



"This Is Your Brain ..."

A Decision-Making
Machine

Roy Wood ■ Patrick Barker

**"The brain is a
wonderful organ.
It starts working
when you get up
in the morning,
and doesn't stop
until you get to
the office."**

—Robert Frost

The lump of gray matter you call your brain has vast computing power that performs a plethora of vital tasks. It regulates your bodily functions, movements and emotions. It processes and makes sense of incoming sights, sounds, smells and touch sensations. The brain can store years of memories and allow you to perform complex tasks such as analysis, reasoning, goal setting and planning.

Yet, even with all these capabilities, the brain, paradoxically, has some rather stark limitations. It makes sense then that the more we understand about the capabilities and limitations of our brains, the better we are able to coax the maximum productivity from our internal computers. The goal is not necessarily to increase our brain's capacity, but gain more efficiency and effectiveness from the capacity we already have.

The Neocortex and the Limbic System

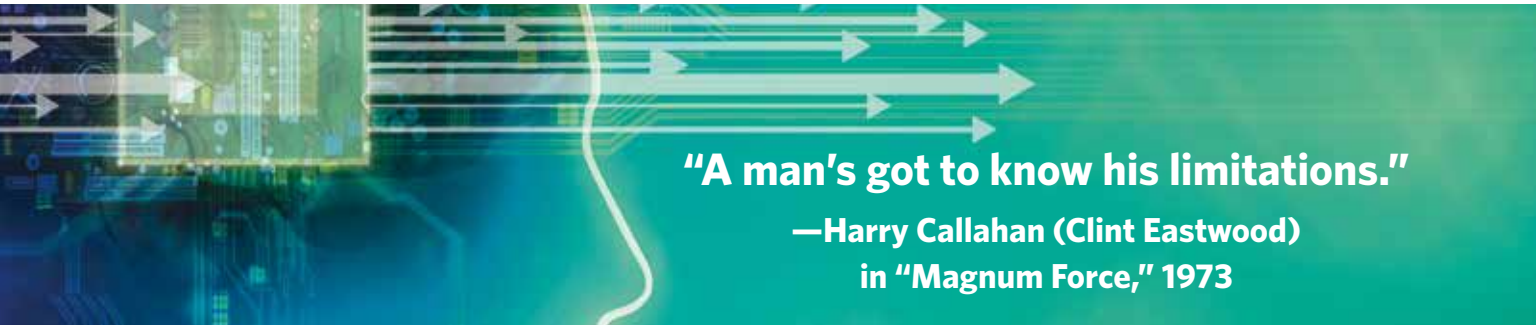
Without going too deeply into the science of the brain, we would point out two components: the neocortex, located atop the cerebrum's frontal lobes and which is the computational portion of the brain, and the limbic system beneath the cerebrum and associated with long-term memory and emotions. In our

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everyday work, these tightly connected, complementary systems help us manage, think and make decisions. The neocortex is where much of our conscious thought occurs. There short-term memories are stored and processed. The limbic system takes on our more primal challenges of deciding whether to fight or flee in the presence of perceived danger. Long-term memories and experiences also are stored here, often along with their emotional connections to pain or pleasure, past success or failure. The two portions of the brain also are quite different in their contributions to our conscious behaviors. The neocortex engages when we attempt

favorite decaf mocha soy cappuccino at the corner coffee shop without comparing prices, or evaluating the health benefits of soy over whole milk, emerge from the limbic system almost automatically. This may be especially true if your coffee's flavor is linked to a pleasant taste or memory of that time you and your significant other visited in Rome.

Likewise, some of your decisions at work may emerge surprisingly quickly. Your brain may recall memories and connections from a similar situation in the past. If that past decision got you into trouble, your emotional brain may deliver



"A man's got to know his limitations."

**—Harry Callahan (Clint Eastwood)
in "Magnum Force," 1973**

to do something new and challenging. The thinking portion of our brain tends to be slow, methodical and logical.

Consider, for example, when you were first learning to drive a car. You probably were overwhelmed with all the things you had to think about—operating the steering, accelerator, brake; keeping vigilant watch forward and in the rearview mirrors; planning your route, etc.

Our limbic system, on the other hand, prompts quicker and more automatic actions and sometimes more visceral "gut" reactions. One might expect this from the portion of our brain that evolved from caveman times to make fast life-or-death decisions. In modern human beings who are less likely to be lunch for some saber-toothed tiger, the limbic system has evolved into a storehouse for rules of thumb, or heuristics, that we rely on to make most of our routine decisions without really thinking about them.

Returning to the driving example, it is likely that after years of practice, you have had the experience of arriving at the office with few conscious memories of having done any of the mechanical process steps during your drive. You have moved thinking about driving the car from the conscious neocortex to the subconscious limbic system, making driving virtually a "no brainer."

Maximize Your Brain Power

Given this amazing organ and its two decision-making systems, how can we best leverage the way the brain works to optimize the things we have it work on?

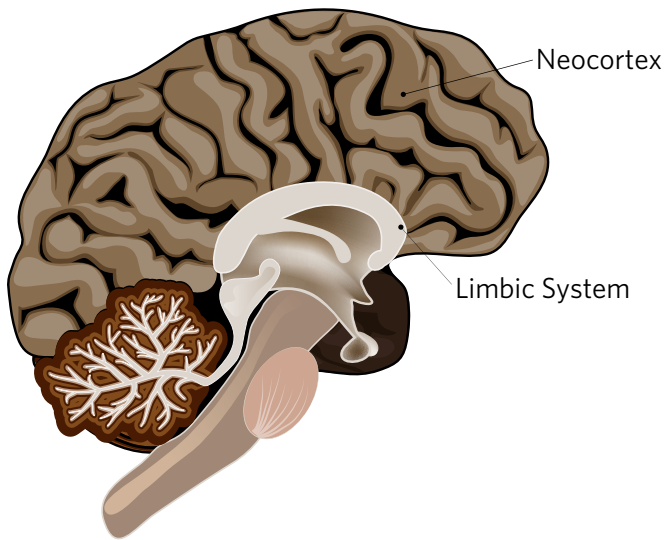
Know which system in your brain is making the decision. Most of our routine decisions, including habits like ordering your

a strong, fast recommendation that we recognize as a "gut reaction." If the situations truly are similar, then going with your gut is probably fine. However, if something is subtly different this time, it may be better to slow down your decision making and engage your neocortex to look at the facts and analyze the situation a bit more. It will require a conscious effort on your part to have your thinking brain overrule the limbic system, especially if a strong emotion is associated with the situation.

If we have to guard against our emotional brain taking over, why then do we not engage our neocortexes for every decision? The answer, as you might imagine, is that this strategy would slow your life to a crawl, require a lot of time and effort to make even simple decisions, and likely paralyze your decision making. Instead, you should save your computational brainpower for really hard problems, new tasks and important decisions. It generally isn't hard to know which problems require real concentration and thought, but recognize that those decisions will require more time and focus.

Manage Your Energy: The neocortex is not only slow but also an energy hog. It consumes a lot of glucose and oxygen to accomplish higher-order tasks like planning, assessing and decision making, so do what you can to address complex tasks only during your peak brain times. Are you a morning person or a night owl? Use these times and block your calendar for brain-draining tasks. Don't try to multitask. Turn off your email and avoid other distractions. Be aware that each task or decision reduces your energy reserve, so that subsequent efforts become even more challenging. For this reason, schedule 15- to 30-minute breaks between thinking sessions or decision meetings to allow your neocortex to rest and recover. Don't skip meals. Stay hydrated. It matters.

Figure 1. The Brain



Get Stuff Out of Your Head: Short-term memory is very limited, so find a way to capture things like to-do items, ideas, and other thoughts on paper, in your computer or smart phone. As simple as it sounds, writing down a comprehensive to-do list may be the most important step in clearing your brain of clutter so you can focus on more important matters. The book *Getting Things Done (GTD)* by David Allen can help you set up systems to do this and clear your brain for more useful tasks. As Allen says, "Your brain is for having ideas, not for holding them."

Practice Makes Perfect: Transitioning important information and process knowledge from short-term memory in the neocortex to long-term memory in the limbic system through practice and reinforcement helps the brain form time-saving heuristics (or rules of thumb) and builds subject-matter expertise. Malcolm Gladwell, noted author and researcher, claims that it takes 10,000 hours of deliberate practice to build expertise. Experts often can make insightful judgments and decisions without appearing to think too hard, since these insights come from a different part of the brain trained to sort out complex problems by recognizing patterns and relationships developed through years of experience. Consider how quickly an experienced program manager or contracting officer can spot anomalies and problems in a Statement of Work that would be beyond an intern's capability. Author Gary Klein calls this "seeing the invisible," and it is a skill reserved for those who invest the time and effort to become experts in their fields.


A Picture Is Worth a Thousand Words: Since long-term memories are stored in the emotional brain, linking information to emotions can aid in this transformation. Many memory experts suggest creating vivid (and sometimes outrageous) mental images linked to ordinary information in order to help remember them. This portion of our brain is particularly attuned to interpreting and remembering pictures and metaphors. Charts and graphs are quicker and easier to grasp

than spreadsheets. Diagrams and flowcharts can demystify complex processes. Mind maps are more brain-friendly than outlines. Similarly, word pictures and metaphors are powerful and memorable. Abraham Lincoln was a gifted speaker who frequently used metaphors. He once described the continuous flow of reinforcements requested by one of his Civil War generals as "shoveling flies across a barnyard." An entertaining introduction to memorizing information by using vivid images and other aids can be found in Joshua Foer's book, *Moonwalking With Einstein*.

Problem Solving Made Easy: The limbic system has hundreds of millions of nonlinear associations that are created and re-formed constantly. Sometimes, solutions to sticky problems seem to appear from nowhere in flashes of intuition. These "Aha!" moments can occur when the limbic system makes unexpected and subconscious neural associations. This very often happens during idle times when the neocortex is not focused on the problem at hand, allowing the limbic system room to work. Some experts suggest that we might be able to prompt these amazing insights by writing down a specific question about a problem or dilemma and then posing that question to the brain before going to sleep or when rising in the morning. The brain subconsciously looks for associations to answer the question without necessarily engaging the conscious brain. When least expected, and almost always when you're in the shower, exercising, or on a break, the brain delivers a brilliant flash of insight. If you're stuck on a problem, take a short walk and you may be rewarded with a productive thought. Oh, and keep a notebook handy to write it down.

Summary and Recommendations

You may not have 10,000 hours of experience with neuroscience, but you do have some experience and expertise operating your own brain. With these tips and some practice, you can have a reasonable shot at becoming an expert thinker and sound decision maker. Remember to maximize your brain power and decision-making capabilities by managing your energy levels and focusing your efforts. Avoid multitasking. Segregate the more difficult thinking and deciding tasks to times when you are at your peak, and fill the rest with less brain-stressing work. Clear your mind by writing down all your to-do items and miscellaneous notes rather than trying to remember them. Recognize that real experts make decisions from a different part of their brains that have been honed over time to make deep and varied connections through intentional practice, and get started building your own expertise.

Finally, give yourself some time and space and expect those "Aha!" moments when you take a break from thinking about your difficult challenges. Know your limitations and organize your work and life to maximize your brain's potential. You will be better thinkers and decision makers when you follow these steps. 

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