

# The Brains Behind Breakthrough Strategies

by

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## **Part 1: Getting Past Go**

In my new book, *Get Out of Your Own Way*<sup>1</sup>, I explore some relationships between how our brains work and our ability to achieve all we want from our professional and personal lives. Here I apply that same kind of analysis to considering how organizational leaders can create and implement breakthrough strategies. I deal with the creation of such strategies here; I address their implementation in part two.

### **So Many Try, So Few Succeed**

"The brain is a wonderful thing," wrote the poet Robert Frost. "It starts working the moment you get up in the morning and does not stop until you get to work." He was more right than he knew.

In every generation of business leaders, there are a handful who create the kinds of breakthroughs that transform their industries, change the rules of the game, and give their companies advantages that competitors spend years trying to undo. Those leaders – from Henry Ford to Estée Lauder to Jack Welch, Michael Dell, and Howard Shultz – are hailed as “visionaries” or “geniuses.”

But the real question is not how those few executives achieved open-space breakthroughs<sup>2</sup>, it's why so many executives do not. It's not for lack of exhortation, not even for lack of tools. Every few years a new strategy bestseller lays out concepts and tools explaining what can be done to change everything. Gary Hamel's *Competing for the Future*; James Collins' *Built to Last* and *Good to Great*; Michael Porter's various works on strategy; Peter Drucker's sage advice; Tom Peters' blockbusters; and now *Blue Ocean Strategy* – all those works have sold millions of copies and been greeted, appropriately, as major contributions to the collective wisdom about how a company can thrive where others struggle.

Since there's no lack of inspiration, ideas, and analytical tools for executives who want to break away from the pack, and there's certainly no lack of business and personal incentive for doing so, maybe it's time to look someplace else in order to understand why so few do, and maybe it's time to start someplace else in building the individual and organizational capacity for transformative change.

How about starting where it all begins, in the brain? My three decades of work with leaders and teams around the world have persuaded me that, for most people, until the brain's power to obstruct new thinking is understood and addressed and its power to spur innovation is consciously tapped, breakthroughs will always be more a result of luck and timing than something that can consciously be created.

Here I'll address three aspects of brain functioning that dramatically affect individual and team performance, and then I'll describe some methods that have been employed to overcome the brain's limitations and build on its extraordinary powers. Those three aspects are as follows:

1. The remarkable, hidden power of the *amygdala* to obstruct any constructive thinking about anything that might bring about change;
2. The way our future-oriented brain centers, particularly the *forebrain*, atrophy when they're not effectively exercised; and
3. The underused capacity of *real brains* outside our heads – in our guts, our hearts, and our spines – to create breakthroughs that the thinking brain cannot imagine.

## Driving with the Brakes On: The Amygdala and Strategic Thinking

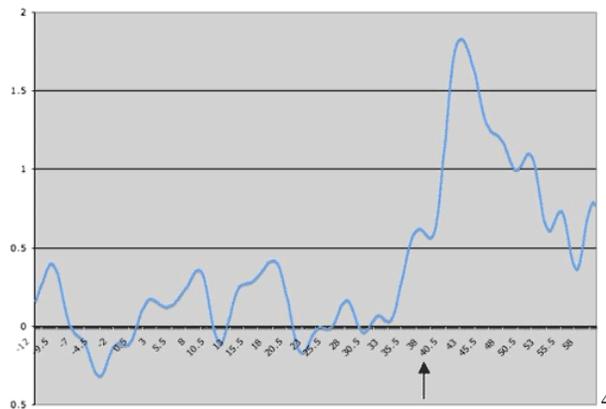
Have you ever driven a short distance in a car, noticed the smell of burning rubber, and suddenly realized that the emergency brake was still engaged? In some ways, that's the fate of most people seeking open-space breakthroughs: you're trying to move forward, but your amygdala is holding you back. The problem is that since there's no warning odor of vaporizing rubber, we're usually unaware of why we're not moving as fast as we thought we should.

Put simply, the amygdala is a powerful fear center in your brain, whose primary role is to keep you from doing anything that might expose you to any kind of risk. That's an evolutionary feature that served the valuable purpose of keeping our ancestors alive, but which today causes us to pull back – often unconsciously – from all forms of change and newness<sup>3</sup>.

You can't go very far toward imagining a business or personal breakthrough when your brain refuses to cooperate, especially when you don't even realize that that is happening. A simple study performed by brain scientists during the 2006 Super Bowl demonstrates the stubborn grip the amygdala can have on our thoughts.

The scientists wired some people up as they were watching commercials aired during the Super Bowl. In one of the commercials, a caveman is reprimanded by his caveman boss for not using Federal Express to ship an important package. The reprimanded caveman complains, "But FedEx doesn't exist yet." The boss responds, "Not my problem." As the reprimanded caveman walks away in disgust, he kicks a small dinosaur out of his way – and then is crushed when he's stepped on by a very big dinosaur.

Many people describe this ad as "funny" or "cute," but it's not that way to the amygdala. As the chart below shows, there's a dramatic spike in amygdalar activity among viewers, indicating intense fear or threat, when the caveman gets crushed (as indicated by the black arrow).



In this case, the image of something that could not possibly happen, and which was presented not as threatening but as cute and funny, nevertheless set off wildly-ringing alarm bells in subjects' minds. How much more alarm would there be as you start thinking about an open-space breakthrough, which by its very nature involves novelty, uncertainty, change, and the possibility of failure – all of which represent threat and danger to your amygdala?

## **“More,” “Now,” and Our Withering Forebrains**

Large parts of our brains are dedicated to the amazingly complicated tasks that are performed every second of the day with amazing ease: translating airwaves that bounce off our eardrums into “sounds” that we recognize and understand; translating rays of light into “images”; getting our limbs to do what we want when we want them to; deciding what to do right now; and so on. If you are blessed with having most of your brain parts functioning the way they're supposed to, you can easily take for granted how much processing power goes into serving those basic functions.

Only some relatively small brain areas are dedicated to thinking about the future, and it's easy to see how those areas can be overwhelmed by the demands of the here and now. In particular, parts of your forebrain (which is located behind your temples) house your ability to think into the future and envision it as you would like it to become.

If you don't regularly engage your forebrain, it backs off, and even stops altogether and actually atrophies, as brain areas can do when they are not being fully engaged<sup>5</sup>. Then your other brain circuitry fills the void, leaving you even less able to imagine and pursue your best future. There's a general rule here that I call the Brain Displacement Principle, which is generally summed up in Bob Dylan's famous axiom “He not busy being born is busy dying”:  
If you are not deliberately using your most useful brain areas to move you forward, then your least useful ones will probably take over.

So fragile is this balance when it comes to your forebrain that you can permanently lose the capacity to truly envision a future for yourself in any but the most wishful and fantastical ways: one day that capacity just vanishes, along with your ability to realistically plot a way from where you are now to someplace you want to be in the future. You can still follow all the rules that are programmed into you, you just can't dream of something new and make it happen.

In today's world, when “more” is always the watchword and “now” is usually the answer to when, fewer and fewer of us have the luxury of truly thinking ahead. In a world where closed space and not open space is the rule, the forebrain doesn't get much of a workout. In a world where fear and anxiety seem to have driven out so much of our natural playfulness and imagination, thinking ahead will start those amygdalar alarm bells ringing with the warning that this is no time to divert your attention from what's right in front of you.

How often do you pause to really think five years ahead? What about the other people in your organization? Is it possible that your forebrain has lost some of its robustness?

## **Keeping Your Head, Losing Your Way**

One of the most dramatic business stories of our time illustrates the limitations of the kind of thinking that executives often believe they get paid for. It involves two brilliant, successful people who somehow missed what was right in front of them. If Walt Disney Company CEO Michael Eisner and his very good friend Michael Ovitz had only listened to what their

instincts were saying – saying loudly and clearly – Disney would have been spared some huge financial losses, each man would have been spared serious embarrassment and career damage, and their friendship might still be intact.

Ovitz, the talent agency dynamo whom the Wall Street Journal had called the most powerful person in Hollywood, went to work for his friend Eisner in 1995 as Disney's president. The two had been close friends for many years; their families often spent holidays together; their wives were also best friends. When Eisner became convinced that he needed a powerful, trusted second-in-command, he offered the job to Ovitz. Because the balancing of so much power at such a high-profile corporation among two successful and ambitious individuals was very hard to put into words, the two men eventually agreed to proceed as much on trust as on delineated roles, responsibilities, and authorities. As they came closer to a working arrangement, Ovitz told his friend Eisner, "I'm putting myself in your hands."<sup>6</sup>

Moments after hearing those words from Ovitz, Eisner called a business associate and said, "I think I just made the biggest mistake of my career." The next evening, after meeting with some Disney executives at Eisner's home, Ovitz said to his wife, "I just made the biggest mistake of my career."

But still they went ahead, and the formal hiring of Ovitz was announced with fanfare at a press conference a few weeks later. Within less than a year and a half, Eisner fired Ovitz, who received a hundred and forty million dollars in settlement. Disney shareholders sued the company's directors; some Disney board members turned against Eisner in unusually virulent and public ways; the company's stock languished; Eisner eventually was forced to announce his early retirement. As for Ovitz, New Yorker reporter James B. Stewart says, "The career of the man known as the most powerful individual in Hollywood was effectively destroyed."<sup>7</sup>

Their hearts and their guts were telling Eisner and Ovitz that something was wrong, but – being smart, accomplished fellows – they let their head brains override the greater wisdom that was coming from elsewhere inside them. They thought they were smarter than the truth.

Maybe you're better at heeding your instincts than Eisner and Ovitz were in that circumstance, but in this information age more and more executives are relying more and more on numbers and data and less and less on intuition. That may be good business practice a lot of time, but it can close you off to the other kinds of intelligence that often lead to strategic insights and open-space breakthroughs.

We have true brains – real brains, not "brains" in quotes – in our hearts and our guts (and probably in our spines, too, though I won't discuss that here). The gut brain, or enteric nervous system, includes more than a hundred million specialized nerve cells, a complex circuitry that enables it to act independently, learn, remember, and influence our perceptions and behaviors.<sup>8</sup> And the heart brain consists of more than 40,000 neurons along with a complex network of neurotransmitters, proteins, and support cells. It's as large as many key areas of the brain in your head.<sup>9</sup>

Those brains are amazingly fast at sensing risk and opportunity, and they perceive and calculate options and alternatives much more quickly – by some accounts, as much as a million times faster – than the brain in your head does.<sup>10</sup> There's a reason why we talk about "gut instinct," or about things we know in our hearts.

Over time, routines of living almost solely from the head have taken hold in nearly all of us and we have come to believe that rationality requires the exclusion of feelings from our

thoughts and decisions.<sup>11</sup> In fact, exactly the opposite is true: we are built to reason using practically everything inside us. The gray matter in our craniums is amazing – it’s just less than all we need to do all that we can, as well as we can, particularly when it comes to the demands of open-space thinking.

To say “Let’s leave feelings out of this” while making a decision is not much different from saying “Let’s leave chewing out of this” with regard to your digestive system or “Let’s leave the ankles out of this” when you’re walking. You can do it, but you’re not using the system the way it was intended.

## Opening Your Brain to Open-Space Thinking

For all that I have told you about the brain’s limitations and the ways in which we create additional limitations on its extraordinary capabilities, recent discoveries have shown that our brains are also capable of remarkable transformations. You can, in effect, train your brain to help you find open-space breakthroughs.<sup>12</sup>

Scientists have recently confirmed the presence of “mirror neurons” throughout our brains. Those neurons fire up when we see someone else doing something or even think about doing it ourselves, building pathways in the brain for the times when we might actually do the thing we’ve been observing or thinking about. Mirror neurons have amazing implications for explaining certain qualities that are unique to humans, like the development of language and the experience of empathy,<sup>13</sup> but more importantly for our purposes here, you can use them to get your brain primed for open-space breakthroughs, as I’ll discuss below.

The extent to which we can train our brains to serve our interests is also shown by a related phenomenon, called neuroplasticity. Until very recently scientists doubted that the overall shape of the brain – as opposed to the circuitry within it – could actually be changed by brain “exercise.” Yet that has now been conclusively demonstrated to happen: parts of the brain that we call on frequently can grow larger and more capable. Here are reports on two studies that show that:

From *The New York Times*: “Brain scans of London cabbies showed that the detailed mental maps they had built up in the course of navigating their city’s complicated streets were apparent in their brains. Not only was the posterior hippocampus – one area of the brain where spatial representations are stored – larger in the drivers; the increase in size was proportional to the number of years they had been on the job.”<sup>14</sup>

*The Wall Street Journal* reported that brain scans of Tibetan Buddhist monks showed that the brains of monks who had spent many hours in meditation had acquired a far different structure than the brains of monks who were novice meditators: “[A]ctivity in the left prefrontal cortex (the seat of positive emotions such as happiness) swamped activity in the right prefrontal (site of negative emotions and anxiety), something never before seen from purely mental activity. A sprawling circuit that switches on at the sight of suffering also showed greater activity in the monks.”<sup>15</sup>

The presence of mirror neurons and your brain’s neuroplasticity mean that even small changes in your daily habits can make big differences in your ability to see and seize open-space opportunities.

## Training Your Brain

All the great strategy books provide useful analytical tools for summoning up strategic breakthroughs: there's the three-circle analysis in *Good to Great*, the "strategy canvas" in *Blue Ocean Strategies*, and matrices galore in Michael Porter's books, to name some.

But, as a Harvard professor recently wrote, "much of what happens in the brain is not evident to the brain itself."<sup>16</sup> Your quest for open-space breakthroughs can be stifled, without you even realizing it, by an unchecked amygdala, an underutilized forebrain, or disregarded input from the gut and heart brains.

Here I'll describe some of the fundamental practices that can lead to better open-space thinking. Many more are presented in *Get Out of Your Own Way*

*Watch Yourself.* Once you are aware of how your amygdala can hold you back from open-space thoughts and actions, you can start counteracting it. Self-awareness, or what is technically called "third person observation," makes a big difference. Think of yourself as watching yourself, as though you were sitting on your own shoulder, and notice when exaggerated or irrational fears hold you back. The more you notice, the more doing so will become automatic for you, and the more you confront your unproductive thoughts, the more you build new neural circuitry that permits a fresher outlook.

I think of the amygdala as a kind of worrywart, full of pronouncements like "Change is bad!" or "Here's something else for you to worry about!" And I confess that I find talking back to my brain to be a very salutary activity. When my amygdala starts firing up a lot of fears in me, for example, sometimes I just tell it (even though it means well) to pipe down. It's your amygdala after all; it's supposed to work for you. If you feel funny talking to your brain, at least you can recognize, "That's my amygdala, the worrywart, doing its job, getting me all worked up about even imagining anything new or different." With that awareness, you can decide how much heed to pay that one small but very loud brain part, and you can consider accessing other parts that have more positive and constructive things to "say" to you.

It can help to remember what Albert Einstein, author of a few breakthrough insights himself, once wrote: "How many people are trapped in their everyday habits: part numb, part frightened, part indifferent? To have a better life we must keep choosing how we are living."<sup>17</sup>

*Think Farther Ahead.* Your forebrain is stimulated whenever you look into the future – say, five years ahead – or across a distant physical or mental horizon.<sup>18</sup> When you keep glancing into the future and connecting that view with your current actions, you increase activity patterns throughout your brain that keep opening your awareness of better futures.<sup>19</sup>

Create occasions for thinking farther ahead. I use something I call automatic drivers to stay on track. I'll tell you more about them in the second part of this essay, but in essence they're regular routines that cause me to use my brain in ways that I might not otherwise use it. One of my automatic drivers is to step outside every morning before breakfast (even in the dead of winter where I live in Michigan), look to the horizon, and consider how what I do that day will help me move toward the life I want for myself and my family five years in the future.

You can build similar routines into many everyday activities. Facing an inbox full of emails? Before you set about responding, take just a moment to ask yourself something like, “Five years from now, whom would I want to be getting emails (or phone calls) from, and how might I start that future happening at this very moment?” About to enter a gnarly business meeting over some crisis that’s erupted? Just for a few seconds, pause to ask yourself a similar question, along the lines of, “Five years from now, what kinds of business meetings do I want to be in?” You don’t have to worry right now about the hows of making that happen; just pay attention for now to a future you want. You’re flexing your forebrain and making it stronger.

*Just Don’t Do It.* Most executives’ lives are jammed into closed space. They’re run for you by schedules, demands, and expectations: life as one big, self-renewing to-do list. Often there’s a whole lot of what’s called “tense energy” in such a life, fueled by adrenaline, caffeine, stress, and other small bombs of stimulation exploding in your bloodstream. Your brain can get used to that. In fact, it can come to like it because there’s so little opportunity in there for you to venture outside the narrow boundaries of the conventional. But the more your brain accommodates itself to closed-in living, the fewer resources it has to envision open space and find opportunities there.

So take a deep breath and see what you can eliminate from your schedule. To free up time for open space thinking, begin ditching running-in-place activities that – when you look out a year or five years – truly don’t matter much at all. Take a close look at your typical actions throughout a day. Much of what we do is geared to right now or next-hour priorities that are mostly polishing old habits.

If you’re shaking your head right now and thinking that I don’t know the real world, because you really can’t say no to tasks, I’d advise you to think again, and ask yourself how committed you are to discovering open-space breakthroughs. Because when our commitment is deep, we do say no to things that get in the way. When our romantic commitments are deep, we say no to other involvements that might compromise those commitments. When we are financially committed to some goal – buying a home, let’s say – we say no to expenditures that stand in the way of attaining that goal.

We say no to many things in order to be able to say yes to our children, to our spiritual obligations, and even to recreational activities, such as our weekly bowling league or golf game. Heck, we say no to things just so we don’t miss our favorite television shows, even though we probably won’t remember one important thing about those shows a week after we’ve watched them.

When you start making changes like this, it’s important to provide a safety net for the brain’s worrywart tendencies by being clear with yourself that you’re not eliminating all rhyme and reason from your to-do lists, just tossing what matters least. Wherever and whenever tasks don’t engage the best and deepest parts of your heart or spirit, find ways to dramatically cut time, reduce effort, toss them altogether, and stop worrying about it.

Next, find ways to abbreviate what you haven’t tossed away. In my work with a number of leaders at 3M, for example, we explored ways to free up as much as half of the workday – accomplishing everything required by a job or role in half the time it used to take – to re-direct this time and energy so that far bigger goals and innovations became possible. No matter what your job or working situation, there are ways to free up the time and energy to put open space thinking at the heart of your day, every day.

3M's ability to do this has been well documented in recent years,<sup>20</sup> and countless other organizations around the world marvel at how 3M somehow miraculously makes this happen. It's no miracle. And 3M is widely recognized for its culture of breakthrough new ideas. That's no coincidence.

Get Emotional. A related set of areas in your brain tests all your experiences and decides which ones it would like you to repeat and which ones it would like you to avoid, and it stores that information in a function called emotional experiential memory – EEM for short.

At the most basic level, your EEM contains information like “Ice cream. Good. Repeat.” And “Touching hot stove. Bad. Avoid.” At higher levels, your EEM contains messages about the goals that move you, how you feel when you live your values and honor your relationships, and all the other things that ultimately define what your life will add up to. The more you engage with things that inspire you emotionally, the more powerful is your motivation to bring them into being. In the earlier stages, this means you'll be more committed to formulating breakthrough strategies when something grabs you emotionally; in the longer run EEM gives you extra energy for implementing your best open-space ideas (as I'll discuss in part two).<sup>21</sup>

So, notice when something you're doing, observing, or thinking about seems to carry an extra positive emotional charge for you. Write it down on a list you keep of ideas with oomph, and use some of your free time to think about what your future life could be like if you were working in open space on a breakthrough that really mattered to you.

As MIT psychologist Steven Pinker has written, “Without the stimulus and guidance of emotion, rational thought slows and disintegrates... The emotions are mechanisms that set the brain's highest-level goals.”<sup>22</sup>

Go with your gut. Scientists say that as much as 95 percent of thought, emotion, and learning occur somewhere beyond the conscious mind.<sup>23</sup> The intelligence of the thinking brain is useful, but good instincts can be even better. Yale professor Robert Sternberg has extensively studied the reasons why some people break through and most don't. He calls the differentiating characteristic “successful intelligence,” and he writes, “Between 75 and 96 percent of the variance in real world criteria such as job performance, innovation, and wealth creation cannot be accounted for by individual differences in intelligence test scores.”<sup>24</sup> Sometimes intellectually bright people can care so much about appearing intelligent that they withhold their curiosity, ingenuity and initiative at the very times when those qualities can count the most.<sup>25</sup>

Thomas Stanley, author of *The Millionaire's Mind*, calls the fallacy of waiting for superior intellect to make you successful “Big brains, no bucks.”<sup>26</sup> The vast majority of millionaires did not have the sharpest intellect or best grades in school, but they learned to use their ingenuity and every other kind of intelligence they could muster. And, it turns out, that is the far greater gift for any kind of success, not just financial, in life and work.

All of this is not about acting without thinking first; it's about augmenting your cerebral intellect with your other brains and bringing them at least a bit more fully under your conscious control to reap more of their benefits. You have to use your gut brain to grow its power and accuracy. As with my other suggestions, you can do this in small ways that add up to big differences in your brain. For example, think ahead now to an upcoming

challenge or interaction that is significant to you. Maybe it's a meeting with an important employee, customer, or other stakeholder. Think about it for a few moments. Often the brain in the head runs outcome probability percentages. It will scan the situation and assign a number for how ready you are: "You're 80 percent prepared for that meeting, and that's just fine," it might say.

Now hold the image of that key meeting in your mind and push the feeling down to your gut. What do you feel, if anything? Your gut will check out vast numbers of possible outcome scenarios in no time at all. And sometimes it will tense right up. Translation? Perhaps something like, "This meeting's more significant than others. If it goes really well, all kinds of doors will open. 80 percent readiness is not enough. Get more ingenious!" If you doubt the gut reading, look a bit more closely at the meeting and ask what defining moments might be hidden within it. Chances are, your other brain knows way more than you do. As I said earlier, none of us is smarter than the truth.

More generally, whenever an important question or challenge arises, pause for five seconds before you say anything, act, or touch the keyboard. Ask:

- What do my instincts say?
- What does my deeper experience say?
- Are there any gaps here?
- Any hidden breakthroughs?
- What's next? What's deeper? What's more?

Maybe it will take you more than five seconds to ask these questions at first, but after some practice – as your neural circuitry reshapes itself – they will begin literally to "ask themselves" without requiring you to deliberately invoke them..

Strategic breakthroughs can only arise from a brain that's able, and willing, to see them. The simple, science-based techniques I've listed here (along with others in *Get Out of Your Own Way*) can give you a critical edge for leading your organization out of closed space and into open space.

Robert K. Cooper is the author of *Get Out of Your Own Way: The 5 Keys to Surpassing Everyone's Expectations* (Crown Books: 2006). Called "the ultimate business guru for the new millennium" by *USA Today*, he is also author of the *New York Times* bestseller *The Other 90%* and other books that include *Executive EQ*. His website is [www.robertkcooper.com](http://www.robertkcooper.com).

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<sup>1</sup> *Get Out Of Your Own Way: The 5 Keys for Surpassing Everyone's Expectations* (New York: Crown Books, 2006)

<sup>2</sup> I call these "open-space breakthroughs" in honor of a handwritten note that had been passed down to my Grandfather Downing, written by his grandfather William Andrew Downing shortly before he left Dublin for America in 1800. "My life has become a closed world," the note read, "with little room left to hope or breathe. I can only struggle against endless limits, in long lines, longing for work, a morsel of food, some small advantage. It is madness. On the horizon is where hope lives. It is open spaces I dream of, across an unknown sea. I am going there."

- <sup>3</sup> I discuss the amygdala, and all the other brain parts covered in this essay, in *Get Out Of Your Own Way: The 5 Keys for Surpassing Everyone's Expectations* (New York: Crown Books, 2006).
- <sup>4</sup> Iacoboni, Marco. "Who Really Won The Super Bowl? The Story of An Instant-Science Experiment" at [http://edge.org/3rd\\_culture/iacoboni06/iacoboni06\\_index.html](http://edge.org/3rd_culture/iacoboni06/iacoboni06_index.html)
- <sup>5</sup> Diamond, M. *Enriching Heredity* (Free Press, 1988); Diamond, M. *Magic Trees of the Mind* (Plume, 1999).
- <sup>6</sup> Stewart, James B. "Partners" *New Yorker* (January 10, 2005): 57.
- <sup>7</sup> Ibid: 57.
- <sup>8</sup> Gershon, M.D., *The Second Brain* (New York: HarperCollins, 1999); Blakeslee, S. "Complex and Hidden Brain in Gut Makes Stomachaches and Butterflies," *New York Times* (Jan. 23, 1996).
- <sup>9</sup> For more about the heart-brain, see for example: Armour, J., and Ardell, J., eds., *Neurocardiology* (New York: Oxford University Press, 2004); Childre, D., and Martin, H. *The HeartMath Solution* (New York: HarperCollins, 1999); Institute of HeartMath: [www.heartmath.org](http://www.heartmath.org); See, for example: Armour, J., and Ardell, J., eds., *Neurocardiology* (New York: Oxford University Press, 1994); Childre, D., and Martin, H. *The HeartMath Solution* (New York: HarperCollins, 1999); Institute of HeartMath: [www.heartmath.org](http://www.heartmath.org); McCraty, R., Atkinson, M., and Tiller, W.A. "New Electrophysiological Correlates Associated with Intentional Heart Focus," in *Subtle Energies* 4(3)(1995): 251-268; See also: Lynch, J.J. *The Language of the Heart* (New York: Basic Books, 1985). For more on the brain in the intestines, see Gershon, M.D. *The Second Brain* (New York: HarperCollins, 1999).
- <sup>10</sup> "'Go With Your Gut' Science Finds New Evidence For Gut Instincts." *Enlightenment Magazine*: May-July 2004; see also Christopher D. Buckingham PhD MSc BSc & Ann Adams PhD MSc BA RGN. (2000) Classifying clinical decision making: a unifying approach. *Journal of Advanced Nursing* 32:4, 981-989.
- <sup>11</sup> Bargh, J., and Chartrand, T. "The Unbearable Automaticity of Being" *American Psychologist* 54(7)(1999): 462-479.
- <sup>12</sup> "Brain training" computer software, in fact, is the latest craze in several countries – coming soon to the U.S. See, e.g., Daniel Pink, "First Buns of Steel, Then Minds Like Steel Traps" at <http://finance.yahoo.com/columnist/article/trenddesk/2267> ("What aerobics was to the 1980s, brain fitness will be to the next decade.")
- <sup>13</sup> See, e.g., Sandra Blakeslee, "Cells that Read Minds" *New York Times* (January 10, 2006). <http://www.nytimes.com/2006/01/10/science/10mirr.html?ex=1145505600&en=6106ae957bcb7c81&ei=5070>
- <sup>14</sup> Holt, Jim. "The Way We Live Now." *New York Times Magazine* (May 8, 2005): 11 <http://www.nytimes.com/2005/05/08/magazine/08WWLN.html?pagewanted=all>
- <sup>15</sup> Begley, Sharon. "Scans of Monks' Brains Show Meditation Alters Structure, Functioning." *Wall Street Journal* (Nov. 5, 2004): B1
- <sup>16</sup> Gilbert, Daniel. "I'm OK, You're Biased" *New York Times* (April 6, 2006). <http://www.nytimes.com/2006/04/16/opinion/16gilbert.html?th=&emc=th&pagewanted=all>
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- <sup>19</sup> See, e.g., Freeman, W.J. *How Brains Make Up Their Mind* (Columbia University Press, 2000 and Storch, M. *Scientific American Mind* 16(2)(2005): 88-89.
- <sup>20</sup> Von Hippel, E., et al. *Creating Breakthroughs at 3M* (Harvard Business School Press, 2001); Nelson, B. *3M's Culture of Innovation* (Nelson, 2002); Gundling, E. *The 3M Way to Innovation* (Kodansha, 2000).
- <sup>21</sup> See, e.g., Damasio, A. *Descartes' Error* (Grossett/Putnam, 1995) and Thayer, R.E. *The Biopsychology of Mood and Arousal* (Oxford, 1989)
- <sup>22</sup> Pinker, S. *How the Mind Works* (Norton, 1987).
- <sup>23</sup> Wegner, D.W. *The Illusion of Conscious Will* (Cambridge, MA: MIT Press, 2002).
- <sup>24</sup> Sternberg, R.S. "Testing Common Sense." *American Psychologist* (Nov. 1995): 923.
- <sup>25</sup> Sternberg, R.S. (Ed.) *Why Smart People Can Be So Stupid* (Yale University Press, 2002): 32.
- <sup>26</sup> Stanley, T. *The Millionaire Mind* (Andrew McMeel, 2000).