

ORGANIZATIONS & PEOPLE | December 5, 2016 / [Summer 2017 / Issue 87](#)

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# The neuroscience of strategic leadership

**Research shows how leaders can take the high road less traveled. See also "[How Strategic Leaders Use Their Brain.](#)"**

by [Jeffrey Schwartz](#), [Josie Thomson](#), and [Art Kleiner](#)

*A version of this article appeared in the Summer 2017 issue of strategy+business.*

Have you ever had a difficult executive decision to make? This is the kind of decision where the best options aren't obvious, the ethics aren't clear, and the consequences could affect hundreds of people or more. How do you figure out the right thing to do? More importantly, how do you develop the habit of making better decisions, time and time again, even in difficult and uncertain circumstances?

Neuroscientists and psychologists are beginning to learn what happens at moments of choice inside the human mind (the locus of mental activity) and the brain (the physical organ associated with that activity).

If you understand these dynamics and how they affect you and those around you, you can set a course toward more effective patterns of thinking and action. You can replicate those beneficial patterns, at a larger scale, in your organization. Over time, this practice can help you take on a quality of strategic leadership: inspiring others, helping organizations transcend their limits, and navigating enterprises toward lofty, beneficial goals.

For example, consider the case of a human resources director for a regional professional services organization, a linchpin in its local economy. (We have permission to tell this story, but we cannot use the real



Illustration by James Yang

name of the company or the individual.) "Natalie," who is in her 40s, reported directly to the CEO. When the firm hit a long stretch of dwindling revenues, Natalie had ideas for turning things around, but she wasn't included in strategic conversations. Instead, all personnel issues – including sexual harassment cases, bullying claims, and layoffs – were delegated to her. One year, she had to move the firm's financial accounting staff offshore. About 30 local people lost their jobs. It was a painful but necessary decision that allowed the firm to survive.

## How Strategic Leaders Use Their Brain

### How Strategic Leaders Use Their Brain



Neuroscientists are learning how executive decision-makers can use their minds to transform organizations.

Stress took its toll. For years, Natalie worked 70 hours or more per week. Her marriage was on the rocks, she came to work anxious, and she lost the ability to hide her chronic irritation. As a result, her performance reviews slipped. She felt herself panicking: *If this goes on much longer, I won't be able to cope, and I'm going to lose my job.*

Fortunately for Natalie, there were people, including an executive coach, who helped her see what was happening. First haltingly, and then with growing enthusiasm, she adopted a regimen of practices that included mindfulness. Every day, soon after arising, she spends a half hour alone, focusing her attention on the deceptive brain messages that underlie her stress. For instance, she knows she tends to see everyone

but herself as prone to error. *Most people are screw-ups, and need to be tightly managed.* She has also felt at times that the firm's leaders don't respect her. *I'm just the head of HR, and the real work happens in sales and finance.* She used to assume these were accurate statements of reality; now, she has relabeled them simply as brain messages, which she can observe dispassionately as they rise into her awareness.

As she reflects, she reframes these messages, choosing alternative ways of looking at her situation. These don't come out of thin air; she practices thinking through the firm's problems – sometimes in areas she knows well, such as recruiting and training, but also in less familiar domains, such as mergers and growth – and proposing strategic approaches. She refocuses her attention on these alternatives, returning again and again, for example, to ways in which she could make a valuable contribution. Before any major meeting, she thinks about how the various leaders of the company might respond to the points she will make. As she makes critical decisions, she reminds herself to pay attention to the way others respond and follow up. In all this, she calls upon a construct that she has developed in her mind: a "Wise Advocate," like a disinterested observer whom she can consult for guidance and perspective.

Natalie began this discipline around 2013 and it gradually affected the way she spoke and the things she said. She is now regularly invited into conversations about strategy. When there is a possible crisis, people turn to her first, as if she were a Wise Advocate for the larger enterprise. The company's prospects have turned around – in part because of opportunities she has pointed out – and instead of laying people off, she's now recruiting. She has also reduced the amount of oversight and number of approvals in the HR function; she no longer has to work 70 hours per week.

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Natalie made a deliberate transition, from a harassed functionary bent on pleasing her bosses to an influential leader.

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You might think this is just standard good management practice, nothing special. And you may well be right. But it was beyond Natalie's skill four years ago. She made a deliberate transition, from a harassed functionary bent on pleasing her bosses to an influential leader with strategic perspective. The potential for this change was there all along, but nothing external – no incentives, rewards, threats, or "burning platform"-style pressure – could force her into it. The leverage came from transforming her thoughts. By refocusing her attention, she became the kind of leader needed in that company at that time.

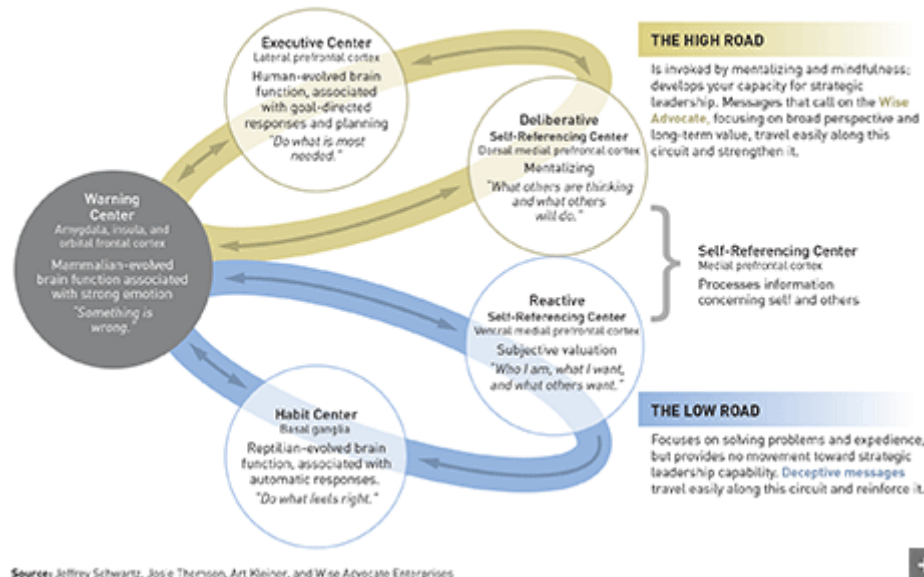
# The Power of Focusing Attention

The shift that Natalie made was conscious, pragmatic, and replicable; anyone reading this can make it too. Her story exemplifies a hypothesis about the way people become effective leaders of large organizations, especially at times of turmoil and change. This hypothesis suggests that better, more strategic leadership can be developed by combining two often-misunderstood cognitive habits: mindfulness (clear-minded awareness of one's own mental activity) and mentalizing (paying close attention to what other people are thinking and are likely to do next). For all its complexity, the wise leadership hypothesis, as we sometimes call it, can be boiled down to one core principle: *The focus of your attention in critical moments of choice can build your capacity to be an effective leader.*

In most business decisions, you are likely to focus your attention in one of two basic ways. Exhibit 1 shows them in schematic form. We call one pattern of mental activity the Low Road, because it favors expedient actions aimed at giving you what you want and giving others what they want, as rapidly and efficiently as possible. The other pattern, the High Road, often manifests itself as the mental construct we call the Wise Advocate: a voice within the mind, making the case for fundamental solutions with longer-term and broader benefits. The Low Road is tactical; the High Road is strategic.

## Exhibit 1: High Road and Low Road

These two recurring patterns of mental activity have close relationships with their associated brain circuits. The named centers represent functions of the brain, and the descriptions in italics represent associated mental activity.



As it happens, these two patterns of mental activity are associated with two aspects of the prefrontal cortex – dorsal (higher) for the High Road and ventral (lower) for the Low Road. When people hold their heads upright, the dorsal area sits above the ventral area in the brain. This is one reason that the names High Road and Low Road seem apt to us. Because they link mental activity and brain circuits, both the High Road and the Low Road are habit forming. If the wise leadership hypothesis is true (and it is consistent with current

knowledge about neuroscience, psychology, organizational research, and ethics), then the relationship between them illuminates the source of strategic leadership.

The interaction between mind and brain is central to this hypothesis. When experimental subjects are encouraged to pay attention in particular ways, certain areas of the brain demonstrate observable activation, often in the form of blood flowing to those parts of the brain. Thus, for example, when people are shown a frightening picture, the amygdala is activated in a way that is made visible by functional magnetic resonance imaging (fMRI) scans. This activation is physical and passive. People do not consciously choose the emotions they experience and the activations that arise in the brain.

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The catalysts for strategic leadership are two often-misunderstood habits: mindfulness and mentalizing.

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But brain activity is not the same as mental experience. Mental activity, although often associated with a physical circuit in the brain, also has a distinct existence. Evidence for this includes the fact that when people experience brain damage and receive training intended to refocus the injured person's attention, the functions of those damaged areas can relocate to other parts of the brain. Further evidence comes from the fact that solutions to mental problems, such as addiction, depression, and obsessive-compulsive disorder, often elude or resist purely physical ways of addressing them. In addition, the mind is active

in a way that the brain is not. You can choose where to focus your attention, and your choices, made in the mind, will eventually affect the physical makeup of your brain. This phenomenon is called self-directed neuroplasticity.

Canadian scientist Donald Hebb discovered one of the core principles of neuroplasticity in the 1950s. He summarized his findings with a phrase now known as Hebb's law: "Neurons that fire together wire together." In other words, parts of the brain that are continually activated together will physically associate with one another in the future. The more frequently a pattern of mental activity occurs in your mind, the more entrenched the associated neural pathway becomes in your brain, and the easier it becomes to follow that same pathway in the future – in fact, it can become totally automatic.

This process is loosely analogous to the way a powerful search engine works. When you search Google, for example, for a particular term or phrase, the software takes note. It also tracks the results that you click on and records your selection of the items presented to you. The next time you use the Google search engine, it will feature more prominently the terms and results that you chose before, because it is designed with the assumption that this is closer to what you want. You get more of what you've already looked for; the results in your future echo the choices of your past.

In a somewhat similar way, your brain circuits are strengthened by the choices you make about where and how to focus your attention. That's how addiction and obsessive-compulsive disorder, among many other human frailties, gain much of their power. But it is also possible to consciously use self-directed neuroplasticity to train your brain toward more constructive ends, and toward a stronger leadership role. At first, the Low Road is more comfortable; the High Road is indeed a road less traveled. But as you learn to make choices that favor the High Road in your mind, those choices strengthen the related circuits in your brain. This makes it easier to stay on the High Road, and gives you greater facility and sophistication for leading others.

## Cruising the Low Road

Life today is a constant barrage of challenges. We have promises to fulfill, problems to solve, tests to pass, and situations to manage. The Low Road is the pattern of mental activity, and the related brain circuits, involved in meeting these challenges in an expedient way. When you make deals, design rewards and incentives, or think about satisfying your needs or the needs of others in your organization, you are probably on the Low Road. This activity often elicits powerful emotions, such as desire, anxiety, fear, frustration, elation, and relief. In everyday workplace life, most of us occupy the Low Road most of the time.

The Low Road connects three major functions of the brain. We call the first the Reactive Self-Referencing Center; it is associated with the ventral medial prefrontal cortex (vmPFC). This center is spontaneously activated when there are thought processes or sensory stimuli perceived as primarily related to the self. Low Road activity is also known as "subjective valuation": It is concerned with what is valuable and relevant. *What's in it for me? How much is it worth? How might we close the deal? What might others want?* Though powerfully related to incentives of various kinds, these are not purely selfish concerns; for example, the Low Road is involved when you observe others being rewarded.

It is important to note that the Reactive Self-Referencing Center is just half of a larger system called the Self-Referencing Center (associated with the entire medial prefrontal cortex). As we'll see, the other half (the

Deliberative Self-Referencing Center) is a key element of the High Road. The overall Self-Referencing Center is involved in many aspects of your personality and identity, especially in the way you perceive yourself and relate to others. It correlates with your inner monologue: the voice inside your mind that thinks about people, articulates your hopes and fears, daydreams about the future, and interprets experience. When you're on the Low Road, this inner monologue will be oriented to yourself; as we'll see later, it's different on the High Road, which is much less prone to subjective valuation.

The second function of the Low Road is the Warning Center. It is associated with three parts of the brain: the amygdala, insula, and orbital frontal cortex. This center generates feelings of fear, gut-level responses, and the sense that something is worth pursuing or avoiding. Anxious feelings of impending danger (especially those related to the experience of past threats) can activate this center with such intensity that they override all other thinking and response. *Emotional Intelligence* author Daniel Goleman calls that phenomenon the "amygdala hijack." (As we'll see, the Warning Center is also associated with the High Road.)

The third major brain function on the Low Road is the Habit Center. This function, typically associated with the basal ganglia (which are located deep within the base of the brain), manifested itself early in animal evolution. (It is sometimes called the "lizard brain.") The Habit Center manages automatic thoughts and actions – basic behaviors that don't generally require conscious attention because they have become automatic through repetition. These are actions such as walking up stairs, locking the door, brushing your teeth, and steering your car. Making use of this center is the subject of Charles Duhigg's bestseller *The Power of Habit* (Random House, 2012).

Some gifted and charismatic, albeit narcissistic, leaders are extremely skilled at traveling the Low Road. They can "read a room" and "give the people what they want," powerfully and decisively, and they thus come across as masterful competitors. Former GE CEO Jack Welch titled one of his books *Straight from the Gut*, a reference to the power of signals from this circuit. But though they tend to feel true, these signals aren't necessarily accurate. Deceptive brain messages frequently arise from the Low Road, ranging from all-or-nothing thinking (*You're either a winner or a loser in this company*) to complacency (*Our big customers have nowhere else to go*). Natalie's chronic worries (*I will never be taken seriously as a leader of this enterprise*) were deceptive Low Road messages. So are many other messages of expedience, including rationalizations for crossing an ethical line (*No one will notice if we manipulate these numbers*).

The Low Road is familiar and emotionally powerful in business because it has real value there. *What would consumers pay for our product? What bonus will our employees accept? What does my boss want, right now? What must I produce by next quarter? How should we price our stock?* Questions like these trigger the Low

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Some gifted and charismatic leaders are extremely skilled at traveling the Low Road.

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Road, and your career may prosper if you answer them shrewdly. But business leaders who spend most of their time on the Low Road are unlikely to break free of the conventional wisdom of their industry. Strategic insights – considerations of the purpose of the enterprise, and the long-term value it brings to the world – are more likely to emerge when you travel the High Road.

## Leading on the High Road

The 18th-century economic philosopher Adam Smith, best known for his foundational book *The Wealth of Nations*, spent his last two decades considering the problem of virtue in capitalism. The vitality of the industrializing world was based on the good faith of energetic, creative people, acting individually. But no human society had ever resisted the temptations of corruption and exploitation. How would capitalism survive? Smith said that the two obvious means, legal regulations and community censure, were not completely adequate, because they were often ill-placed, bore enormous costs, reduced productivity, and diminished entrepreneurial vitality. Yet what else could hold the inevitable waves of robber barons in check?

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Strategic insights are more likely to emerge when you travel the High Road.

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Smith's other famous work, *The Theory of Moral Sentiments*, first published in 1759 and significantly expanded in 1790, proposes a solution principally based on what he called the “impartial spectator.” Our Wise Advocate closely resembles his solution. That voice within the mind is oriented not just to your desires, needs, and success, but to the overall long-term value of the entire system. It has the dispassionate perspective of a clear-minded observer, helping you see yourself and your actions

as others might see them. It may not be obvious, but it is always there, an inner source of guidance ready to be cultivated; when you act with it in mind, you stop looking for the most expedient outcome or trying to make everyone happy. You don't necessarily want to make anyone *unhappy* in the short run, but if that is a requisite part of a longer-term, broader-based positive outcome, you are willing to consider it.

This type of mental activity is typical of the High Road. Like its Low Road counterpart, the High Road connects three major centers of the mind and their associated brain regions. The first is the same Warning Center function that links to the Low Road, associated with the amygdala, insula, and orbital frontal cortex. Thus, the High Road also channels feelings of urgency.

Second, instead of the Reactive Self-Referencing Center, the High Road connects to a function we call the Deliberative Self-Referencing Center. This is associated with the dorsal (upper) medial prefrontal cortex (dmPFC), a brain region above the vmPFC. The Deliberative Self-Referencing Center is activated by consideration of what others are thinking and evaluations of what future actions they might perform. *What is he thinking? What is she thinking? What will they do next?* are High Road questions.

The third function on the High Road is the Executive Center, associated with the lateral prefrontal cortex. Working memory, the ability to keep information accessible so your conscious attention can work with it, is located in this center. When you reflect on your most meaningful aspirations, and plan how you might bring those changes to pass, you generate activity in the Executive Center. This center is also associated with cognitive flexibility: the ability to see a situation from multiple perspectives and act according to the potential and subtle connections among them. Finally, this part of the brain is the home of self-regulation, or the inhibition of habitual and impulsive behaviors. Columbia University research psychologist Walter Mischel, the creator of the “marshmallow test” experiments, which linked children’s ability to self-regulate with success later in life, credits the Executive Center as the source of this all-important attribute.

Brain research on the High Road is still evolving, and its implications are still being explored. It seems likely that the High Road is often triggered when one is thinking about people in abstract terms, studying them as an anthropologist might. You don’t have to be entirely accurate in your perception of others’ thoughts, motives, and future actions; just inquiring about and reflecting on what they’re thinking or what they’re likely to do will trigger the High Road. If the Low Road is concerned with subjective value, the High Road is concerned with genuine worth: whether something is important enough to deserve close, sustained attention.

By linking it to the High Road, our hypothesis suggests that the Wise Advocate is not just a metaphor. It represents a real, recurring mental phenomenon. When you repeatedly pay attention to it, because of self-directed neuroplasticity, you will tend to rewire the pathways of your brain in ways that significantly enhance your perspective. The most accomplished leaders, from the earliest human history up to today, have appeared to understand this. By managing their attention to achieve more significant goals, they move their mind more frequently onto the High Road, and they strengthen their Wise Advocate accordingly.

## Mentalizing and Mindfulness

The Low Road and the High Road are both oriented toward achieving goals; they're both somewhat concerned with how you make your way in the world. They can sometimes be hard to tell apart. And yet the switch between them can make all the difference to your ability and success as a leader.

How, then, can you develop that capacity – in yourself and in your organization? Two mental activities seem to evoke the High Road. The first practice, mentalizing, has also been called *theory of mind*. When you mentalize, instead of focusing on the desires and problems around you (and whether you need to intervene), you consider people more dispassionately, trying to figure them out, as if they were characters in a novel or film. *What makes them tick? What will they do next? What are they really thinking about, and why?*

Social neuroscientists have studied mentalizing in some detail. In typical experiments, people are asked to look at groups of pictures illustrating simple stories, or to read passages describing simple situations. Then they are asked to explain the behaviors in the pictures and stories. This exercise, designed to trigger mentalizing, consistently activates the Deliberative Self-Referencing Center, which is part of the High Road circuit. Some people have an easier time with it than others; people who are skilled at it develop a more nuanced, sophisticated understanding of other people that helps them manage others effectively. Emily Falk of the University of Pennsylvania has also found that activity in brain areas associated with mentalizing is correlated with ideas that become influential.

Considering the benefits of mentalizing, you'd expect executives to eagerly pursue it as a path toward leadership. But they often don't. The people who mentalize most frequently – those who are, as one study puts it, "more likely to engage in social cognitive processes that aid in understanding how others think, feel, and behave" – tend to perceive themselves as low-status individuals. For example, people who have a job that requires serving others (such as assistants, caretakers, and salespeople) tend to consistently mentalize about higher-status individuals. One could argue that some jobs are considered low-status precisely because the job holders are expected to mentalize about their customers, investors, bosses, and everyone else, while no one pays attention to them. It takes mental strength to be a good mentalizer. It's hard work, so it's easy to see why some people stop doing it when they rise to a position of influence. They feel they've paid their dues.

And yet for aspiring leaders, mentalizing becomes even more important as they rise to higher levels of responsibility and authority. Some of the most effective senior executives have a well-developed ability to mentalize. They can articulate what other people are thinking, what those people intend to do next, and why

it is important. They give the impression of genuinely caring about what other people think, because of the intensive, high-voltage way they pay attention in conversation.

But that is not enough, in itself, for consistent High Road leadership. The other necessary practice is mindfulness. Millions of people have been exposed to this basic practice in the context of meditation. You sit in a comfortable but upright position, your spine straight, perhaps with your legs folded. You draw your attention to some regular aspect of your experience – in one common and extremely beneficial form, you focus your attention on your breathing. Each time your mind wanders on a tangent, you catch yourself, and bring your attention back to your breath. As you do this regularly, you develop new cognitive skills. For example, you gain an enhanced awareness of thoughts moving through your mind. This practice also induces self-directed neuroplasticity; it changes your brain.

Wendy Hasenkamp, currently the science director of the Mind & Life Institute in Massachusetts, conducted research at Emory University in which this basic breathing exercise brought people to the Executive Center function and thus to the High Road (specifically, in the brain, to the dorsal part of the lateral prefrontal cortex). But when their minds inevitably wandered – when they started thinking about the day's activities, obligations, hopes, fears, or anything other than their breathing – the brain scans showed activity in the ventral medial prefrontal cortex, associated with the Low Road. When they returned to focus on their breathing, as meditators are trained to do, their mental activity returned to the High Road (see *Exhibit 2*).

## Exhibit 2: Mindfulness and the High Road

Two brain fMRI images from research by Wendy Hasenkamp and her colleagues show how mindfulness may correlate with activity related to the High Road and Low Road. Each is a composite brain image from subjects performing a breath awareness exercise classically associated with mindfulness. The top image shows brain activity during a "focus" period when the subjects paid close attention to their breathing. The yellow highlights a key brain area associated with the Executive Center and the High Road. The bottom image shows brain activity during a "mind wandering" period, when the subjects' minds took on thoughts unrelated to the mindful attentive state. Activated areas include the ventral medial prefrontal cortex (in blue), a key brain area associated with the Reactive Self-Referencing Center and the Low Road.



### Sustained Focus of Mindful Attention

Dorsal lateral prefrontal cortex, associated with the High Road



### Mind Wandering

Ventral medial prefrontal cortex, associated with the Low Road

**Source:** Wendy Hasenkamp et al., "Mind Wandering and Attention during Focused Meditation: A Fine-Grained Temporal Analysis of Fluctuating Cognitive States," *NeuroImage*, July 2011

Hasenkamp's research on focused attention, and other research on mindfulness, has helped explain why these practices are linked with stress reduction, and with increased emotional intelligence. In general, mindfulness appears to enhance the connection between the Executive Center and the emotion-based Warning Center, to enhance people's ability to disengage from Low Road thoughts and feelings, and thus to strengthen the High Road.

When you combine mindfulness and mentalizing – to the extent that both practices become routine for you – you begin to mentalize about yourself. *What am I likely to do? What am I really about? Why am I thinking this*

way? These questions, strongly linked to the High Road, may be closer to authentic leadership than questions typically associated with authority: *How will we fix this problem? Who can we bring on board with us? How will I triumph?*

As a leader, you may already consult your Wise Advocate quite a bit. But unless you're quite unusual, the Low Road in your brain is much more active than it needs to be. The more you use your mind to shift activity from this circuit to the High Road circuit, the more effective you will be as a leader. You may, like Natalie, feel called upon to play a more visible leadership role within your organization. And with application of the principles described here, you can provide the same kind of guidance for the enterprise that the Wise Advocate provides for your own mind.

Invoking the High Road is not a miracle practice. It is not a sure path to wealth, success, promotion, or any other material or social benefit. But it seems to be a reliable process for building your leadership acumen. You may experience this as the development of an inner dialogue that makes you more aware of beneficial opportunities, more likely to act on them, and more able to do so. With regular practice, it can become habitual for you to step back and look at any situation – in your organization or in your personal life – with a Wise Advocate frame of mind.

Reprint No. 17211

### Author Profiles:

**Jeffrey Schwartz** is a research psychiatrist at the University of California, Los Angeles, and the author or coauthor of three bestsellers: *Brain Lock* (HarperCollins, 20th-anniv. ed., 2016), *The Mind and the Brain* (HarperCollins, 2002), and *You Are Not Your Brain* (Avery, 2011). He was the first scholar to identify self-directed neuroplasticity and attention density, terms that he coined, as means of making personal and organizational changes.

**Josie Thomson** is an independent, award-winning leadership coach based in Brisbane, Australia. A two-time cancer survivor, she has worked closely with Schwartz and developed a leadership coaching practice based on neuroscience principles.

**Art Kleiner** is editor-in-chief of *strategy+business*. He has been working with Schwartz and Thomson to research and articulate the concepts underlying this article since 2008.

This article is derived from a book in progress, to be published by Columbia University Press.

### Resources

Emily Falk et al., "[Creating Buzz: The Neural Correlates of Effective Message Propagation](#)," *Psychological Science*, May 2013: Links mentalizing (and the dorsal medial prefrontal cortex, associated with the High Road) to the ability to influence others.

Shihui Han and Georg Northoff, "Culture-sensitive neural substrates of human cognition: a transcultural neuroimaging approach," *Nature Reviews Neuroscience*, 2008: Articulates features of the Self-Referencing Center and its functions.

Ryan Patrick Hanley, *Adam Smith and the Character of Virtue* (Cambridge University Press, 2009): A guide to the moral and political philosophy of capitalism's founding father, exploring his ideas about virtue in a market age (including the impartial spectator concept).

Wendy Hasenkamp et al., "Mind Wandering and Attention during Focused Meditation: A Fine-Grained Temporal Analysis of Fluctuating Cognitive States," *NeuroImage*, July 2011: Explorations of the impact of mindfulness.

Walter Mischel, *The Marshmallow Test: Mastering Self-Control* (Little, Brown, 2014): Overview of research by Mischel and others on the executive function of the brain, which is strongly linked to the High Road.

Keely Muscatell et al., "Social Status Modulates Neural Activity in the Mentalizing Network," *NeuroImage*, Jan. 2012: Suggests that mentalizing activity increases for people who perceive their status to be lower.

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