

# Brain Power

By Karl Albrecht

rain training, that curious category of human resource development that waxes and wanes over the years, seems ready to wax again. Pieces of it—such as creativity, innovation, and problem solving—come back into style periodically, and then fade out again whenever the next bottom-line fad comes along. Now, new findings from brain research—and from several established but less appreciated theories—offer some practical ways to think better. So, there's ample cause for a new wave of interest in training brains.

Can understanding your brain make you smarter? Knowing how your brain works can help you use it more deliberately for your benefit and success in life. Although most of us don't need to know the detailed inner workings of the brain or its anatomy, there are certain practical facts we can put to use and train others to use.

Let's test that premise with a practical example: Scientists have long known about "brain cycles," but few of us understand them or make good use of that knowledge, except perhaps intuitively or inadvertently. In the vocabulary of brain training, brain cycles are variations in the brain's focus of at-

People can be trained to use their brains more effectively for creativity, problem solving, and other thinking.

tention, ranging through a period of roughly 90 minutes. In one part of the cycle, your brain pays close attention to the outside world—the incoming data from the senses. During that phase, you’re consciously involved in interacting with your environment, such as when reading or listening attentively to what someone is saying.

At the other end of the brain cycle, your brain withdraws its attention from the sensory data stream and turns inward, processing its own stored images, sensations, reveries, thoughts, and musings. In everyday language, we say that your mind is “wandering.” That brain state is usually easily detectable in another person by watching his or her eye movement, facial expression, and diminished motor activity.

We can think of a number of immediate applications for just that one simple, but important, aspect of brain function. For example, you may observe that your boss seems to be distant and detached from a conversation, indicating that his or her brain has gone “offline.” You might decide to wait until another time to bring up a complex or critically important issue that requires full concentration—a time when his or her brain is back “online.” As another example, consider that there are times when you’re in the mood for work that requires close attention and concentration; at other times, you find it difficult to focus on details. To the extent that you can choose, you can tackle certain tasks when your brain cycle is in the right phase for doing such tasks.

We can apply findings like those directly to human performance management. Ask how many data-entry errors, short-changed customers, industrial accidents, surgical blunders, car crashes, and maybe even plane crashes are associated with brain cycles. Can we provide job aids and skill training to reduce those effects?

Another significant finding about brain function applies to motor skills such as sports. Accomplished athletes learn to trust their well-trained bodies and prevent their conscious minds from trying to take over at critical moments. Understanding how the brain learns to perform coordinated movements can help you play any sport more instinctively and naturally. The principle involved is based on the cooperation between the cerebral cortex and a lower part of the brain called the cerebellum. The cerebellum manages all motor activity that is “over-learned”—so well learned that it no longer needs conscious attention.

Walking, talking, speaking, and reciting familiar information are handled by the cerebellum, leaving the cerebrum free to manage more complex activities.

The cerebellum learns to handle coordinated motor activities by mimicking the electrical patterns that occur in the cerebral cortex as you learn to serve a tennis ball, play a guitar chord, or sing a song. Once you’ve learned the procedure thoroughly, the cerebral cortex delegates the task to the cerebellum, which usually handles it afterward. A problem arises when you become anxious about your performance, such as at a critical point in a tennis match or presentation. Under anxiety, the cerebral cortex tries to take over the activity, not trusting the cerebellum to carry it out expertly. Bad serves, golf hooks and slices, forgotten verses, and other flubs occur at the instant of conflict between the cerebrum and the cerebellum. Sports psychologist W. Timothy Gallwey explains that aspect of brain function well in his book, *The Inner Game of Tennis*, in which he prescribes mental techniques for preventing the higher brain processes from interfering with the well-learned and instinctive skills.

Although we don’t need to know as much as neuroscientists, maybe we should know at least as much about our brains as we know about our cars and computers. That simple brain knowledge can translate to increased personal effectiveness, higher career success, and greater contributions to our organizations. Let’s start with a better understanding of the architecture of mental process.

### The hierarchy of thinking: five minds

Recent brain research points ever more clearly towards the conclusion that we humans don’t have just one mind. We have multiple minds, which work together—or fail to—to enable us to cope with our surroundings. Harvard professor Howard Gardner’s theory of multiple intelligences supports that conclusion. The concepts of neurolinguistic programming, pioneered by Richard Bandler and John Grinder, contribute an important neurological perspective. The modular mind concept developed by Michael Gazzaniga and Robert Ornstein, out of the original split-brain research at Cal Tech, helps explain the impact of subconscious impulses on human behavior. Sigmund Freud’s fundamental concept of the subconscious mind and Carl Jung’s view of introversion versus extraversion also merit our understanding of the brain-mind system.

All of those bits and pieces of brain research are now coming together in the concept of what is being called, the modular brain. According to Ornstein's book *Multi-Mind*, the human brain is constructed with a large number of individual processing units or modules. Some of those modules, or collections of brain circuits, work at the automatic, biological level—as sort of the brain's operating system. Other modules come into and out of consciousness, handling various useful tasks from moment to moment. And others make up the conscious level of thinking: paying attention, reacting, interpreting, deciding, and launching various behavioral programs. A useful model of mental process needs to integrate and unify those various levels, and explain how they can work together to enable a person to deal effectively with his or her world. The most practical model for integrating the various modular processes seems to be a series of levels, a kind of hierarchy. Borrowing from Abraham Maslow's pyramid of needs, we can understand human mental process as a *hierarchy of thinking*.

*The automatic mind.* The biochemical and neurological processes of the body play just as important a part in our mental competence as the so-called conscious mental processes we think of as "the mind." All activity at higher levels depends intimately on physiological influences such as emotional arousal, mood, fatigue, stress, and the effects of foods, stimulants, and intoxicants. We all know that states such as fear, extreme anger, and even elation make it more difficult to think clearly and creatively. Conversely, we know that our conscious thought processes can trigger various states of arousal. Some researchers claim that such activities as meditation and visualization can accelerate healing, even in disorders as serious as cancer.

Clearly, the traditional distinction between body and mind makes little sense. All mental activity finds its expression, in some form or another, all the way down to the cellular level. Indeed, we may accurately say that we think with the whole body. The automatic mind serves as a kind of operating system for the entire mental process.

*The subconscious mind.* According to Freudian and Jungian theories, another level of mind, the subconscious mind, influences our conscious thoughts and emotional responses—just beyond the boundaries of our awareness. We probably understand the subconscious mind better than we realize. Although we can't dissect and study it, we can infer its operation by its ef-

fect on our behavior. By observing our own emotional responses, impulses, and reactions to experience, we can identify the recipes for emotional processes.

The subconscious mind houses the demons of our psychological makeup. Our fears, primitive impulses, addictions, greed, envy, jealousy, guilt, self-condemnation, and many other powerful emotions arise from these primal recipes. Certainly our altruistic impulses—generosity, compassion, and the desire to help others—arise from the subconscious mind. Our self-concept and self-esteem also stem largely from the subconscious mind.

*The practical mind.* When most of us refer to the "mind" or "conscious mind," we usually mean the regular thinking process that gets us through the day. That normal, habitual process depends heavily on learned routines of thought, or "brain scripts." We walk, talk, eat, read, write, sing, recite, decide, drive, buy, and perform countless other well-learned activities in a fairly mindless way. We've learned such brain scripts so well that we don't really think much about them. The practical mind, for better and worse, serves as our mental auto-pilot, enabling us to survive many life experiences while paying little direct attention to them. But the practical mind can cause problems when it activates obsolete, ineffective, or inappropriate brain scripts. The practical mind calls in various sub-routines, or service modules, from lower levels to deal with the moment-to-moment requirements of living.

*The creative mind.* At various times, we may break out of the auto-pilot mode of the practical mind and find ourselves thinking about new things and things in new ways. We all have moments of unusual mental clarity. We may experience a state of heightened awareness, accompanied by a sense of the significance of an idea. A flash of insight, a clever way to do something, a realization of some truth about ourselves—all signal the activation of the creative mind. We deploy its enormous potential for creating new solutions in our lives when we free ourselves from many of our automatic reactions, reeducate ourselves to speak in original ideas not slogans, suspend judgment, avoid arguments and ego battles, listen more attentively, and think in terms of options instead of one right way. Unfortunately, our cultural stereotypes of creativity have given most of us a warped conception of the creative person. Creativity means more than eccentric behavior and dressing offbeat, more than doing things differently for the sake of the difference.

Creativity involves *creating*—producing new, novel, and occasionally useful ideas. Most humans have a creative level of mind, although many don't realize it and haven't formed the habit of using it.

*The spiritual mind.* Most people crave meaning in their lives, and no society has ever existed (as far as we know) without some concept of the cosmos and humans' part in it. The spiritual mind is the part of us that seeks to connect to the "something else"—the source of inspiration, meaning, and higher purpose that transcends our daily experience.

Viktor Frankl, author of *Man's Search for Meaning*, believed that the need for a sense of meaning and significance forms the foundation of a person's mental health and, ultimately, his or her capacity to survive. We might consider the spiritual mind, in contemporary language, to be our wide-band connection to the cosmic Internet. Some practitioners place a person's spiritual experiences on a par with all other cognitive activities, even to the extent that spiritual experiences involve various skills. Presumably, someone can become spiritually intelligent as well as intelligent in the other dimensions of the mind.

### The power of the hierarchical model

The real power of the hierarchy of thinking is in its potential to integrate our understanding of the various levels of mental process, and to promote a sense of mental fluency in moving freely among the various levels of ordinary thinking. For example, if we conceive of intuition—not as some mysterious mental process outside the bounds of normal thought—but as a built-in component of the total mental process, we can value it in new ways and develop it just like any other mental skill. The same applies to creativity.

We can also understand the familiar distinction between left-brained and right-brained mental process in terms of the operation of the practical mind. Our conscious processing involves verbal-linear and non-verbal-nonlinear dimensions of knowing—beautifully integrated, by the way. Both dimensions are enriched by the processes of the subconscious and automatic minds—and, indeed, by all of the other minds. The concept of "thinking styles" comes directly into play—exemplified by such models such as my own, Mindex; the Herrmann model; and, to a lesser extent, the Myers-Briggs Type Indicator.

If we understand that the subconscious mind feeds information to the practical mind in constructive and

useful ways—and that valuing both ways of knowing can lead to superior thinking and mental health—we no longer have to regard the subconscious mind as the mysterious dark side of ourselves. It's a legitimate and respectable part of our mental process—no more, no less. If we understand that the automatic mind conditions—and is conditioned by—all other mental processes, we can deal more readily with stress, emotional experiences, and constructive states of awareness such as meditation, hypnosis, positive affirmation, and psychosomatic wellness.

Of course, whatever appeal this multilevel explanation of human competence may have, we should also recognize that it can never explain all of the human mental process. We don't know where the various minds reside in the brain, or whether they even exist. Any attempt to talk about them as separate entities runs the risk of obscuring their interdependence. It makes more sense to think of them as dimensions of a total brain-mind system rather than as separable functions.

In particular, we need to broaden our definitions of certain terms we typically use to describe various aspects of thinking. Because we've agreed to describe thinking as a bodily function—one involving all levels from the cortical synapses to the cells throughout the body—it makes sense to broaden the terms *think*, *thought*, and *thinking* to mean the total creative experience of processing information. We also need to broaden the definition of the word *brain* to refer to the total brain-mind system. And we need to abandon, as much as possible, such arbitrary dualities as *body and mind* and *thinking and feeling*. One thinks with his or her whole body, not just with something called the mind. People can't think without also feeling and can't feel without also thinking. They aren't separate functions, but aspects of the whole.

### Brain training

The main reason that brain training hasn't advanced very far is that we haven't tried very hard to advance it. Few organizational training programs have approached the teaching of mental process as a comprehensive set of skills. And the public schools? *Fuhgeddaboutit*. Consequently, our unspoken model of mental process is basically a collection of random skills the average person picks up accidentally as he or she navigates the experiences of life from adolescence to adulthood. Some people pick up more smarts than others do.

Many training programs do little more than flirt with the idea of cognitive-skill training. So-called soft skills such as creativity and innovation come across more as entertainment or change-of-pace topics that offer a break from serious fare. Few programs teach such methods as idea mapping, card writing, and system diagramming, which can be powerful tools for individual and team problem solving. Quality programs sometimes provide skill training in the use of information tools, but seldom as cognitive skills in their own right.

Go to a typical conference and you might sign up for a workshop called “Developing Your Intuition”—usually taught by a self-important narcissist who implies that you’re just too uptight to “let it flow” and that he or she is more emotionally and spiritually emancipated than you are. Creativity is often represented as a higher form of character—not to be defined or evaluated, but experienced. That kind of fuzzy thinking about thinking has given the teaching of thinking a bad rap.

If we’re going to approach brain training with the same discipline we apply to other forms of competence building, we should start with a reasonably clear competence model. What are the skills we need to teach? Actually, the question isn’t as daunting as it sounds.

There are many different aspects of the thinking process that we can treat as skills, and they seem to deal with many different dimensions of cognition. We can make sense of them by starting at the macro level. What are the macro skills that make up a reasonably comprehensive approach to mental process, and how do they make sense within the framework of the hierarchy of thinking? I nominate these 10 macro skills, which I’ve used as a working model of *practical intelligence* for the past 20 years:

- mental flexibility
- openness to new information
- capacity for

systematic thought

- capacity for abstract thought
- ability to generate ideas
- sense of humor
- positive thinking
- intellectual courage
- resistance to enculturation
- emotional resilience.

As an exercise in training design, take any of those 10 macro skills and think about the many ways you could operationalize it in a training activity. First, you need to define it more clearly for participants. Then, you can help them grasp examples of it in action and

provide them with experiences and opportunities to put it to use. Each of the macro skills lends itself to self-assessment and introspection:

- How well-developed is my sense of humor?
- How well do I maintain a positive frame of mind and encourage others to do the same?
- How open am I to new information and new experiences?
- How well do I manage

the building blocks of abstract or conceptual thought?

Approaching the brain-training mission armed with an integrated model of mental process, such as the hierarchy of thinking, enables us to bring together diverse practices under the single umbrella of practical intelligence. For example, we can train people to combine divergent and convergent thinking processes for effective problem solving, using such tools as idea mapping, slip writing, affinity diagramming, and brainstorming.

We have training methods that can stimulate the use of intuition as a built-in component of practical problem solving. They include meditative listening, word association, and free-form drawing to get beyond the mental blocks that arise in dealing with complex problems. We can also train people to use logical, procedural thinking techniques such as flowcharts, system diagrams, and logical templates, including grid

## The Hierarchy of Thinking: Five Minds

Spiritual Mind

Creative Mind

Practical Mind

Subconscious Mind

Automatic Mind

charts, truth trees, and schematics.

Emotional intelligence falls naturally within the concept of the hierarchy of thinking. If we learn how to overcome the arbitrary language of duality that portrays feeling as something separate from thinking, we can see that mental health and mental competence incorporate all five minds working in harmony. Brain training offers a natural way to teach people to use language more effectively. The principles and methods of General Semantics, for example, can enable people to express ideas more clearly, communicate more humanely, avoid misunderstandings and conflicts, and become less susceptible to manipulation and coercion by others. And we can certainly train people to apply the principles of clear thinking in team situations, to capitalize on the total brain power available. The use of thinking styles in particular—such as left-brain versus right-brain or concrete versus abstract—can play a powerful role in creating mental synergy in team situations.

What about organizations? Can brain training contribute to making enterprises as a whole more intelligent? Organizational intelligence is really brain power writ large: the capacity of an organization to mobilize all of its available brain power and focus it on achieving the mission. But before more organizations are going to invest in brain training, they're going to need to see more well-formed, state-of-the-art training methods. The American Management Association recently made a commitment to that cause, particularly with its "Brain Power Course," a three-day public seminar on the development of thinking skills useful to businesspeople in their careers.

"We've long recognized the value of training professional people in advanced cognitive skills," says AMA senior vice president Diane Laurenzo. "Those skills include divergent and convergent thinking, brainstorming, creative idea production, information mapping, group dynamics, team problem solving, understanding thinking styles, listening and explaining ideas, and even building self-concept and self-esteem. Those are foundation skills every person can use every day in his or her job, career, and personal life."

The training profession needs to move beyond the gee-whiz stage—fluffy little sessions and games that treat creativity and intuition as forms of recreation. We're long overdue to apply the same discipline and design skills to mental competence that we apply elsewhere. With the unrelenting pace of the transition of

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modern organizations from thing-cultures to think-cultures, the need for people who can think clearly will only increase. With the utter failure of most of our public schools to equip our young citizens with effective thinking skills, our business organizations are becoming the educators of last resort. I believe enterprises will discover unequivocally that training employees in the process of thinking can bring the highest returns on the resources invested.

Can the training community rise to this challenge—and opportunity? TD

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