

# The Neuroscience of Trust

By Paul J. Zak

## Leadership and Neuroscience: Managing the Brain and Human Behavior

By Brad Winn

*We may just be entering a new era of enlightenment as an explosion of neuroscience research from around the world begins to piece together the connections between the brain and behavior. As brain researchers attempt to tie together the neurological and social sciences, I can't help but wonder what implications their findings will have for the future of HR—a profession that rightly prides itself in understanding what makes humans tick at work.*

*So it was with a good deal of curiosity that I interviewed Dr. Paul Zak, director of the Center for Neuroeconomic Studies at Claremont Graduate University, and read his article submitted to People & Strategy. What I learned was the way our brain functions and the chemicals it releases may have as much to do with how employees feel and act at work as do our strategies for organizing and managing. But I also learned that the way we organize and manage human beings can affect the functioning and chemical releases of the brain. So in a recursive manner, neuroscience is uncovering both the power of the brain on human behavior and the power of organizational environments on the brain.*

*At the heart of the issue lie these questions: What would corporate leaders do differently if they were more keenly aware*

*of the new findings in brain research? What can we learn from neuroscience that will help both leaders and individuals work more effectively together within organizations?*

*What started Zak down this research path was his laboratory discovery that certain chemicals released in the brains of animals increase their ability to affiliate more deeply and more effectively. When he replicated this experiment on humans, he found that oxytocin and other chemicals are highly correlated with how well people work together in relationships of trust. He further found that levels of stress at work and other organizational factors affect how the brain releases these chemicals and the resulting levels of trust and empathy.*

*Trust and other social factors are sometimes thought to be too “squishy” or “soft” for leaders to get their arms around and manage. This article gives us a glimpse into how neuroscientists think about management issues and offers eight factors for building high-trust organizations based on brain science. Time will tell if this new era of research on the brain and behavior will impact HR practice and how we manage people and strategy in the future.*

Numerous management books and articles have extolled the virtues of trust. Trust is declared to be some near-magical economic elixir, facilitating productivity, creativity, and humanity at work. Many HR professionals struggle to build trust throughout an organization because they find that trust is squishy, subjective, and probably impossible to measure. If we could solve these issues, many managers tell me their organizations would jump on the trust train.

Fortunately, discoveries in neuroscience—many from my laboratory—have provided new, rigorous, and actionable insights into what trust is, how it can be measured, and most importantly, how organizations can raise trust and reap its rewards.

### What Is Trust?

The first comprehensive mathematical derivation of trust came from a 2001 biologically-based general equilibrium model by Steve Knack and me.<sup>1</sup> It showed that trust reduces the transactions costs associated with investment decisions by increasing confidence in what the other party would do. This model predicted that by lowering (implicit) costs, investment would increase. We tested the model in a sample of 41 countries and found that trust was among the strongest predictors economists had ever found for investment and per capita income growth. The model showed, and the empirics confirmed, that trust would increase with the level of income, with “similarity” (in income, ethnicity, language, and genes), with fairness, and with the strength of formal and informal contract enforcement. Trust is an economic lubricant, reducing the frictions that often occur during economic activity.

## Trust Is Chemical

The next step I took was to test why in a given environment one would tangibly and intentionally trust a stranger. I wanted to know whether there was a “switch” in the brain that could be engaged to “turn on” trust. Based on studies of social rodents, I hypothesized that the neurochemical oxytocin (OT) might be such a switch. My team ran a series of experiments where an individual could invest earned money with a stranger to obtain a return. But this required that the individual trust the investment agent to return the investment and not keep some or all of the money. The standard view in economics was that money is always valued and thus anyone who controlled money would keep it. But,

when given a chance to return some of the largess they controlled, those who were trusted nearly always readily returned money.

This approach allowed us to quantify trust and trustworthiness. We also obtained blood samples before and after decisions to assess changes in OT. We found that the receipt of money (denoting trust) caused the brain to synthesize OT. Further, and importantly, the amount of OT produced predicted trustworthiness—the return of money to the investor. We ruled out other neurochemicals that could cause this effect, and in a control task randomly sent people money and showed this did not cause a spike in OT.<sup>2</sup> We then demonstrated the causal effect of OT on trust by safely infusing synthetic OT into people’s

brains (through their noses), showing that, compared to placebo, OT administration substantially increased trust.<sup>3</sup>

## The Trust Balancing Act

We are constantly seeking the right balance between being wary of strangers and interacting with them. Cooperating with others puts us at risk of exploitation, but such interactions also allow us to derive value. This value could be friendships, romantic partnerships, or agreeing to work together on a project. OT signals that a person is safe to be around by reducing our natural vigilance when we are around others. OT evolved in mammals to facilitate live birth and care for offspring.



# Research Corner

When our brains synthesize OT while interacting with others, we are motivated to treat them like family. Functional magnetic resonance imaging experiments have shown that infusing people with OT results in a marked reduction in fear-associated brain activity.<sup>4</sup>

## Feeling Trust

We were curious to know if there is a change in how people felt when their brains produced OT. In a series of experiments, we showed that OT makes us feel empathy for others. The more OT the brain made, the more people reported feeling empathy towards individuals. OT appears to be the biological substrate of empathy—it connects us emotionally to others, even complete strangers, and nudges us to invest in helping them. For instance, in experiments using public service ads, OT predicted donations to featured charities. This care-for-others effect of OT even occurs at a distance, for example, through movies and social media.<sup>5</sup> We are a connecting species, and nearly any positive interaction we have studied in lab and field experiments induces the brain to make OT. OT acts as the chemical basis for the Golden Rule: If you treat me nice, my brain will make OT and I'll be motivated to treat you nice. Except sometimes I won't.

## Enhancing and Inhibiting OT

My lab has shown that several other neurochemicals promote or inhibit OT release. This means that not every positive social encounter will be reciprocated as such. A primary inhibitor is a stress hormone called epinephrine.

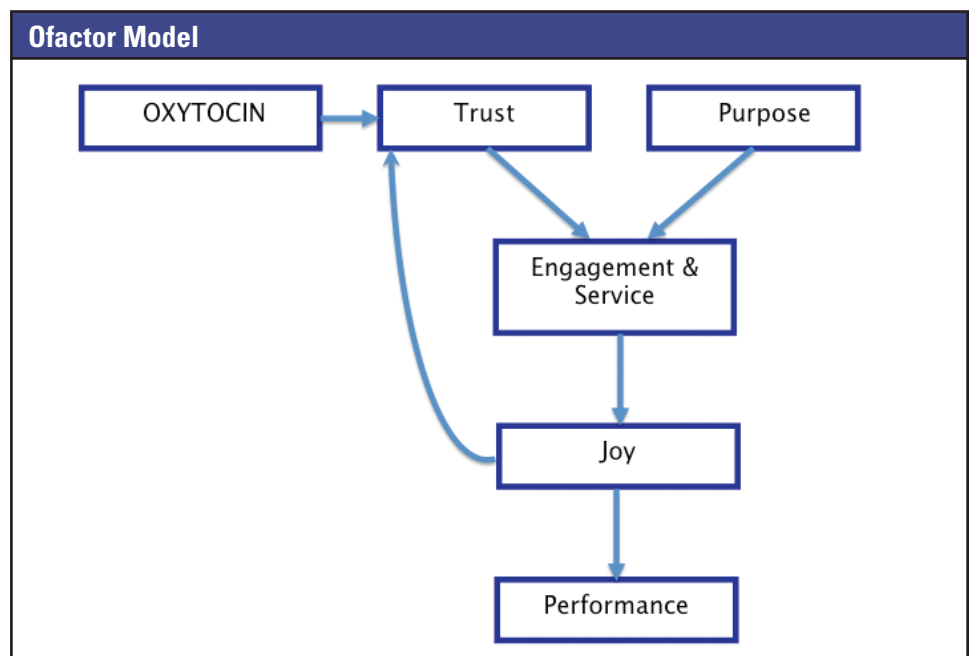
When we are highly stressed, we move into survival mode and focus only on ourselves. When you're in this mode, you tend to grump at people. Usually, those around you understand that you're having a bad day. Interestingly, though, it turns out that moderate stress increases OT release. When we're facing a challenge, we often turn to others to help us surmount it. Think of how giddy you feel riding a roller coaster, and how much you chat with the person next to you.

The primary female hormone estrogen increases one's sensitivity to OT. Indeed, in every study of OT my lab has done over the last 12 years, on average, women release more OT than men. This helps explain why women tend to connect more easily with others than do men. Nature has played a further trick on the sexes when it comes to OT. A potent OT inhibitor is testosterone, a substance that is five to 10 times higher in men than in women. In experiments in which we administered synthetic testosterone to men, we found that compared to men on placebo, the alpha males we created were more selfish and more entitled. That is, they were less generous and demanded more from others. It is as if testosterone is whispering in one's brain, "You have the best genes on the planet; all should bow down before you." Testosterone levels decrease as men age, when they are in committed relationships, and when they have children—but they rise with social status. If a man or

woman wins a chess match, his or her testosterone goes up. Now consider what happens when one gets a promotion at work. Being conscious of the chemical soup our brains swim in allows us to control (to a degree) the behaviors encouraged by changes in neurochemicals.<sup>6</sup>

## Sports Teams as Models of Business

Before I began applying this knowledge to study trust in organizations, I ran experiments on groups in competition. I measured OT and associated neurochemicals in soldiers, dancers, and sports teams. One of the first experiments I did was for BBC television with a rugby team.<sup>7</sup> Rugby reflects the hard knocks of business life many of us live. It requires in-group cooperation and out-group aggression. How the brain balances these demands is fascinating. We found, by taking blood before and after the warm-up to a match, that ruggers' OT increased, but so did their testosterone and stress hormones. These guys were hitting all the buttons in the brain, and the brain modulated these factors in a give-and-take fashion, a bit more cooperation here and a dollop of aggression there. The same can occur in highly focused and competitive businesses.





## How to Build a High Trust Organization

I spend much of my life in vampire mode, taking blood from volunteers in experiments. While I have taken blood from employees to confirm that our findings apply to businesses, most companies (and their employees) prefer to avoid needles. As a result, I developed and patented a survey tool that assesses OT release among employees in organizations in order to quantify how corporate cultures affect interpersonal trust and the factors that produce trust. This tool, called Ofactor (see graph, “Ofactor Model,” page 14), measures eight classes of management policies that can be used to raise trust. Conveniently, these eight factors have an easy to remember acronym, OXYTOCIN:

Ovation (praise publicly and unexpectedly)

eXpectation (induce challenge stress)

Yield (learning through mistakes)

Transfer (management by absence)

Openness (crowd-source information)

Caring (build relationships)

Invest (whole person growth)

Natural (be vulnerable)

Neuroscience research offers specific ways that each of the OXYTOCIN factors can be used for maximal effect. Take Ovation as an example. Ovation will have the largest impact on brain and behavior when it is: public, unexpected, tangible, personal, comes from peers, and is close in time to the goal that was met or exceeded. The other factors have similar concrete ways they can be used for maximal effect.

## Joy and Purpose

An implication that follows from the neuroscience of trust is that employees will experience OT release when they understand how their work improves the lives of others. I call this an organization’s “transcendent purpose” to differentiate it from the typical transactional purpose of selling goods or services efficiently. Employees who embody transcendent purpose are highly motivated by the social nature of their work. My research shows that purpose

and trust together create joy. This can be stated mathematically as  $Joy = Trust \times Purpose$ .

## Performance

Comparing those in the highest quartile of organizational trust from 5,000 employees across various industries who have taken the Ofactor survey to those in the lowest quartile, we find that employees at a high-trust organization report that while at work they have: 70 percent less stress, 28 percent more energy, 26 percent more joy, 69 percent higher job retention, and 70 percent greater job satisfaction. The neuroscience experiments we have run on employees show that those in the top quartile of trust are 19 percent more productive, 22 percent more innovative when solving problems, and took 33 percent fewer sick days. Working in a high-trust organization also carries over outside of work. Employees reporting high trust are 17 percent more satisfied with their lives.

## What You Can Do Now

- View employees as volunteers. Volunteers need to be engaged by the organization’s mission or they will move on.
- Measure joy at work as a snapshot of your culture. Which division or location is most joyful? Which is the least? Copy the former and investigate the reasons for the latter.
- Run an experiment by changing one of the OXYTOCIN factors and measuring the effect on joy and productivity. Repeat with another factor.
- Orchestrate Ovation at least weekly. Try this at your all-hands meeting by inviting peers to tangibly recognize each other. A gift card from a local coffee shop is an easy way to provide recognition.
- Communicate your organization’s transcendent purpose both internally and externally. Increase its impact by communicating, for example, the story about the passion of the organization’s founder(s).

Building a high-trust organization allows you to improve the human triple bottom

line: good for the employee, good for the organization, and good for the community. All it takes is enough trust.

## Endnotes

- <sup>1</sup> Zak, P. J. & Knack, S. (2001). Trust and growth. *The Economic Journal*, 111: 295-321.
- <sup>2</sup> Zak, P. J., Kurzban, R. & Matzner, W. T. (2004). The neurobiology of trust. *Annals of the New York Academy of Sciences*, 1032: 224-227. Zak, P. J., Kurzban, R. & Matzner, W. T. (2005). Oxytocin is associated with human trustworthiness. *Hormones and Behavior*, (48): 522-527.
- <sup>3</sup> Kosfeld, M., Heinrichs, M., Zak, P. J. Fischbacher, U. & Fehr, E. (2005). Oxytocin increases trust in humans. *Nature*, 435(2): 673-676.
- <sup>4</sup> Kirsch, P., Esslinger, C., Chen, Q., Mier, D., Lis, S., Siddhanti, S., et al. (2005). Oxytocin modulates neural circuitry for social cognition and fear in humans. *Journal of Neuroscience*, 25, 11489-11493.
- <sup>5</sup> Zak, P. J. (2012). *The moral molecule: The source of love and prosperity*. New York: Dutton.
- <sup>6</sup> Zak, P. J. (2011). The physiology of moral sentiments. *Journal of Economic Behavior & Organization*, 77: 53-65.
- <sup>7</sup> <http://www.pauljzak.com/pressroom/tv/video/bbc-horizon-what-makes-us-good-or-evil>

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