

# Cracking the Curiosity Code

*The Key to Unlocking Human  
Potential*

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## *Chapter 6*

# **Curiosity and Intelligence**

Curiosity and creativity are intelligence having fun.  
Albert Einstein

Were Leonardo da Vinci or Albert Einstein born brilliant, or did they acquire their intelligence because they were extremely curious? Are curious people naturally intelligent? Are smart people naturally curious? What, if any, is the correlation between intelligence and curiosity?

These are the questions that I confronted on this topic. So, as is my tendency, I went back to the beginning, aided by earlier work I'd done when studying intelligence and emotional intelligence during my doctoral studies. However, I knew there was more to learn in answering these questions.

For starters, here's what we know.

The words "intelligent," "intelligence," and "IQ" are as common to us as the words "smart," "genius," or "brilliant." Since childhood, it's been instilled in us that we're either smart or not smart.

Later in school, we took IQ exams to measure and prove just how smart we are. The words took on a social connotation, and in some instances, a social stigma. They could be an enabler or source of encouragement and motivation. Or they could serve as a barrier or inhibitor to what we could or could not accomplish in life.

Once the judgment of "not very smart" is bestowed upon someone, the expectations are automatically lowered for that individual, consciously or subconsciously. At one point in his life, Einstein was deemed not very smart, only to later be classified a genius.

This chapter offers some perspective on those words and assumptions in the context of the workplace and lifetime employability. We begin by briefly looking at the origins of the words and how they evolved to establish the connotations they

have. Then for some, we'll proceed to demolish the assumptions attached to them.

We also look at early studies about intelligence and how our intelligence was viewed to be fixed - that is, unable to be developed or improved. We then examine how recent studies offer a new and different perspective and how one's intelligence can indeed be developed.

Finally, we attempt to put it all together. How can we use and develop those key elements of our intelligence toward the objective of sustaining lifetime employability?

### ***Intelligence and IQ***

Picture your brain forming new connections as you meet the  
challenge and learn. Keep on going.  
Carol Dweck

Since its early beginnings as the study of human behavior evolved, the term “intelligence” migrated from the realm of philosophy to become a central ingredient in psychology. Today, the study of intelligence has advanced significantly; however, psychologists are still debating its exact definition.

Despite differing views, scientists and behaviorists generally conclude its definition to be: The mental capability to, among other things, reason, plan, solve problems, think abstractly, comprehend complex ideas, learn quickly, and learn from experience.<sup>i</sup>

### ***From Intelligence to IQ***

The term “intelligence quotient” (IQ) as the measure of one's intelligence was coined by a psychologist named William Stern while at the University of Breslau in Germany in 1912. Though

there has been much refinement over the years, the IQ test, its scoring systems, and its standards for administering remain the standard for measuring intelligence.

Tests for IQ are designed not only to assess book learning (a narrow academic skill) or test-taking abilities, but also to assess an individual's broader, deeper comprehension of their surroundings. How well is that person able to understand a situation and effectively solve problems?

From the scoring and testing standards that have evolved, it appears that approximately two-thirds of the population score between 85 and 115; about 2.5 percent score above 130; about 2.5 percent score below 70.

In the earliest studies of intelligence, the subject of IQ was rather binary; a person was either smart or not smart. Since the IQ test was first introduced, intelligence has become more expansive in scope, but beliefs about it have largely remained the same. It was believed the intelligence you are born with is the intelligence you die with. Little could be done to change that fact.

With the IQ test, behavioral scientists continued with that rather simplistic view that intelligence was intelligence, and the IQ test was the measuring standard. You're either smart or not smart, and your IQ score told us how smart. Other attributes such as personality or talents were ancillary by-products of your intelligence. But your intelligence, scientists continued to believe, was a simple, straightforward calculus.

However, in the second half of the twentieth century, those views began to change.

### ***Fluid versus Crystallized Intelligence***

In the 1960s, a British psychologist named Raymond Cattell put forth the proposition that intelligence took two distinct forms. The first is our foundational intelligence. That, Cattell said, equates to our base level knowledge, generally formed through our early learnings and experiences. We learned our ABCs, and we learned that  $2 + 2 = 4$ . We learned that dogs can bite, and bees can sting.

That foundational intelligence, which relies heavily on past knowledge or learnings, is what Cattell referred to as “crystalized” intelligence.

Cattell then introduced a second type of intelligence that equates to our ability to grasp new lessons or new experiences, which he referred to as “fluid” intelligence.

Cattell, along with one of his former students, John Horn, conducted further research and wrote a series of publications on fluid versus crystallized intelligence. Their work changed several earlier beliefs on the subject.

Their work was also instrumental in destroying another earlier theory that intelligence could not be developed. That belief was dramatically changed when they conducted a variety of studies demonstrating that fluid intelligence could indeed be developed.

Those studies put the subject of intelligence in a brand-new light.

### ***Types of Intelligence***

To take the analysis of intelligence a step further, in the 1980s, a psychologist named Howard Gardner led a series of studies to examine other elements of our intellect. He studied things such as talents and special abilities, which were traditionally viewed as traits ancillary to intelligence. He determined that those traits were different forms of intelligence.

Just because someone is not good at math, Gardner concluded, it doesn't mean that person isn't intelligent. Intelligence comes in different forms or specialties, he said. In 1983, he wrote of nine different types of intelligence, including elements now associated with emotional intelligence, such as interpersonal and intrapersonal intelligence.

With Gardner's work, the concept of intelligence was no longer binary; it was multidimensional. To add to the topic's growing complexity, scientists began to dissect the IQ test itself, to look at the true measure and behavioral meaning of one's level of intelligence. If someone is regarded as smart, what differentiates that person from someone who's regarded as *really* smart?

### ***Building Blocks of Intelligence***

Considering that intelligence is multidimensional, are there elements that underlie or support all types of intelligence?

Let's get to the question at hand: what is the correlation between intelligence and curiosity, your IQ and your CQ (curiosity quotient)?

Having intelligence is clearly important to academic performance. But, like so many other ingredients for achieving success in life, intelligence is necessary but not sufficient.

Everyone knows of a brilliant kid who failed school or someone with mediocre smarts who made up for it with hard work. That's why research psychologists are looking at factors other than intelligence that make some students do better than others.

One element is conscientiousness, that is, the inclination to go to class and do the required homework. People who score high on this personality trait tend to do well in school.

Sophie von Stumm from the University of Edinburgh in the UK is coauthor of “The Hungry Mind: Intellectual Curiosity Is the Third Pillar of Academic Performance.”<sup>ii</sup> She stated, “It’s not a huge surprise, if you think of it, that hard work would be a predictor of academic performance.”

von Stumm and her coauthors concluded that curiosity is another important factor. “Curiosity is basically a hunger for exploration,” stated von Stumm. “If you’re intellectually curious, you’ll go home, you’ll read the books. If you’re perceptually curious, you might go traveling to foreign countries and try different foods.”<sup>iii</sup> Both of these could help students do better in school.

The researchers performed a meta-analysis, gathering the data from about 200 studies totaling about 50,000 students. They found that curiosity did, indeed, influence academic performance. In fact, it had quite a large effect, about the same as conscientiousness.

Combined, conscientiousness and curiosity had as big an effect on performance as intelligence. von Stumm wasn’t surprised that curiosity was so important. She explained, “I’m a strong believer in the importance of a hungry mind for achievement, so I was just glad to finally have a good piece of evidence. Teachers have a great opportunity to inspire curiosity in their students, to make them engaged and independent learners. That is very important.”<sup>iv</sup>



Employers may also want to take note. A curious person who likes to read books, travel the world, and go to museums may also enjoy and engage in learning new tasks on the job.

“It’s easy to hire someone who has done the job before and, hence, knows how to work the role,” von Stumm said. “But it’s far more interesting to identify those people who have the greatest potential for development, the curious ones.”<sup>v</sup>

Don’t just teach your children to read. Teach them to question  
what they read.  
George Carlin

Abraham Maslow, the famed psychologist who was best known for creating Maslow’s hierarchy of needs and the concept of self-actualization, stated that “Fear of knowledge . . . is a protection of our self-esteem, of our love and respect for ourselves.”<sup>vi</sup>

If we can learn a love for knowledge, we can grow and learn to love ourselves and, with courage, love and master our environments. Therefore, parents should be shown the positive effects of supporting their children’s curiosity and how to best do so. School curricula could first focus on teaching kids an intrinsic desire to know before feeding them facts.

The authors of a 2011 study published in *Perspectives in Psychological Science* found that curiosity is a big part of academic performance.<sup>vii</sup> According to the study, personality traits such as curiosity seem to be as important as intelligence in determining how well students do in school. In fact, as Einstein said, “Curiosity is more important than intelligence.”

In another study, scientists from the Samuel Lunenfeld Research Institute of Mount Sinai Hospital in Toronto discovered a molecular link between intelligence and curiosity.

This could lead to the development of drugs that will improve a person's ability to learn.

Dr. John Roder, senior investigator at Lunenfeld-Tanenbaum Research Institute, and Bechara Saab, PhD candidate at Lunenfeld Institute, studied the interaction of two proteins in a small region of the brain called the *dentate gyrus*, part of the hippocampus, which plays a role in long-term memory and spatial navigation. They published a paper on this in 2009 in *Neuron*.

For the study, the neuronal calcium sensor-1 (NCS-1), a protein known to affect the memory of worms, was linked to bipolar disorder and schizophrenia in people. It was increased 150 percent specifically in the dentate gyrus of mouse models. This modest over-expression increased the ability of brain cells to change how they communicate with each other. In effect, it gave the mice superior memory in complex tasks and a significant increase in exploratory behavior (curiosity).

Because the exploratory behavior was only altered in safe environments, the researchers concluded that they had discovered a region of the brain that generates and enhances curiosity. It becomes a model for how brain activity directly leads to curiosity. These researchers also discovered that both curiosity and spatial memory were impaired when blocked by certain drugs.

Wrote Bechara Saab, "Now that we know that some of the molecules and brain regions that control learning and memory also control curiosity, we can go back to the lab and design drugs that may improve cognition in humans. That's the potential benefit for the future. Immediately, however, we can put into use the knowledge that fostering curiosity should also foster intelligence and vice versa."<sup>viii</sup>

So, we now know that curiosity is not the exclusive domain of the intelligent, but curiosity can increase our intelligence. Just ask Einstein.

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<sup>i</sup> <https://en.wikipedia.org/wiki/Intelligence>

<sup>ii</sup> <https://www.sciencedaily.com/releases/2011/10/111027150211.htm>

<sup>iii</sup> S. von Stumm, B. Hell, T. Chamorro-Premuzic. The Hungry Mind: Intellectual Curiosity Is the Third Pillar of Academic Performance. *Perspectives on Psychological Science*, 2011; 6 (6): 574 doi:[10.1177/1745691611421204](https://doi.org/10.1177/1745691611421204)

<sup>iv</sup> Ibid.

<sup>v</sup> Ibid.

<sup>vi</sup> [http://pages.ucsd.edu/~nchristenfeld/Happiness\\_Readings\\_files/Class%207%20-%20Maslow%201954.pdf](http://pages.ucsd.edu/~nchristenfeld/Happiness_Readings_files/Class%207%20-%20Maslow%201954.pdf)

<sup>vii</sup> <https://www.sciencedaily.com/releases/2011/10/111027150211.htm>

<sup>viii</sup> <https://www.newswire.ca/news-releases/canadian-researchers-discover-the-first-ever-link-between-intelligence-andcuriosity-538568832.html>