

The Neuroscience of Leadership: Practical Applications



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Introduction

Management practices such as the open-book management approach (see [*Embracing Open-Book Management to Fuel Employee Engagement and Corporate Sustainability*](#)) encourage employers to practice open communication and transparency with employees to improve trust, teamwork, employee motivation, and performance. Studies evaluating the effectiveness of these methods show that they can also improve a company's bottom line. Until recently, though, we did not understand the core science behind these practices. Thanks to the emerging field of neuroscience, technological advances in functional magnetic imaging (fMRI), and a 2013 commitment by President Obama to support a brain-mapping initiative to help us understand the workings of the brain, we are beginning to see the physical link these and other management practices have to the brain (Waytz and Mason, 2013).

This white paper:

- Provides an overview about the emerging field of neuroscience;
- Introduces neuroleadership, a term coined by David Rock in 2006;
- Explores how to apply neuroscience findings to the workplace;
- Provides examples of how applying neuroleadership can improve leadership practices, change management, innovation and creativity, and employee engagement, and:
- Presents David Rock's SCARF model that summarizes the top five social rewards and threats important to the brain and discusses how HR and talent management professionals can use this model to improve employee and organizational performance.

Neuroscience is the study of how the nervous system develops, its structure, and what it does. The field's focus is on the workings of the brain, and although it was originally classified as a sub-discipline of biology, it has become a more interdisciplinary science that works closely with other fields such as mathematics, linguistics, engineering, computer science, chemistry, philosophy, and medicine.

The Emerging Field of Neuroscience and Neuroleadership

Leaders and HR professionals are continuously searching for better ways to engage, connect, and lead others. New advances in the field of neuroscience may help us unravel the physiology of leadership effectiveness. Neuroscience is the study of how the nervous system develops, its structure, and what it does. The field's focus is on the workings of the brain, and although it was originally classified as a sub-discipline of biology, it has become a more interdisciplinary science that works closely with other fields such as mathematics, linguistics, engineering, computer science, chemistry, philosophy, and medicine (Nordqvist, 2012). This emerging field is still in its infancy, and neuroscientists acknowledge that there is much more that they don't know about the brain at this time than they do know. Technologies like fMRI and position emission tomography (PET), however, have shown definite neural connections in the brain that have allowed scientists to develop a deeper understanding of the interconnectedness of the brain and behavior.

As professors Adam Waytz and Malia Mason wrote in a 2013 article for *Harvard Business Review*, neuroscience has already revealed insights that are applicable to the workplace, including:

- How to promote creative thinking;
- How to structure rewards;
- The role of emotions in decision making, and;
- The opportunities and (mostly) pitfalls of multi-tasking.

Insights from the field of neuroscience led David Rock, founder and CEO of the NeuroLeadership Group and author of *Your Brain at Work* (HarperBusiness, 2009), to coin the term **neuroleadership**. Neuroleadership focuses on applying neuroscience to leadership development, management training, change management education and consulting, and coaching (VanDerWalt, n.d.). A building body of applicable neuroscience research includes that when managers offer feedback to subordinates (whether it is positive or negative), an emotional reaction is triggered in the subordinate's brain that controls survival. Researchers Van Hecke, Callahan, Kolar, and Paller found that social pain—such as being ignored, ostracized, or humiliated—

triggers the same area of the brain as physical pain (VanDerWalt, n.d.). Other neuroscience research studies suggest that positive relationships between managers and employees trigger an area in the brain that activates openness to new ideas and a more social orientation to others (Boyatzis, 2011). By connecting hard science to leadership, these findings may help us understand why some employment and leadership practices are more effective than others.

Neuroscience and Leadership

In the not so distant past, the conventional definition of an effective leader was one who got results, boosted the bottom line, and generally forced productivity out of his or her employees. As HR and talent management professionals know all too well, some of the management practices used to get these results were at the cost of employee motivation, retention, trust, and ultimately the bottom line. With a window into neuroscience, today we have more insight into how to improve leadership behaviors.

Neuroleadership focuses on applying neuroscience to leadership development, management training, change management education and consulting, and coaching.

For example, a study (cited in Boyatzis, n.d.) found a link between effective leaders and resonant relationships with others. The study, using fMRI technology, found that when middle managers were asked to recall specific experiences with “resonant” leaders, 14 regions of the brain were activated. When asked to recall specific experiences with “dissonant” leaders, only six regions of the brain were activated and 11 regions were deactivated. The regions of the brain activated for resonant leaders were associated with exciting attention, activating the social system, and other regions associated with “approach” relationships. Dissonant leaders deactivated the social system and activated regions of the brain associated with narrowing attention, lowering compassion, and triggering negative emotions (Boyatzis, n.d.).

There is also a physical connection in the brain associated with trust, an emotion that is increasingly cited as a critical leadership trait to exhibit. A 2008 study identified a chemical in the brain called oxytocin that when released, makes a person more receptive to feel trust toward a stranger (Meacham, 2013). The brain actually determines trustworthiness within milliseconds of meeting a person. That initial determination is continually updated when more information is received or processed, as the brain takes in a person’s appearance, gestures, voice tone, and the content of

what is said. What this means for leaders is that it is possible to build trust among employees even if it has been lacking in the past.

Margie Meacham, an adult learning expert, offers the following steps leaders can take to build trust in an organization:

1. **Make people feel safe.** The brain categorizes survival as its top priority, so leaders who can show they are not a threat will be seen as trustworthy.
2. **Demonstrate fairness.** The brain seeks fairness and will react to perceived injustice with anger and frustration.
3. **Be genuine and be sure to show trust in others.** Meacham writes that “when we watch someone else, our brains are activated in the same way that the brain of the person we are observing is activated—through the function of special ‘mirror neurons.’” In other words, if a leader distrusts the person with whom they are speaking, the other person will pick up on it and mirror that distrust back (Meacham, 2013).

Neuroscience has also confirmed that gut feelings are real, and this can be helpful in leadership development. A gut feeling—that feeling that occurs without conscious thought—has a real neurological basis that results in physical changes to the body like increased heart rate, sweating, blushing, and goose bumps. Leaders have been taught to suppress gut feelings and to rely on making decisions based on logic and facts, but, as Waytz and Mason note, there is a mounting body of neurological evidence that emotional reactions like those should not be ignored. Gut feelings or hunches, they note, can certainly be fallible, but can be used to help bypass complex and time-consuming analysis. In situations that involve risk, negative gut feelings can be used to stop leaders from overly optimistic decisions (Waytz and Mason, 2013).

The HR Application of the Neuroscience of Leadership

HR and talent management professionals can readily apply these neuroscience findings to their leadership development activities. Some examples may include:

- Educating leaders about the link between the brain and the importance of building positive relationships with employees. Neuroscience shows us that resonant leaders open pathways in their employees’ brains that encourage engagement and positive working relationships. Good leaders pay attention to relationship building.

- Paying attention to trust levels in the organization and among managers and employees in particular. HR and talent managers can emphasize trust development in leadership development activities, and highlight the neuroscience behind why trust is so important. Trust can be fostered through open communication, clearly communicated goals, and transparency (Broughton and Thomas, 2012).
- Encouraging leaders to not dismiss their gut feelings. HR and talent management can share the science behind gut feelings and emphasize that while they are certainly not foolproof, they are worth paying attention to. Leaders can be taught to recognize them and considering them in decision making.

These neuroscience findings are helping to connect the dots between human interaction and effective leadership practices. As the mapping of the human brain continues, we can expect to learn more about how the brain functions and how leaders can use this knowledge to best lead people and organizations.

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Neuroscience and Change Management

HR and talent management professionals have long known that no one likes change. In fact, helping top management lead change has become a core HR competency. Change is feared because the brain, which is hard wired to survive, perceives it as a threat. This, in turn, causes an explosion of negative emotions that causes the brain and body to go into a threat response mode. Anxiety shoots through the roof, thinking becomes muddled, and the brain and body instinctively resist the perceived threat. These responses are so instantaneous that they may not even be recognized at first by the person experiencing the response.

The HR Application of the Neuroscience of Change Management

This deeper understanding of the fear of change—that the human brain will resist change that is perceived as a threat—has widespread implications for how HR and talent management professionals approach change management. If change is presented as a crisis (“If we don’t change immediately, we’ll all be out of a job”) or if a “just do it and don’t ask questions” approach is taken, the change effort will likely fail.

For change management to work, a more thoughtful approach may be needed. HR professionals and leaders should try to reduce stress and anxiety by focusing on the positive aspects of the proposed change, asking questions, and listening actively to employees' concerns. This process enhances the brain's ability to adjust its response to the change and perceive it as non-threatening (Turturici, n.d.).

Neuroscience and Creative Thinking and Innovation

There is a part of the brain that Waytz and Mason call the "default network" that neuroscientists have found is tied to innovation. The brain is never at rest. Even when it is not focused on a particular thought, areas in the brain remain active. This is the default network that hosts the one thing that makes us different than other species; the ability to transcend, to envision what it may be like to be in a different place or time. This network is unique to humans and is most effective when it is highly engaged. When people "transcend" (or imagine), the brain detaches itself from the external environment and focuses inward. It is during this time that creativity is at its peak and those "eureka" moments are most likely to occur (the experience of finding the solution to a problem when not actively focusing on it). The human brain needs unfocused time to spur creativity and innovation (Waytz and Mason, 2013).

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Another way to improve creativity and innovation is to appeal to another area of the brain that Waytz and Mason call the "control network." This network is the opposite of the default network. The control network suppresses the default network to allow the brain to focus on the present moment so it won't wander all the time. It keeps us on task.

Scientists have also discovered that this network works best when it is faced with limited distractors such as email, phone calls, the Internet, and all the other daily factors that draw us away from task and increase anxiety. This network, whose reason for being is to maintain focus, also prevents us from being effective multi-taskers. It is literally not something human beings can do. Studies show that people who try to multi-task are unable to allocate brain resources in a way that matches their priorities.

The result of multi-tasking is one or more jobs done poorly, mental fatigue, shallow thinking, and impaired self-regulation (Waytz and Mason, 2013).

The HR Application of Neuroscience and Innovation and Creativity

HR and talent management professionals can apply the knowledge gained through neuroscience to improve innovation and creativity. Examples may include:

- Engaging the default network to encourage innovation. Establish programs similar to those at Google and Maddock Douglas that allow employees protected time to work on an inspired project of their choice that advances the organization in some way.
- Engaging the control network to encourage focus. Establish and support “technology free” blocks of time when phones and email are turned off.

HR and talent management professionals can encourage creativity and innovation by supporting unstructured free time, minimizing daily distractors, limiting employee goals to improve focus, and “banning” multi-tasking. In addition to establishing blocks of “technology free” time, some experts encourage reducing the number of meetings to only those that are absolutely necessary. These actions promote focus, reduce anxiety and ultimately, improve creativity and innovation.

Unfocused Time in Action

Some organizations have realized the brain’s need for unfocused time and have taken steps to give employees that time. Google has a “20 percent time” program where company engineers get a day each week to work on whatever they want. Marketing firm Maddock Douglas gives employees 100 to 200 hours each year to work on anything that interests them. Consulting firm BrightHouse gives employees five “Your Days” a year to reflect and free associate. Intuit, Twitter, and the software firm Atlassian have similar programs (Waytz and Mason, 2013). Waytz and Mason applaud these efforts, but also urge employers to provide employees with even more time to engage the default network with the goal to improve creativity.

Neuroscience and Employee Engagement

Much of the same neuroscience findings that can be applied to improve leadership skills, reduce anxiety during times of change, and improve creativity and innovation can be applied to employee engagement. In a recent article for simply-communicate.com, Hilary Scarlett, a change and employee communication specialist, offers 10 reasons why the application of neuroscience findings can help improve employee engagement. This list encapsulates much of the neuroscience findings discussed in this paper and applies them to employee engagement.

Neuroscience:

1. Shows the link between communication and employee engagement, proving that employee engagement is not “soft.”
2. Supports what good communicators and leaders have espoused for years—that people work better together when they have good relationships with their bosses and peers.
3. Enlightens leaders about how the brain works best and can alter a leader’s approach to how to meet goals, and improve innovation and collaboration in an organization.
4. Identifies what motivates the brain to perform at its best. Leaders can use that information to substantially impact engagement. Conversely, neuroscience has confirmed what practices produce fear and reduce employee performance and engagement.
5. Confirms that business leaders have vastly underestimated the human need for social connection in the workplace.
6. Raises questions about how we currently work. Open plan offices, a constant influx of emails, and multiple mobile devices that are always on impede creativity and innovation and decrease employee engagement.
7. Allows leaders to better understand how the brain works, helping them to work with the physiology, not against it.

8. Has macro and micro applications that can help change an organization at the macro level and help employees better organize their days to help their brains work at their best at the micro level.
9. Has offered scientific proof that multi-tasking is impossible for the brain. Leaders who expect their employees to multi-task are doing a disservice to their organizations and are harming their employees' well-being.
10. Is proving to be quite persuasive to even the most skeptical of leaders (Scarlett, 2014).

The HR Application of Neuroscience and Employee Engagement

HR and talent management professionals can use neuroscience to help improve employee engagement. Examples may include:

- Using the studies discussed in this paper, explain how neuroscience links the brain with employee engagement.
- Fostering a top-down approach to employee engagement. HR and talent management professionals should encourage and educate leaders on how to develop positive working relationships with their peers and employees to increase employee engagement.
- Making innovation and creativity a top organizational priority to improve employee engagement. HR and talent management professionals may want to re-evaluate open plan offices, the constant barrage of emails, 24/7 access to technology, and other practices that neuroscience has found to reduce innovation, creativity, and focus.
- Making multi-tasking a thing of the past. Neuroscience proves that it cannot be done.

David Rock's SCARF Model

Neuroscience and the mapping of the brain is producing a gamut of new information for scientists to immerse in. The amount of information gleaned alone so far that can be applied to the workplace is colossal. To help leaders, HR

professionals, and talent managers sift through this information and readily apply it, David Rock developed the SCARF Model. The SCARF model targets the top five social rewards and threats identified so far that are deeply important to the brain:

- **Status**
- **Certainty**
- **Autonomy**
- **Relatedness**
- **Fairness**

Status relates to a person's relative importance to others. Certainty is about being able to predict the future. Autonomy provides a sense of control over events. Relatedness is the sense of connection and safety with others (the brain perceives a friend versus a foe). Fairness is the perception of being treated justly.

These domains in the brain activate either a "primary reward" or "primary threat" response in the brain. For example, a perceived threat to one's status will trigger a primary threat response in the brain because, as discussed earlier, the brain's primary goal is survival. A perceived increase in fairness (an open discussion of a company's compensation practices to assure all employees perceive that their compensation is fair and equitable, for example) will activate the same "primary reward" response as when receiving a monetary reward.

Fairness is core not only to humans but hard wired in primates as well. Primatologist Frans de Waal found that capuchin monkeys can discern unfairness, particularly when it comes to pay inequity. As he explains in a [YouTube clip](#), when one capuchin monkey is rewarded with a cucumber for a completed task, she accepts it willingly—the first time. When she sees another capuchin monkey rewarded with a more desired grape for the same completed task and she is rewarded again with the less-desired cucumber, she throws the cucumber at the researcher. Primates like humans have a highly honed sense of fairness.

Rock identifies status as one of the most significant drivers in the brain. A person will avoid a decrease in status in much the same way he or she would avoid pain, because the perceived threat of diminished status triggers the same area in the brain as pain.

This is an important consideration, as previously discussed, when presenting change because change to the brain means a threat to social status.

The brain also craves certainty and predictability. When presented with any change, the brain will activate the limbic system and put it on alert, putting the recipient of the potential change into the “fight or flight” mode to survive. The brain also prefers autonomy, the ability to predict and have input into the future, so when presenting issues that may trigger uncertainty, HR and talent managers should consider how to calm those triggers by allowing employee discussion and participation into resolving the issues.

The brain also seeks connection with others—this is relatedness. As discussed earlier, employees will respond better to bosses and peers whom they find to be “resonant.” Dissonant managers trigger a negative response in the brain, which then categorizes them as a foe, leading to distrust and disconnection. As mentioned, the brain is also a big proponent of fairness. A study conducted by Jamil Zaki of Stanford University and Jason Mitchell of Harvard University found that when people were allowed to divide up small amounts of money among themselves, the brain’s reward network responded much more when the participants made generous, equitable choices (Waytz and Mason, 2013).

This model can be used as a guide to assess existing and proposed management practices and whether they trigger a “primary reward” or “primary threat” response in the brain.

Conclusion

Neuroscience—the study of the nervous system—has widespread application possibilities, from understanding the genesis and possible cures to such disorders as schizophrenia, autism, and Alzheimer’s disease to better understanding the science behind our interactions with each other. By leveraging neuroscience and increasing our understanding of the brain, we can enhance overall interaction effectiveness. Although there is far more to discover, what has been learned so far and framed into the SCARF model can help make positive organizational improvements including more effective leadership skills, successful change management initiatives, better creativity and improved innovation, and a more engaged workforce. If we can better understand how the brain functions, as HR influencers, we can transform how leaders think, develop, and perform.

About UNC Executive Development

Our approach to program design and delivery draws upon the power of real-world, applicable experiences from our faculty and staff, integrated with the knowledge our client partners share about the challenges they face.

We call this approach [The Power of Experience](#). We combine traditional with experiential and unique learning to ensure that all individuals gain relevant new skills that they can easily implement within their own organizations. Through action learning and business simulation activities, we challenge participants to think, reflect and make decisions differently.

Our Approach: The Partnership

Our team customizes each leadership program through a highly collaborative process that involves our clients, program directors, faculty and program managers. We are dedicated to following-up with our clients and individual participants to ensure that their learning experiences have been meaningful and impactful. This integrated approach consistently drives strong outcomes.

Our Approach: The Results

Our executive education programs are designed with results in mind, and we are focused on successfully meeting our clients' business and academic expectations. Below are a few examples of the results our client partners have achieved:

- Leadership refocused with new strategy and cohesive vision
- Strategic plans created for the global marketplace
- Supply chains streamlined
- Products redefined
- New markets targeted
- Cost-saving measures developed
- Silos leveled
- Teams aligned

Participants leave empowered to bring in new ideas, present different ways to grow business and tackle challenges. The result is stronger individuals leading stronger teams and organizations.

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Sources

Berkman, E. and Rock, D. (10 October 2012). To achieve your goals, learn how to hack your brain. *Fast Company*. Retrieved from <http://www.fastcompany.com/3002031/achieve-your-goals-learn-how-hack-your-brain>.

Boyatzis, R. (January/February 2011). Neuroscience and Leadership: The promise of insights. *Ivey Business Journal*. Retrieved from <http://iveybusinessjournal.com/topics/leadership/neuroscience-and-leadership-the-promise-of-insights#.UwZW7fldVSB>.

Broughton, A.C. and Thomas, J. (2012). Embracing Open-Book Management to Fuel Employee Engagement and Corporate Sustainability. Chapel Hill, NC: *UNC Kenan Flagler Business School*.

CCL staff (2011-2012). Big idea #1: Get your brain in the game. In *Center for Creative Leadership 2011-2012 Annual Report*. Greensboro, NC: Center for Creative Leadership.

Hwang, V. (28 March 2013). Can neuroscience explain innovation? *Forbes*. Retrieved from <http://www.forbes.com/sites/victorhwang/2013/03/28/can-neuroscience-explain-innovation/>.

Meacham, M. (02 July 2013). The neuroscience of leadership and trust. *ASTD*. Retrieved from <http://www.astd.org/Publications/Blogs/Human-Capital-Blog/2013/07/The-Neuroscience-of-Leadership-and-Trust>.

Nordqvist, C. (27 November 2012). What is neuroscience? *Medical News Today*. Retrieved from <http://www.medicalnewstoday.com/articles/248680.php>.

Pillay, S. (21 February 2011). Relevance of neuroscience to the business environment. *FT Press*. Retrieved from <http://www.ftpress.com/articles/article.aspx?p=1645876>.

Rock, D. (2009). *Your Brain at Work*. New York: HarperCollins.

Rock, D. (10 March 2011). The neuroscience of leadership. *Psychology Today*. Retrieved from <http://www.psychologytoday.com/blog/your-brain-work/201103/the-neuroscience-leadership>.

Rock, D. (28 September 2012). Three ways to think deeply at work. *HBR Blog Network*. Retrieved from <http://blogs.hbr.org/2012/09/three-ways-to-think-deeply-at-work/>.

Rock, D. (20 February 2013). How to heal our smartphone-addled, overworked brains. *CNN Money*. Retrieved from <http://management.fortune.cnn.com/2013/02/20/office-brain-health-smartphones/>.

Rock, D. (23 October 2013). Why organizations fail. *Fortune*. Retrieved from <http://management.fortune.cnn.com/2013/10/23/managers-social-skills/>.

Rock, D. and Schwartz, J. (Summer 2006). The neuroscience of leadership. *Strategy + Business*, Issue 43.

Scarlett, H. (14 February 2014). Bringing neuroscience to employee engagement. *simply-communicate.com*. Retrieved from <http://www.simply-communicate.com/news/top-tips/employee-engagement/neuroscience-bringing-science-employee-engagement>.

Turturici, D. (n.d.). Neuroscience sheds new light on change management strategies. *BPMInstitute.org*. Retrieved from <http://www.bpminstitute.org/resources/articles/neuroscience-sheds-new-light-on-change-management-strategies>.

VanDerWalt, R. (n.d.). What business can learn from neuroscience and the development of neuroleadership. *HRfuture*. Retrieved from <http://www.hrfuture.net/on-the-cover/neuroscience-now-helps-develop-leaders.php?Itemid=33>.

Waytz, A. and Mason, M. (July/August 2013). Your brain at work. Cambridge, MA: *Harvard Business Review*.