

How to Develop the 3 Components
of Intelligence That Matter Most
in Today's World

BASED
ON PIAGET'S
THEORY OF
HOW MINDS
DEVELOP

Mind Magic

JOHN LAURENCE MILLER, Ph.D.

FOREWORD BY

Seymour Papert, Ph.D., Professor, MIT, and
National Book Award Winner for *Mindstorms*

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FOREWORD

I like this book because I can disagree with half its statements and yet feel at one with an author who virtually tells me not to accept what he says. By disagreeing I am agreeing with what I take to be the book's key passage: "There are many people only too willing to teach you what they consider to be 'the right way to use your mind.' The right way for them, however, may not be the right way for you. You may be far better off if you develop your own 'right way.'" Here I have only a slight disagreement: he should not have said *may be*.

The real point of *Mind Magic* is its provocation to do what, when I was younger and thought the world was simpler, I would have called "thinking about thinking." But that is too narrow. True, the provocation of the book is to stop being timid about applying your mind to your mind. But mind is more than thinking. It involves feelings as well as thinking, unconscious happening as well as conscious application, and intuition as well as logic. It is an amazing but true fact that we do not have a name for any such inclusive mind process. Our language is built firmly on the neat divisions. We think thoughts, we feel emotions; thoughts are right or wrong, feelings are good or bad. There is a serious shortage of words to talk about the more complex views of mind that, as Laurie Miller forcefully tells his readers, that have come in the wake of more complex lives.

So what can we do about it? One way is to get pompous and invent new fancy words and "unified" theories that will somehow combine all the disparate elements. I prefer Miller's way: stick with the ordinary

unpompous ideas that are the fabric of real minds, throw them all together with homely stories and multiple interpretations of multiple theories into the witch's brew and let magic—your personal mind magic—do its tricks. If he wants support from on high I offer him two. A great scientist, Marvin Minsky, is fond of saying that understanding means understanding in many separate ways—not bringing them together. Poet Robert Graves writes, “Refuse to choose / When life seems to give / Love in alternative.” In any case don't let anyone, even Miller (not that he is trying) tell you which is the right way to be you. Or even that there is just one.

Seymour Papert

ACKNOWLEDGMENTS

It is strange how small decisions can change your life. After my second year of college, a friend and I decided to take a year off school and travel to Europe. The year turned out to be wonderful but left me bored when I had to come home for my third year of college. One day, after walking out of a psychology lecture, I decided, on impulse, to write to Jean Piaget to ask if I could work with him. At the time, I was at least as interested in going back to Europe as in studying psychology. And I could not imagine that Piaget would even reply. But to my surprise, he did write back and said that I could go to Geneva on the condition that I could pass the university's French competency examination. The next September, I was in Switzerland.

The two years I spent in Geneva shaped the work that I have done ever since. It was a great opportunity to work and study with a number of first-rate thinkers. Foremost among them were Guy Cellérier (a brilliant man whose ideas have never been fully appreciated outside of Switzerland), Bärbel Inhelder, and Piaget himself. While in Geneva, I met the South African mathematician and educational theorist Seymour Papert. After I went to Harvard to do my Ph.D., Papert served as my mentor and thesis adviser. As it turned out, the time that I spent at Harvard corresponded with one of the most productive and exciting periods in twentieth-century psychology. The new field of cognitive science was taking root, and Papert and Marvin Minsky together were developing its most innovative ideas. I see Minsky and Papert as the original

mind magicians. Without their seminal ideas, this book could never have been written.

The key concepts in this book grew out of theoretical and applied research as well as discussions with friends and colleagues and my attempts to solve practical problems in clinical, educational, and business settings. I especially thank Mary Louise Bat Hayim, who worked with me for ten years while we developed the Learning Therapy Program at York University in Toronto. Her ideas were particularly influential in the discussion of learning disabilities in Chapter 7. Other colleagues whose ideas and encouragement have been especially important to me include Richard Chase, Shalom Fisch, Annette Karmiloff-Smith, Thalia Klein, David Leiser, Anne Lopes, Ruth Lugo, Harold Minden, Corey Schwartz, and Marc Wilchesky.

To produce a book for a nonprofessional audience required that I become something of a writer in addition to being a psychologist. Early drafts of this book were written in a style that would interest few people other than professional academics. I am deeply indebted to my wife, Joelle Silverman-Miller, above all others, for the weeks and months she spent painstakingly reading and critiquing my book, chapter by chapter and line by line. During this time she guided me in re-creating my ideas in a form accessible to an educated but nonprofessional readership.

I would like to thank the following people as well for reading and offering helpful criticism of sections of this book: Ling Lukas, Sigle Magner-Skeries, Myriam Orozco, Elizabeth Saenger, and Nicholas Smith.

Finally, I owe a large debt to my agent, Jay Johnson. His editorial advice and business judgment, not to mention his skill in quickly finding the right publisher, have been consistently on target. I also deeply appreciate the help that I received from Judith McCarthy, my editor at McGraw-Hill. Throughout the process her editing and judgment were consistently sound. Her comments forced me to rethink many issues related to mind magic, in each case strengthening the analysis and presentation. I would also like to thank her assistant Mandy Huber, who has been a pleasure to work with.

INTRODUCTION

HOW TO GET AHEAD IN THE INFORMATION AGE

Alice laughed. "There's no use trying," she said. "One can't believe impossible things."

*"I daresay you haven't had much practice," said the Queen.
"When I was your age, I always did it for half-an-hour a day.
Why, sometimes I've believed as many as six impossible things
before breakfast."*

—LEWIS CARROLL

Mind Magic offers a new way of thinking about your mind. It will provide a fresh perspective on the whole question of what intelligence is, along with practical suggestions of ways to increase and improve your mind's power. It will help you to cope with the complex and ever-increasing demands of life and to thrive and prosper in the changing world we live in.

The notion of mind magic may seem impossible. But it is entirely realistic. In fact, constant change in society and in the economy is making it more and more imperative to learn the tricks of mind magic. Like everyone else, you will soon need to learn in better and more powerful ways. If you do not, the growth of knowledge and advances in technology will make much of what you presently know obsolete. If you do, you not only will comfortably adapt to the future, but you will also participate in inventing it.

The Challenge of a New Era

Since the late 1970s, we have been living through a watershed in human history—the computer revolution. There is no going back to the way things were. Both our society and the economy are notably different from the way they used to be. The computer revolution has been changing the way we work and the way we form and conduct personal relationships. Indeed, it has been changing the way we live.

But what aspect of our lives is it changing the most? It has arguably had the deepest and most sustained effects on the way in which we use and understand our own minds. If you look at the profession of psychology, you'll see that the influence of computers and computer science is unmistakable. Consider, as an example, MIT psychologist Steven Pinker's 1997 book titled *How the Mind Works*, which draws largely on research based on computer models. Can understanding how your mind works help you to use it more effectively? As you will see, the answer unambiguously is "yes."

The computer age is different from the era that came before, but not just in the kinds of machinery or even the kinds of ideas that we use. As futurologist Alvin Toffler has repeatedly pointed out, we live in a world where change is faster, deeper, and more ubiquitous than ever before. The development of computer technology has contributed substantially to an increasingly rapid pace of change. Coincidentally, it is also the source of ideas that will help us adapt to and thrive in the world of perpetual change that it has helped produce.

Where do we see change happening? Look at the world of education. Think back a few decades. As recently as the 1960s and '70s, most middle-class parents believed that children who did well in school would grow up assured of a decent-paying and personally rewarding job. Today that kind of confidence seems more like complacency. What went wrong? Most people just do not trust the system that much anymore. In the 1960s most parents felt they could count on education as being a safe and certain road to their children's economic success. In 2005, parents no longer view their children's formal schooling to be any guarantee of future success.

Today preparing for the future means preparing for constant change. After all, what good is a head crammed full of facts if those facts will become obsolete in a few short years? At a time of change, less is more. Won't the people who can keep up with the speed of progress be the ones who will get ahead? Teaching children to adapt will prove far more useful than teaching them any concrete set of facts. Put simply, we should teach them mind magic.

Indispensable Qualities in a Changing World

The importance of learning adaptability is not limited to children in school. It pertains to you, too. Adapting to change is a crucial skill regardless of whether you are a CEO or you are just starting out.

The rapid pace of change is both good news and bad. It is good news for people who are ambitious and flexible. It means that the next technological revolution is probably just around the corner. And when it comes, it will inevitably create new and previously unforeseeable work and business opportunities. The bad news is for people who find change difficult. A rapid pace of change will make certain skills and related occupations obsolete.

If you can anticipate the next revolution from the beginning, you will have an enormous advantage in learning to use and profit from new inventions and discoveries. Furthermore, becoming a participant will give you a head start over people who watch from the bleachers. Conversely, if you cannot adapt to change, you will become its victim.

Is adaptability in itself enough? Here is another question: how well do you manage information? New information, if anything, is an even more potent force than new technology. And the speed at which new information appears and proliferates is at least the same as the speed of technological progress.

New information technology, such as the Internet, serves to speed up the dissemination of facts and data. Keeping up with the growth and spread of information has become just as important for you as becoming familiar with new technology.

Many managers have already begun to feel pressured to assimilate and evaluate larger quantities of information than they feel they can handle. This feeling has led a growing number of office workers to complain about what psychologist David Lewis calls *data smog*. How will you cope when confronted with a confusing mass of data? You will need to be able to dive in, pick out a few critical facts or concepts, and use them as hooks to hang a coherent picture of what the information as a whole is telling you. Having this ability will protect you from feeling overwhelmed by new data as they become available.

You will have to consider a third skill, namely the talent for creativity, or innovation. Like the other two attributes, creativity will also become essential for finding and keeping a good job. Why is creativity more important today than it was in the past? The answer again is the computer. In the past you could earn your living by diligently applying what someone had taught you in school. But the days will soon be over when a company will pay you to apply tried-and-true methods. Today companies can buy a robot to do that.

In the future companies will hire human beings to succeed in those areas where computers fail. Applying set procedures, mechanically and repetitively, has become the work of computers, not people. Companies have learned this. More than ever before, you will have to value and nurture your talent for innovation.

Developing creativity will be essential for you to define and shape your own economic niche, where technological progress is not likely to become a threat. It is a truism: computers cannot innovate, but you can. Even if you do not consider yourself to be especially creative, the fact remains that you are surely more creative than present-day computer programs. You need to recognize creativity as one of your true strengths, even if you have not viewed it as a strength in the past. Nurture your creativity, and it will reward you.

To recap, there are three indispensable skills that together will help you cope with unprecedented demands on your abilities. First, you must be able to easily and quickly adapt to change; second, you must become an adept manager of information; and third, you must develop creativity and innovation. This book will offer you practical information that will help you to master mind magic and prepare for success.

Adapting to Change by Expanding the Mind

How will you adapt to this new social reality? Many routes are open to you, from buying a more powerful computer to studying economics. For most people, one clear starting place is to concentrate on your own mind and to develop the capacities that new circumstances will reward. In other words, develop and expand your own intelligence.

Is it actually possible to increase your own intelligence? Many people still see intelligence as a fixed resource measured by IQ tests. Interestingly, psychologists have increasingly come to reject this view. In 1995 psychologist David Perkins, a professor at the Harvard Graduate School of Education, published *Outsmarting IQ: The Emerging Science of Learnable Intelligence*. In this book, Perkins spoke for a growing number of psychologists who reject the notion that intelligence cannot change.

What has caused this revolution in thinking among psychologists? Perkins and other psychologists came to realize that intellectual abilities are in essence no different from other kinds of know-how. Acquiring the knowledge that IQ tests measure is essentially no different from developing any other ability, such as drawing or swimming.

Virtually everybody can draw, at least to some extent, except for people who suffer from a severe handicap. Give children crayons or pencils and they will draw. Even crippled or disturbed children usually enjoy drawing. Nevertheless, except for a gifted minority, most people do not draw especially well. They can learn to draw well, of course, but only by study and practice. They can improve their skill even further by reading books or taking courses that present advanced drawing techniques and art theory. Drawing is a learnable skill. The proof lies in the number of people who have learned to draw.

Swimming is another learnable skill. If you want to swim well, you need considerable practice and almost certainly at least some instruction.

Now here is the crucial question: aren't intelligence and thinking just as learnable as drawing and swimming? Like drawing and swimming, exercising your mind is something that you do naturally. Nevertheless, without practice, your skill as a thinker can remain rudimentary. How

can you strengthen your mind? The purpose of this book is to offer methods, tools, and information that can help you to use your mind more successfully. What your mind can achieve is indeed amazing. That is why I call this ability *mind magic*.

Adaptability or Power: Which Matters More?

Most people in the past have conceived of intelligence as being equivalent to what you may call *mental power*. To replace the centrality of the concept of power with that of adaptation represents a fundamental shift in how you see the mind.

Until recently almost everyone in our society, professional psychologists and the general public alike, considered you to be very intelligent if you had a powerful mind, regardless of whether or not you were particularly adaptable. A smart person was someone who could use his or her mind to do something that seemed difficult and complicated. You could appear intelligent if you were skillful at games that seem to require mental power, such as chess, or if you could intimidate people with your talent at winning arguments. On the other hand, if you were adaptable, most people would probably never have noticed.

One of the main problems with a power-oriented view of intelligence was that power intelligence often proved rigid and inflexible. It is the dinosaur of the intelligence world. And like the dinosaur in prehistoric times, people with power intelligence did indeed reign supreme, as long as conditions in the outside world were essentially stable. But when change replaced stability as the norm, these people quickly became lost. They were no longer in their element. And their old way of looking at the world, which they had built up over many, many years, was suddenly obsolete.

A second problem was that power intelligence often did not turn out to be useful, regardless of how much it could impress. Being good at winning arguments or chess matches can certainly impress people. But it does not necessarily help in earning a living. The world is full of people who can impress us with how much they know, but all their knowl-

edge does not necessarily do them a lot of good in the real world. Think of all the people with Ph.D.s who end up earning a living as taxi drivers!

In times of rapid change, you will often do better to have a simpler, more schematic view of reality, one that captures the essence of things even if it misses some of the details. For starters, changing your mind becomes easier. It costs less in time and energy because you do not have to reexamine as many beliefs or reevaluate as many commitments. In a word, it makes you more adaptable.

In the future, adaptability is likely to prove more important than power. You will do better to have a simpler, sleeker, and more elegant mind that can reinterpret and revise what you already know in response to new information. People who immerse themselves in complexity might find themselves so weighed down by details that they feel unable to respond.

Free Your Imagination

Especially to people who see themselves as hard-headed realists, telling you to free your imagination seems like the worst possible advice. Perhaps you know people who feel that way. Self-styled realists often equate imagination with wishful thinking, and they see imagination as a way of avoiding reality, its unpleasant side in particular. For them, exercising their imagination is fundamentally opposed to facing reality.

But too much pessimism can be just as dangerous as too much wishful thinking, and perhaps even more so. The Danish storyteller Hans Christian Andersen describes its effects in his fairy tale “The Snow Queen.”

As the story begins, the most wicked of all the gnomes, the Evil One himself, has devised a terrible invention. He has invented a looking glass with the peculiarity that anything good or fair disappears into nothing when reflected in the mirror, while anything bad or foul becomes much worse. In this mirror, the loveliest landscapes look like cooked spinach, and the most attractive people become ugly and stand on their heads. Anyone who has a freckle can be sure that it now cov-

ers his or her nose and mouth. Faces become so distorted that no one can recognize them.

You might expect that the people would keep away from such a wicked invention, but just the opposite happens. People go to the Gnome School, run by the Evil One, and proclaim far and wide that a miracle has happened. They hold up the distorting mirror so that everyone can see it. “Now at last,” they say, “you can see how the world and mankind really look.”

What they saw had no more to do with reality than would the contents of a mirror that reflected only what was beautiful and pleasant. But they had become so cynical and pessimistic that they could no longer recognize this. Pessimists who see nothing but bad are just as deluded as optimists who see nothing but good.

The people in “The Snow Queen” in effect suffered from a mild—or perhaps not so mild—form of depression. They had become so demoralized that they could no longer distinguish between being realistic and being pessimistic. There are a number of possible explanations for why this may have happened. Perhaps they genuinely had experienced such unhappy lives that they had no choice except to believe the worst. Perhaps they were poor at problem solving and became discouraged when they could not cope. Perhaps they were unduly influenced by pessimism in the surrounding culture. But whatever the reason, the effect was to undermine and cloud their judgment.

To believe that things can never become better is self-destructive. Too much pessimism saps morale and paralyzes the mind. It can make you feel so convinced things have to be bad that you unconsciously make them turn out that way. The optimistic belief that things can be better is the spark that ignites imagination. Imagination in turn enables creative innovation and adaptive change.

The Right Kind of Intelligence for the Times

The example of power intelligence illustrates the fact that the meaning of intelligence will be different depending on social and environmental context. What is intelligent at one time or in one social context may

become unintelligent later. Power intelligence may have worked well in the world of black-and-white television and vinyl records, even if it has now become out of date in the world of artificial intelligence and the Internet.

The Australian actor and director Paul Hogan vividly made this point in the 1986 movie *Crocodile Dundee*. Dundee is a bona fide genius in the art of surviving the Australian outback. He combines the inventiveness of a master at improvisation with a profound sense of empathy for the land, the wildlife, and native Aborigine society. But when he moves to New York City, he is a fish out of water. The inventiveness and practicality that served him well in Australia prove useless in dealing with high society, modern technology, and the avant-garde. The genius of the outback has become the imbecile of Manhattan.

A person as naturally intelligent and adaptable as Crocodile Dundee could and did, of course, eventually learn the ropes of surviving even in Manhattan. But that is not the point. Even in adapting to Manhattan, he was no longer living in his native element. It is unlikely that he would ever handle himself with the brilliance and mastery that made up his daily existence in the outback.

To understand mind magic, you have to do more than measure what people know and examine how they reason. You also have to look at the world around them. And as that world changes, the meaning of mind magic must change as well.

How will it change? This book presents an introduction to and overview of mind magic as it exists today. You are invited to learn more about mind magic and to participate in its evolution by visiting the mind magic website, **power-your-mind.com**.

[All names throughout this book have been changed for privacy except for those of published authors and other public figures.]

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