

The Chemistry of Culture

**HOW TRUST, EMPOWERMENT, AND COLLABORATION
DRIVE POSITIVE RELATIONSHIPS IN SCHOOLS**

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June 2018

I've spent most of the last 20 years helping schools to improve by implementing new ideas or programs. I've worked with or watched many schools go from struggling to successful. As an ICLE coach, I'm often asked about the secrets to success, or some version of "So, just how do you become a Model School?" Obviously, there are many answers. But here's the single most overlooked lesson I've learned: If your culture is broken, you'll be very hard pressed to fix or successfully implement anything else. Most often, an unhealthy culture is the single biggest barrier to school success.

I think most of us instinctively understand that a positive school and classroom culture is not just important, but essential. We know that relationships are the building blocks of culture. And when we talk about the importance of relationships, everyone nods their heads in agreement. But what do positive relationships look like within a school? And as a leader, how do you cultivate a culture and foster strong relationships? Why are some cultures so positive, and how do some become so bad—even toxic? What exactly is culture? And how can we know if it's getting better, or worse?

CAN CULTURE BE MEASURED?

Neuroscientists are learning that there is, in fact, a chemistry of culture—and it can be measured. As scientists extend their exploration of how the brain works, they are also learning that the brain's chemistry creates a chemical foundation for our most basic human behaviors, including forming relationships with others. Within any group, the accumulated human relationships, behaviors, and emotions that we call "culture" is actually a drug, or to be more precise, a cocktail of drugs that flows in and around the brain. This mysterious "chemistry of culture" not only governs, but is governed by, our relationships with others.

Most of us non-scientists instinctively understand that culture shapes our behavior, and our behavior shapes our culture—but how does that happen? It seems to be some form of an intricate dance. What are the steps? Can we learn them? The field of Cultural Neuroscience has grown in just the past few years. Until very recently, exactly how this brain chemistry works has largely remained a mystery. But with new brain imaging techniques and each new discovery, neuroscientists around the world are now able to carry out amazing research that is unlocking the previously hidden secrets about the inner workings of the human brain, how it drives and determines our behavior and relationships, and how it forms our culture.

Neuroscience is generally defined as a branch of science that deals with the anatomy, physiology, biochemistry, or molecular biology of nerves and nervous tissue, and particularly in relation to behavior and learning. Cultural Neuroscience was made possible by the rise of neuroimaging research techniques that allow us to see inside the brain as it is working, and previous work in the field of cultural psychology. Neuroscientists can now study how our brains work in different situations, and the relationships between culture, cognition, and brain function. To do that, neuroscientists trace the pathways within the brain and central nervous system, and try to understand the processes. They use that information to explain human behavior and relationships. The accumulated relationships within a group are defined as culture.

I'm not a scientist, but I find this subject fascinating as it deeply connects to our work with Model Schools across the country. From these Model Schools I have learned that there are the three essential elements required to build a positive culture: trust, empowerment, and collaboration. From my neuroscience research and my work with the nation's most rapidly improving schools, there are specific brain-based strategies you can use to increase all three. Let's connect the dots and explore the implications for creating culture in our classrooms and schools.

YOUR BRAIN ON TRUST

In 2001, neuroscientists Paul J. Zak and Steve Knack began to study the economic impact of trust in the business world. They asked two essential questions:

- 1. Why do two people trust each other?**
- 2. And when they do, exactly what happens inside the brain?**

They hypothesized that there must be some sort of signal in the human brain that tells us when we should trust someone.

They knew from previous research in rodents that a brain chemical called oxytocin signaled when it was safe to approach another animal. They decided to measure the brain activity of people while they worked, to see if it was also true in humans. They learned that when people interact positively with each other in a caring, empathetic, and ethical way, we also release oxytocin in our brains. Their studies eventually showed that the relationship between the amount of oxytocin produced and trustworthiness is so exact, it can actually be used to predict the level of trust in any relationship. Additional studies have since shown that people who were given synthetic oxytocin were twice as likely to trust strangers and increased their empathy.

We've all heard of the fight-or-flight response, but new brain research shows that there is an equally powerful brain response when we positively interact with others. fMRI experiments have demonstrated that certain, positive behaviors trigger the release of oxytocin in our brains, and that specific behaviors can literally "bathe our brains" in oxytocin. This flood of chemicals not only tells us when another person is safe and trustworthy, it increases our sense of well-being, and produces a significant reduction of brain activity in the areas associated with fear and stress.

Ultimately, Zak and Knack found that trust can significantly improve the confidence in and the success of business relationships. Their international [study](#) of 41 countries showed that trust was among the strongest predictors of business success.

FIRST IMPRESSIONS

You never get a second chance to make a first impression! Psychologist and Harvard Business School Professor Amy J.C. Cuddy has studied first impressions for more than 15 years. Dr. Cuddy has discovered several key characteristics that determine how we quickly “size up” another person. Her work demonstrates that it is our estimate of another person’s trustworthiness and warmth that have the greatest impact, and her work shows that trustworthiness is the single most important factor in how we ultimately judge and relate to others.

In “The Neuroscience of Savoring Positive Emotions,” Christopher Bergland reports that specific areas of the human brain are activated when experiencing positive emotions and/or receiving recognition. People with more sustained levels of activity in these areas have higher levels of oxytocin, report greater psychological well-being, and have lower levels of the stress hormone cortisol. The brain is complex and scientists are still learning about oxytocin’s interaction with other chemicals in the brain. Findings conclude that higher levels of estrogen can increase a person’s sensitivity to oxytocin while multiple studies confirm that women release more oxytocin than men. Additional studies show that, in general, women connect more easily with others. Women may have the upper hand when it comes to the chemistry of leadership.

YOUR BRAIN ON CULTURE

Beth Azar authored a fascinating [article](#) that digs even deeper into cultural differences and how our brains work. She explains that American and Chinese brains function differently when considering traits of themselves versus traits of others and that behavioral studies have found that people from collectivist cultures, such as China, think of themselves as deeply connected to other people in their lives. On the flip side, Americans adhere to a strong sense of individuality.

Additional neuroscience research has shown that the impact of culture is so profound, it even determines how our brains process information. A fascinating study by Yiyuan Tang of Dalian University of Technology in Dalian, China, found that Chinese and Americans actually do math differently. Chinese natives make use of different parts of the brain than Americans do when processing numbers.

Another [study](#) by Northwestern University psychologist Joan Chiao, revealed that Chinese collectivist culture may insulate against certain types of mental illness, and that people from East Asian cultures are far more likely than Americans to have a gene that buffers them from depression.

These scientists are confirming that what the brain finds rewarding is not only determined by the values of one’s culture, but also the underlying chemistry of how it happens. These discoveries also shed new light on how different people can see the same objects or circumstances, but have completely different neural responses. It seems that seeing is not just in the eye of the beholder, but the brain as well. Neuroscientists are confirming that the impact of culture on our brains is so strong that it can change the way we see the world.

Tufts University psychologist Nalini Ambady has found that even when people see the same image, their brains may respond and process it very differently. In a [study](#) published in *Neuroimage*, researchers used MRI to measure brain activity in American and Japanese subjects as they viewed silhouettes of bodies in postures considered “dominant” for example, standing tall, arms crossed, and “submissive” with head and arms hanging down.

The study was based on multiple studies showing that East Asian cultures value submissiveness, while Western cultures value dominance. They discovered that, not only was this true, but that they could actually see this cultural distinction in the way the subjects’ brains responded to visual input. When Americans viewed dominant silhouettes, but not submissive ones, the brain’s reward circuitry fired. But in the Japanese participants, the exact opposite was observed. Their brain’s reward circuitry fired only in response to submissive images.

Even more interesting, Ambady reported that the magnitude of the brain’s response to these images correlated directly with the extent to which the Japanese and American subjects reported how much they valued dominance and submissiveness. The more a subject valued dominance, or being in control, the stronger their brain’s reward circuitry fired when they viewed a dominant image. What this means is that what the brain finds rewarding reflects the values of its culture.

Studies like these—and there are many more—demonstrate that neuroscience can measure cultural differences and are changing the way scientists think about brain development. These scientists are learning exactly how the chemistry of the brain can be changed by our culture and environment.

THE CHEMISTRY OF CULTURE

I have been able to experience some of these cross-cultural differences firsthand. My ICLE coaching work has taken me to Asia and Hawaii for almost a decade. For four years now, I’ve had the honor to serve as a leadership coach at Farrington High School in Hawaii, which is a true success story of a system that has moved from struggling to successful. Farrington High School, in the Kalihi neighborhood of downtown Honolulu, is a two-time ICLE Model School because there is something special about the chemistry of the culture. It’s a culture built on a foundation of positive relationships, sharing a vision of rigorous and relevant learning for all.

Through this shared vision, school leaders, teachers, and students have created their own map for building a highly effective culture—a culture of learning, a culture of teaching, a culture of A’o. In the Hawaiian language there is only one word for both teaching and learning: A’o. In Hawaiian culture, teaching and learning are seen as one thing—different sides of the same coin, different sides of a circle. When one learns anything, they feel an obligation to pass it on. Farrington’s positive A’o culture is built on:

- **Trust**
- **Empowerment**
- **Collaboration**

I've taken tons of good-natured cracks from family, friends, and colleagues about having to "work" in Hawaii. And, yes, Hawaii truly is that tropical paradise many of us dream about. Turquoise seas, tradewinds, and green-cloaked mountains have made many a picture-postcard. But the geography is not what I fell in love with, nor is it what makes Hawaii unique. I fell for the culture!

The diversity of cultures in Hawaii is unlike anywhere else in America. The entire history of the state is wave after wave of new cultures arriving from around the globe. These volcanic rocks in the middle of the Pacific produced no native culture. Everyone, and every culture, came as a wave, arriving from some other shore. Even the first ancient Polynesian voyagers sailed more than 5,000 miles across the open South Pacific. The amazing cultural diversity of Hawaii must be experienced to be understood, and that takes time. But I find observing the cultural differences on display there to be incredibly fascinating. And it is Hawaii that makes the neuroscience and the chemistry of culture come alive for me. Hawaii has managed to turn its greatest challenge, managing cultural diversity, into its greatest strength. This strength is so strong, and so important. I believe all of America can learn something from the Hawaiian way.

That belief is now supported by the growing body of neuroscientific research that clearly demonstrates the impact of culture on our brains, and the cultural differences that brain chemicals can produce. Science helps us to understand how much the brain can be changed by our environment. The exciting part is that multiple studies now locate the exact areas and pathways of the brain involved in creating and sustaining positive emotions. These studies are showing exactly how the brain chemicals like oxytocin help humans build trust, form friendships, and work well together on a team.

There really is no longer any doubt that neuroscientists are confirming the underlying "Chemistry of Culture" at work in our brains. What can we learn from them? We can learn that culture does not happen by chance, that a positive school culture can be intentionally built. Neuroscience has shown that there are specific leadership strategies we can use to flood our brains—and the brains of our colleagues—with the perfect blend of chemicals, and that by using these strategies, we can build better relationships and greater trust within any school. Conversely, in a toxic culture, we can often find management strategies that trigger the release of the wrong chemicals that have the exact opposite effect! What type of culture do you want to cultivate in your school?

Stay tuned for Paper Two in this series where I will share data on the growth of Farrington High School, and the steps they took to create a positive culture of innovation.



The Farrington team at the 25th Model Schools Conference in Nashville, TN.