where we started*
> *And know the place for the first time."*
> *~T.S. Eliot*

Human reader, let me tell you the story of how you and I got here.

Over 13 billion years ago, our universe began in a massive explosion. At first things were pretty wild, but simple. Tiny particles and radiation just blasting all over the place, matter and antimatter annihilating each other left and right. Fortunately for our sake, there ended up being a little more matter than anti-, and what was left over started forming full-on atoms: hydrogen and helium. Eventually, enormous globs of those atoms coalesced into countless STARS—giant nuclear fireballs that brought light to our realm.

And those stars, in turn, clustered into countless galaxies. GALAXIES you guys. Beautiful massive spirals and other shapes. So many of them that I've run out of adjectives. If you've never done it before, go somewhere dark, REALLY dark, with clear skies, far away from

the light of cities, and you can see a faint band of light spilled like milk across the whole sky. That's the rest of our galaxy, the Milky Way, seen edge-on. We're pretty far out toward the rim.

Anyway, some time after the galaxies formed, the first stars got old and fat and exploded, spewing out the heavier elements, including our good friends carbon, oxygen, and nitrogen. In time these clouds of blown-up dead star debris coalesced into NEW stars, like our sun, and some of these new stars even had enough leftover chunks of crud circling around them to form into PLANETS. Like marbles of gas and stone whirling around a candle flame in the darkness of empty space. Out of the countless planets orbiting countless stars clumped into countless galaxies, one of those tiny little rocky spheres was our home in space, Earth.

I'm not gonna lie, Earth was a hellscape at first. Just getting absolutely hammered by asteroids and crap, like nonstop (Jakosky, 1998). See how pockmarked the moon is? Yeah, it was like year-round armageddon for a while. Ridiculously hot too; we're talking molten lava as far as the eye could see. Except there weren't any eyes yet.

But get this: just about as soon as the solar system settled down enough to stop bombarding Earth (we can thank the gas giants for helping out with that) and liquid water appeared on the surface (some of it from comets!), something truly awesome happened. The right combination of molecules and the right infusion of energy were in the right place at the right time, and what emerged was a molecule that could make copies of itself. It was probably RNA at first, with DNA to come later; we're still not sure (Orgel, 1998). But the point is: a SELF-REPLICATING molecule! It might seem improbable, and maybe it was—but it only had to happen once. LIFE!!!

Not just life, but three key ingredients: self-replication, variation across generations (due to mutations and eventually SEX), and differential survival (some organisms thrived and multiplied in the environment, while a bunch of other poor chumps didn't). Put those together and you get EVOLUTION BY NATURAL SELECTION, the most incredibly amazing process we've ever discovered. And it's been going on for a really, REALLY long time. We've got ancient fossils from Australia showing simple microbes dating as far back as 3.5 BILLION years (Schopf, 1993). Over those many eons, life exploded and flourished into countless species, running totally amok across the skies and oceans and lands of Earth. I think old Chucky D said it best himself:

"Probably all organic beings which have ever lived on this earth have descended from some one primordial form, into which life was first breathed. There is grandeur in this view of life that, whilst this planet has gone cycling on according to the fixed law of gravity, from so simple a beginning endless forms most beautiful and most wonderful have been, and are being evolved."
~Charles Darwin

Sentient Matter!

Those endless forms of life on Earth included, eventually, a curious and social mammal with a proclivity for tools and language. Human beings! We sure took our sweet time getting our acts together though. Our ancestors were roving bands of hunter-gatherers for something like two hundred thousand years. Across those long ages, their stories now lost to time, our ancestors yearned and struggled. They lived lives full of the same kind of love and hate and joy and sorrow that you and I know. They probably also laughed at fart jokes, because what's more human than that? At any rate, along their long way into the future, our ancestors also developed greater and greater TOOLS, for we have always been the species that extends itself into the environment, that shapes tools to transcend our limitations (Finley et al., 2018). Eventually, we invented agriculture (~10,000 years ago), then written language (~5,000 years ago), and then SCIENCE (~400 years ago). Human life, and even life on the rest of this planet, has changed so much in just the last 100 years, for better and/or worse.

And finally, here you are reading this right now. You are made out of starstuff. Your atoms were formed in the nuclear cores of ancient stars. You are a vast and intricate assemblage of matter that is SELF-AWARE. You are literally the eyes of the universe looking back upon itself. This is amazing. The very fact that you're capable of amazement is amazing!

To be human is to WONDER. Our species has always looked with wonder both outward at the stars and inward at ourselves. We are driven by a need to understand. And the most complex thing we have yet ever encountered in this mad universe is our very selves: THE HUMAN MIND. Your brain is a tremendous chemical computer made out of stardust, with almost as many neurons as there are stars in the galaxy (Voytek, 2013)! Even just thinking about our own minds is mind-blowing!

We all have intuitions about how our minds work, and why people do the things they do. But those intuitions can be wrong, like REALLY wrong (Lilienfeld et al., 2009). But good news my dudes: we can turn the lens of SCIENCE back onto our own minds! PSYCHOLOGY is the science of mind and behavior. Science is a way of knowing, the most powerful one we've ever developed. What you will learn as a psychology major is not only the best of our knowledge about the human mind so far, but how we have come by that knowledge, and how we can continue to expand it.

> *"The fact that we live at the bottom of a deep gravity well, on the surface of a gas covered planet going around a nuclear fireball 90 million miles away and think this to be normal is obviously some indication of how skewed our perspective tends to be."*
> *~Douglas Adams*

Beyond the Horizon…

The way I see it, there are two great frontiers in the scientific endeavor: the existence and distribution of life in the universe (astrobiology; Methot & Finley, 2003) and the mechanisms of mind (psychology; Piaget & Kamii, 1978). That is, outer space and inner space. Both of these frontiers are enormous. The universe is incomprehensibly vast. Even in just our own Milky Way galaxy, how many stars might have habitable planets, and how many of those might have life (Drake, 2014)? If there are currently advanced alien civilizations in our galaxy, why haven't we found any evidence of them yet (the Fermi paradox; Longstaff, 2018)?

Inner space is just as vast. Your mind holds its own limitless worlds of wonders.

> *"[We are] bombarded every second by sensations, emotions, thoughts, which [we] cannot attend to for multitude, and nine-tenths of which [we] must simply ignore. A single second of lived time contains more than can be recorded. The past … in its reality, was a roaring cataract of billions upon billions of such moments: any one of them too complex to grasp in its entirety, and the aggregate beyond all imagination."*
> *~C. S. Lewis*

Inner space and outer space need each other. Your brain was born of the stars. But without living minds such as yours, there would be no way for the cosmos to know itself. There would be no science, no art, and no pizza.

It is even possible that in your lifetime there may be advances and discoveries so stupefying and wondrous that they dwarf everything that's happened so far. There may be answers to great questions, that in turn bring even greater ones.

Will we humans create sentient artificial intelligence? Can we make machines that think like us, or think differently? Will we encounter intelligent life from other stars? Will we go back out into space? Will we explore and colonize other worlds? What's holding us back from doing so? What are the mental and emotional challenges of such endeavors? Will we augment our minds with direct neural interfaces? Will we upload human minds into computers? If, as in the story of the Ship of Theseus, we slowly replaced each neuron in your brain with an artificial replacement, would you still be you? How do we even define intelligence? How would we choose to exist in a diverse sentient milieu? How does matter come to think? How have our human minds been shaped by evolution, by the characteristics of our Earth, and the yellow star it orbits? Do we have free will?

Studying psychology will prepare you for such possible discoveries and questions in a way that no other discipline will. It will equip you to grapple with profound issues based on evidence and logic, not just opinion. There is still so much we don't know, so much to learn. I invite you to join this journey of cosmic self-discovery. And I can absolutely guarantee it won't be boring!

> *"For we are the local embodiment of a Cosmos grown to self-awareness. We have begun at last to wonder about our origins, star stuff contemplating the stars … tracing that long path by which it arrived at consciousness here on the planet Earth and perhaps throughout the cosmos. … Our obligation to survive and flourish is owed not just to ourselves but also to that cosmos, ancient and vast, from which we spring."*
> *~Carl Sagan*

References

Adams, D. (2002). *The salmon of doubt: Hitchhiking the galaxy one last time.* Harmony.

Darwin, C. (1859). *On the origin of species by means of natural selection*.

Drake, N. (2014). How my dad's equation sparked the search for extraterrestrial intelligence. *National Geographic*, *30*.

Eliot, T. S. (1944). Little gidding. Four quartets. *Collected Poems 1909–1962*.

Finley, J. R., Naaz, F., & Goh, F. W. (2018). *Memory and technology: How we use information in the brain and the world*. Springer. doi:10.1007/978-3-319-99169-6

Jakosky, B. (1998). *The search for life on other planets*. Cambridge University Press.

Lewis, C. S. (1967). Historicism. *Christian Reflections*, 100-113.

Lilienfeld, S. O., Lynn, S. J., Ruscio, J., & Beyerstein, B. L. (2009). *50 great myths of popular psychology: Shattering widespread misconceptions about human behavior*. John Wiley & Sons.

Longstaff, R. (2018). Fermi paradox special issue. *Journal of the British Interplanetary Society, 71*(6).

Methot, L. M., & Finley, J. R. (2003). The UCLA AstroBiology Society: the first student-run astrobiology organization. *Astrobiology, 3*(2), 249-250.

Orgel, L. E. (1998). The origin of life—a review of facts and speculations. *Trends in Biochemical Sciences*, *23*(12), 491-495.

Piaget, J., & Kamii, C. (1978). What is psychology? *American Psychologist*, *33*(7), 648.

Sagan, C. (1980). *Cosmos*.

Schopf, J. W. (1993). Microfossils of the Early Archean Apex chert: new evidence of the antiquity of life. *Science*, *260*(5108), 640-646.

Voytek, B. (2013, May 20). Are there really as many neurons in the human brain as stars in the Milky Way? *Brain Metrics*. https://www.nature.com/scitable/blog/brain-metrics/are_there_really_as_many/

This chapter to appear as: Finley, J. R. (2021). Why psychology? The cosmic view. In K. Vaidya (Ed.), *Psychology for the Curious: Why Study Psychology*. The Curious Academic Publishing.