Mom's Beef Stew: Five Ingredients of Intelligence

by John Medina

The smell of my mother's beef stew simmering in the kitchen on a cold winter's day is easily the best comfort-food memory I have. Mom's stew was like a warm hug in a bowl.

She once marched me into the kitchen to teach me how to make her famous beef stew. This was no easy task as she had the annoying habit of changing the recipe almost every time she made it. "It depends on who's coming over for dinner," Mom would explain, "or whatever we have lying around the house." According to her, only two elements were critical to pull off her masterpiece: the quality of the beef and the gravy surrounding the meat.

Like Mom's stew, human intelligence has two essential components, both fundamentally linked to our evolutionary need to survive.

The first is the ability to record information, called "crystallized intelligence." The second component is the capacity to adapt that information to unique situations by reasoning and problem solving, called "fluid intelligence."

In other words, we as humans have the ability to learn rapidly from our mistakes and the ability to apply that learning in unique combinations to our ever-changing world. Intelligence, seen through this evolutionary lens, is simply the ability to do these activities better than someone else.

Mandatory as memory and fluid intelligence are, though, they are not the entire recipe for human smarts. Many ingredients make up the human intelligence stew, and I'd like to describe five that I think you would do well to consider as you contemplate the intellectual gifts of the children in your care. They are:

- desire to explore.
- self-control.
- creativity.
- verbal communication.
- interpreting nonverbal communication.

1. The Desire to Explore

This is one of my favorite examples of an infant's penchant for exploration. I was attending the Presbyterian baptism of a nine-month-old. Things started out well enough; the infant was nestled quietly in his dad's arms, but as the parents turned to face the pastor, the baby spied the handheld microphone. He quickly tried to wrest the mic out of the pastor's grip, flicking his tongue out at the ball of the microphone. The little guy seemed to think that the mic was some kind of ice cream cone, and he decided to test his hypothesis.

Thousands of experiments confirm that babies learn about their environment through a series of increasingly self-corrected ideas. They use fluid intelligence to extract information, then crystallize it into memory. Nobody teaches infants how to do this, yet they do it all over the world. They are scientists, and their laboratory is the whole world.

Exploratory behavior is a talent highly prized in the working world, too. What traits separate creative, visionary people who consistently conjure up financially successful ideas from less imaginative, managerial types who carry them out? Two business researchers explored that simple question and found that visionaries had in common five characteristics, which the researchers termed "Innovator's DNA." Here are the first three:

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- An unusual ability to associate. They could see connections not obvious to others.
- An annoying habit of constantly asking, "What if?" And, "Why not?" and, "How come you're doing it this way?"
- An unquenchable desire to tinker and experiment.

What is the biggest common denominator of these characteristics? A willingness to explore. The biggest enemy was the non-exploration-oriented system in which the innovators often found themselves.

Educators can encourage children's natural desire to explore — starting with understanding how inquisitiveness contributes to children's intellectual success.

2. Self-control

A healthy, well-adjusted preschooler sits down at a table in front of two marshmallows. It's not a kitchen table — it's Walter Mischel's Stanford lab during the late 1960s.

"You see these marshmallows?" Mischel says. "You can eat just one of them right now if you want, but if you wait, you can eat both. I have to go away for five minutes. If I return and you have not eaten anything, I will let you have both marshmallows. If you eat one while I'm gone, the bargain is off and you don't get the second one. Do we have a deal?"

The child nods. The researcher leaves.

What does the child do?

If the children are kindergartners, 72 percent cave in and gobble up the marshmallow. If they're in fourth grade, however, only 49 percent yield to the temptation. By sixth grade, the number is 38 percent, about half the rate of the preschoolers.

Welcome to the interesting world of impulse control. It is part of a suite of behaviors under the collective term "executive function." Executive function controls planning, foresight, problem solving, and goal setting. Mischel and his many colleagues discovered that a child's executive function is a critical component of intellectual prowess.

Why? Executive function relies on a child's ability to filter out distracting (in this case, tempting) thoughts, which is critical in environments that are oversaturated with sensory stimuli and myriad on-demand choices. That's our world, as you have undoubtedly noticed, and it will be our children's, too.

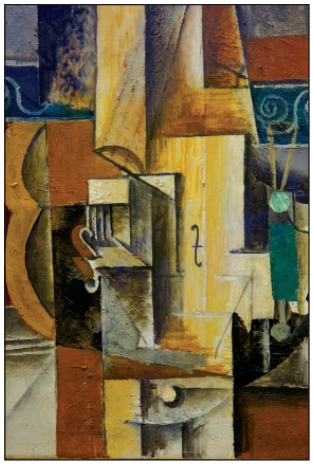
3. Creativity

My mother's favorite artist in the world was Rembrandt. She was much less enamored of 20th-century art. I remember her railing about Marcel Duchamp's *Fountain* — simply a urinal — being placed in the same artistic firmament as her beloved van Rijn. Toilets as art? And she hated it? For me as an 11-year-old boy, that was artistic Valhalla!

Mom set aside her own preferences and followed my curiosity. She brought home two pictures wrapped in brown paper and sat me down. "Imagine," she began, "that you tried to express in two dimensions all the information of a three-dimensional object. How would you do it?"

I stumbled around trying to find the right answer, but made no progress.

Mom interrupted. "Perhaps you would come up with something like this!" Mom revealed two prints of Picasso masterpieces: *Three Musicians* and *Violin and Guitar*. It was love at first cube. *Three Musicians* was a revelation to me, as was the creative mind that conceived it.



Pablo Picasso, *Guitar and Violin*, 1912

Why did I think that? How does anyone recognize creativity?

Pablo Picasso, *Three Musicians*, 1921

It is a tough question, saturated in cultural subjectivity and individual experience, as the differences between my mother and me showed.

Researchers do believe that creativity has a few core components, however. These include the ability to perceive new relationships between old things, to conjure up ideas or things that do not currently exist. Creativity also must evoke emotions, positive or negative, in someone else. Something — a product, a result — has to come of the process.

Can you predict creativity in kids? Psychologist Paul Torrance created a 90-minute exam called the Torrance Tests of Creative Thinking. Children might be presented with a picture of a stuffed rabbit, then told they have three minutes to improve upon the design to make it more fun to play with. They might be presented with a scribble, then told to make a narrative from it. Torrance then followed their lives into adulthood, assessing their creative output throughout: things like patents filed, books written, papers published, grants awarded, and businesses started.

As a research tool, the exam has been formally evaluated many times. Though the test is not without its critics, the most amazing finding remains how well a child's scores predict his or her future creative output. The test has been translated into 50 languages and taken by millions of people. It is the go-to standard for evaluating creativity in children.

4. Verbal Communication

The most memorable experience in my rookie year of parenting our younger son, Noah, was the moment he said his first multi-syllable word. At the time, he possessed a particular preoccupation with sea creatures, which I blame in equal parts on *Finding Nemo* and *National Geographic*. We put pictures of sea animals on the ceiling above his changing table, including a cartoon of a giant red Pacific octopus.

One morning I was busy changing his diaper, just before work. Noah suddenly stopped smiling and just stared straight at the ceiling as I cleaned him up.

Slowly, deliberately, he pointed his finger upward, turned his gaze from the ceiling, looked me straight in the eye, and said in a clear voice: "Oct-o-pus." Then he laughed out loud.

I almost had a heart attack. "Yes!" I cried, "OCTOPUS!"

He replied, "Octo, octo, octopus," laughing now. We both chanted it.

You can't argue with the fact that verbal skills are important in human intelligence. What happened in Noah's brain that made so many things come together at once on that changing table — or in any other child's brain as language dawns on her like a sunrise? We don't really know. Many theories abound about how we acquire language.

At birth, your baby can distinguish between the sounds of every language that has ever been invented. Professor Patricia Kuhl, co-director of the Institute for Learning and Brain Sciences at the University of Washington, discovered this phenomenon. But by their first birthday, Kuhl found, babies can no longer distinguish between the sounds of every language on the planet…. Unless they have been spoken to, in person, by someone who speaks another language.

Tucked into this data is a bombshell of an idea, one with empirical support across the developmental sciences. Human learning in its most native state is primarily a relational exercise. You can literally rewire a child's brain through exposure to relationships.

5. Interpreting Nonverbal Communication

Though speech is a uniquely human trait, it is nestled inside a vast world of communication behaviors, many of which are used by other animals, too. But we aren't always communicating the same thing, as legendary dog whisperer Cesar Millan points out. Millan is a world-champion dog handler. His secret is that he thinks like a dog, not like a person, when he's interacting with a dog.

Millan told *Men's Health*, "A lot of people who meet a new dog want to go over to him, touch him, and talk to him." But, Millan says, "in the language of dogs, this is very aggressive and confusing."

Instead, Millan says, when you meet a new dog, ignore the animal. Don't make eye contact. Let the dog come over and inspect you, sniff you. Once the dog gives you cues that he doesn't find you a threat, then you can talk, touch, or make eye contact. When dogs attack people, they may in some cases simply be acting upon an ancient behavioral reflex involving a reaction to, of all things, somebody's face.

Extracting social information by examining the face is a powerful slice of mammalian evolutionary history. But we humans use our faces, including eye-to-eye contact, for many reasons besides communicating threats.

We have the most sophisticated nonverbal message systems on the planet. From babies on up, we constantly communicate social information with our bodies in coordination with our smiles and frowns.

From exploration, self-control, and creativity to verbal and nonverbal ability, it is clear that the intelligence stew has many ingredients. Standard IQ tests are not capable of measuring most of these elements, even though they play a powerful role in the future success of children. However, our survival depends on the ingredients described in my mom's stew.