

## Module 2 Transcript

### Nature, Nurture & Genetics

“Where am I, or what? From what causes do I derive my existence, and to what condition shall I return?” -David Hume

What are you? It's not just a hypothetical thought experiment. As a person, are *you* a collection of genes, dealt out to you in advance of your birth--a set of instructions following itself? Or are *you* built by experiences, by environment, by choice? By outside factors each playing a role in what your identity is, how you think, how you feel? Or, is it something more complex, a combination of both? Well, it turns out that it is both. There is this beautiful dance going on for all of us between our genes and our environment.

DNA, chromosomes, genetics. Passed down from generation to generation, these tiny structures contain everything needed to create the human body and mind. Sort of. We understand there are certain gene variants, often tied to different neurotransmitters or receptors, that can increase a person's likelihood of developing depression or anxiety.

Take, for example, the MTHFR Gene. It stands for methylenetetrahydrofolate reductase, but for obvious reasons, we'll stick to the acronym. A mutation on the MTHFR gene has attracted a great deal of attention recently, having now been linked to symptoms consistent with both depression and anxiety.

And things like family history are powerful tools in therapy and in self-understanding. But for some, this can be a discouraging prospect.

I had a patient who had been diagnosed with depression as a teenager. He'd been taking an antidepressant medication for a number of years, but it didn't seem to be working as well for him anymore. Understandably, that was very frustrating. Importantly, he wasn't the only person in his family to have dealt with depressive episodes, either. He worried at

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times that, thanks to that family history, his brain was somehow “broken,” and his genes meant that he’d always be struggling with these feelings of sadness and decreased motivation.

This isn’t uncommon. Those who struggle with depression and anxiety often feel like they’ve been dealt a bad hand when it comes to their genes. I would argue that for too many years, we’ve looked to our DNA in terms of our health destiny. When I was finishing medical school nearly twenty years ago, we believed that an individual’s genes strictly determined everything from intelligence to behavior. The core message for many people was that our genomes are solely responsible for how our bodies and brains grow, mature, and function. And whatever configuration of genes you happened to be born with was all you had, and would ever have, to work with.

But one of the most exciting and empowering concepts to emerge in the last 20 years is the field of epigenetics, or the study of how our environments and lifestyle decisions can change how our genes are expressed. Epigenetics shows us that our genetic destiny is much more malleable than we ever imagined. Epigenetic changes can quite literally change how the body reads DNA sequences, what genes get turned on and expressed and what genes get turned off and silenced.

An easy way to conceptualize epigenetics is to think of your genome as a desktop computer. You were born with your genome, made up of all the DNA passed to you by your mother and your father, with a few mutations or tweaks in your genes thrown in along the way. There may be a few genes that predispose you to depression or anxiety. But, as with your computer, the hardware needs software to tell it what to do. The epigenome, or those environmental tweaks to gene expression, is that software. Your life experiences, as well as lifestyle factors like diet, exercise, and social interactions, are actually modulating your DNA—and telling your genome to increase, decrease, or even stop production of different proteins in response to your environment. It’s complex, of course—but what we see is that,

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even with a strong family history of a particular mental health condition, nothing is set in stone. The epigenome means that you have the power to make changes, like to your diet, And that you can counter genes that you may have inherited that put you at risk. Is that making sense?

It's a bit complicated but another way I like to think about it is playing poker. You get dealt your genetic hand, but have you ever played poker with someone who's really good? It seems that no matter what hand they are dealt, they always seem to win. Really, this course is designed to help you be better at playing the cards you are dealt not matter what they were.

So what does this mean in practical terms? It might sound grandiose but this course is designed to help improve the expression of your genes to optimize your mental fitness and improve your mental health.

We're going to look at nutrition, which new science tells us can influence how our brains function and even help our brains grow. In this course we are going to root out environmental factors that we know have negative effects on mood and increase anxiety and rob us of our mental fitness. And beyond what the latest research tells us about nutrition, exercise and sleep, we'll distill the most important findings from modern psychotherapy and mindfulness research.

It's all of these elements, when combined with our genetic makeup, that create our unique, individual mental state and the trajectory of our mental health and mental fitness. Instead of looking at the brain in terms of predestined wiring or a blank slate, perhaps it is best to fully appreciate the infinite complexity that arises from the juxtaposition of the two. And by doing this, we can set the stage to truly begin to understand mental health and the actions we each must take in our daily lives to optimize our mental fitness and to enhance the power of our modern brains.