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The Tao of Gen X

Good morning, everyone. It's a pleasure and an honor to be here today to celebrate the achievements of the 2024 graduate class in the biological sciences at the University of Chicago.

My time at UChicago was transformative for me, and I hope it's been for you as well. Graduate school is more than just two or six more years of college. (One thinks, so you enjoyed four years as an undergrad, why not make it a full decade in the university?)

Professors? We can check out anytime we like, but we never leave.

Now, when I started graduate school, I wasn't sure what I wanted to do after graduation. I was open to going into biotech or academia.

This relates to the question that I want to explore today which is, "What does one do with one's life? What comes next?" It's a question that I still ask myself while at the same time I advise students grappling with these decisions. Often this question is posed as do I follow my passion or follow the money?

To go back to my time in graduate school, in the 1990s, I spent a lot of my spare time reading philosophy, psychology and literature. It's a very UChicago thing to do.

The psychologist Carl Jung originated the idea of archetypes that underly our collective unconscious. Everyone wants to be loved, to have purpose and to have security, and the archetypes reflect these needs. Since everyone has these archetypes, hardwired by evolution, they are a shared structure of our unconscious minds.

Jung believed that archetypes are reflected in mythologies. This idea was later popularized by Joseph Campbell, who compared mythologies from different cultures to identify shared underlying themes. The most famous of these themes is the hero's journey.

The original Star Wars is a great example of the hero's journey. In fact, George Lucas was influenced by Campbell's writing. In the hero's journey, the protagonist, Luke in this case, is

called to adventure. He's counseled by a wise man (Obi-Wan Kenobi) and learns about a mystical force. Through a series of trials, Luke rescues the princess, destroys the Death Star and returns a hero.

Arthur C. Brooks, who writes a "happiness" column for the Atlantic Monthly, notes that many people, high achievers in particular, envision their lives in the mode of the hero's journey. In modern society, this journey involves navigating the question of whether to follow your passion or follow the money.

Here's my journey. I grew up in Mississippi. I have a younger sister. My parents divorced when I was six. My mother remarried and worked for the post office. My father worked in law enforcement and then telecommunications. Star Wars premiered when I was in second grade. I worried about nuclear war with the Soviet Union. In the early eighties, I watched a lot of MTV. I've always thought that I had a fairly typical Generation X childhood.

In school, the first class that really excited me, other than art, was 4th grade general science, particularly the biology section. I also had an amazing gifted and talented teacher, and, without her, I wouldn't be here today. Via the gifted program, we competed in a competition called Olympics of the Mind, and one year the national finals were in Michigan. Our team traveled by train through Chicago, and we stopped over to visit the museum of science and industry, not far from here. That was 1983.

Looking back, after we placed first at the national competition, it was amusing to watch the disbelief of the other teams in losing to the team from Mississippi (Like, seriously? Mississippi? The state that's consistently ranked last in everything!). But hey, Mississippi did give us blues and Elvis.

As teen, I realized that I had to get out and see the world. I wanted to go to a big city and the hyper academic ethos of UChicago appealed to me. However, my mother wanted to keep me closer to home, so as a compromise, I went to a small liberal arts college in Mississippi. I had always thought that I would be a surgeon, but I worked in a hospital one summer and didn't like it. So, there I was, about to be a junior in college, and I had the existential quandary of not knowing what I wanted to do with my life.

Luckily, that semester, a new professor arrived at my college with expertise in molecular biology. He was amazing and, without him, I wouldn't be here today. I loved his classes in genetics and molecular biology. I learned from him that I could get paid to do research. This was a revelation! There are no big research universities or biotech firms in Mississippi, so I had never considered a career as a scientist.

While I did learn PCR, which was not common in 1991, I didn't have a lot of undergraduate research experience. However, I did well on the standardized tests and was accepted to UChicago. I later learned that the admissions committee thought that I could be "A diamond in the rough?".

Early graduate school was hard. Two years before I started, the program failed two thirds of the graduate class at qualifying exam and kicked them out of the university. That was definitely not chill. I've had exactly one anxiety attack in my life, and it was in my first year of graduate school. Those years remind me the aphorism, "That which doesn't kill you makes you stronger."

My future PhD advisor, Chip Ferguson had been hired by UChicago but was still finishing his postdoc at Berkeley. In the spring of my first year, he visited campus to present his research to the first-year students as part of a course. He also assigned a paper in his field that would be discussed in the following session of the class. I was captivated by his research and volunteered to lead the discussion to try to impress him. The paper was from Christiane Nüsslein-Volhard's lab which was the top developmental biology lab in the world. I thought the paper was the most amazing that I'd ever read. Chip finally moved to UChicago in October of my second year. I did a short rotation, he didn't even have his lab set-up, and became his first student in December.

I could not have had a better mentor than Chip. It was an exciting time in developmental biology, and we had a great intellectual dialogue about the big questions in the field. In the lab, I had to prep DNA via cesium chloride gradients because Chip didn't trust those new Qiagen columns. I had to do old-school P32 DNA sequencing where you transcribed the auto-rad film by hand into A's, G's, C's and T's. You got maybe 180 bases of sequence per reaction, if it worked, and it frequently didn't. Hey, you've got to pay your dues before you can pay the rent.

But then, my first paper came out and everything changed. It got a write-up on the front page of the life section of USA Today, titled "Common Cord Links Species", next to stories about Michael Jackson and "Lolita with a Violin". I often tell trainees that I didn't get permission to start writing my dissertation until after my second first author paper was published. However, as a concession, Chip let me start looking for postdocs after the first paper came out. So, in September of 1995, I wrote to Christiane Nüsslein-Volhard to inquire about doing a postdoc in her lab. Two weeks later, she won the Nobel Prize.

I joined her lab in April of 1997. She was at the Max Planck Institute for Entwicklungsbiologie in Tübingen, Germany. The Max Planck Institutes are the elite research institutes in Europe. Tübingen is a little university town in southwest Germany, about half an hour east of the black forest and ninety minutes north of the Swiss border. Tübingen wasn't bombed in the war so the town center still has its medieval charm of cobblestone streets and Tudor-style buildings. In the castle in the center of town, Friedrich Miescher first isolated DNA in 1890s. I loved my time in

Tübingen, and my postdoc was the least stressful part of my career. I met my wife there, got to travel extensively throughout Europe and became reasonably proficient in German. However, my American accent was so strong, that after speaking about two words in German, many would just reply to me in English.

By the time I finished graduate school, I had decided on a career in academia. In 2002, after a five-year postdoc, I started my faculty position at Yale. Being an assistant professor was a hard transition, because you're no longer a bench scientist, you're a manager, and we don't receive a lot of training to be a manager. It's sink or swim. One of the two people hired the year before me and the two faculty hired after me weren't promoted. Much of the 2000s are a blur to me. Fast forward to today, and I'm department chair and often tasked with giving career advice.

So, I've just told you how I came to be at this podium today. What lessons can I pass on, one UChicago grad to another?

I have two pieces of advice about science. The first is always follow the data. Your hypothesis may be clever, but the data are real. Second, is stay adventurous. Future advances in technology will enable you to ask questions that are impossible to ask today. Strive to be at the cutting edge.

But what about the life dilemma. Do you follow your passion, or do you follow the money? I posit that this question is a modern-day archetypal travail along the hero's journey. It is a privilege of living in a prosperous modern society to have this choice. But having this freedom, truly having the choice of what to do with your life, is to be what existentialists call "condemned to be free".

In the popular press, this choice is often framed as the question of choosing a college major? Humanities or STEM? Whether your parents will admit it or not, they were probably relieved when they learned that you wanted to study biology rather than philosophy. You may laugh. But note, I'm a STEM professor who just quoted Friedrich Nietzsche and Jean-Paul Sartre.

So you chose STEM, but now what?

A couple of years ago, I had an undergraduate student wrestling with this choice. She had won a game show as a teen and used the prize money to pay for much of her tuition at Yale. She was studying biomedical engineering and considering medical school, but what she really wanted to do was be on Broadway. She wanted to write and perform. She was smart and had charisma to spare so maybe she could make it. Who knows? But her family couldn't afford to support her to live in New York while she tried to break-through.

So, do you follow your passion or follow the money? I advised her that she has to make that choice for herself because she will live the consequences of that decision. This is important: you have to own your freedom and your choices.

Try to be authentic to yourself. But realize predictions are hard, especially about the future. You will imagine the idealized life that awaits in a specific job or career choice. However, reality rarely lives-up to that idealized vision. This doesn't necessarily mean that you made the wrong choice.

In 2010, my wife and I went on vacation to Maui. We stayed at a bed and breakfast on the north shore of the island that was owned by a woman who had recently retired from working in finance. I told her that I was a professor at Yale, and she started to wistfully remark how satisfying that must be. To interact with smart students and do research. She did note that there was probably some unpleasant bureaucracy to deal with but..."it still sounds amazing." Meanwhile, I was thinking, hmmm work at Goldman Sachs, retire at 50, buy a house in Hawaii...sounds pretty sweet. Is the grass greener on the other side of the fence? Maybe. Or maybe the dream is better than the reality.

If you had told me during my first year of graduate school that I would become a Professor and Department Chair at Yale, that I would get to teach amazing students and do intellectually challenging research. I would have been like "awesome dude!" I realize all of this. But I still complain.

Grant proposals get rejected, manuscripts get rejected, and I have to deal with all manner of academic committees who, like Mr. Smith in the Matrix, keep proliferating in number and are always getting into my inbox!

My therapist is paid to listen to my angst. But even he's sometimes like, "Come on man."

So, on an intellectual level, I admit "life is good." But I don't always FEEL that way. It's hard to maintain a presence and appreciation of the moment. Instead, it's easy to obsess over the past and fret about the future.

In perspective, we're on this earth only briefly. Individually, we all have our flaws, and human societies definitely have their flaws. So, it's wise to not let the perfect be the enemy of the good.

Try to be kind and not judgmental, both to yourself and to others. I often have trouble following this advice, but it is a worthy objective.

Most commencement speeches urge to you to follow your passion. But no one lives life always following their passion. Sometimes, we need to make compromises for family or unexpected events. Even hedonists sometimes need to get back to work.

In the end, this archetypal question, follow your passion or follow the money, is not a single choice but series of choices that we continually make. Sometimes you choose one, sometimes the other. They are yin and yang. So, I guess I am recommending a type of balance. Be authentic to yourself but also be pragmatic. I think of this as the Tao of Gen X.

So congratulations again! You all now have a graduate degree from one of the most esteemed universities in the world. You're young and life's possibilities await. So carpe diem, but don't forget to save for retirement.