

EVANSTON, Ill. --- At an 11 a.m. press briefing, Saturday, Feb. 20, at the American Association for the Advancement of Science annual meeting, a Northwestern University neuroscientist will argue that music training has profound effects that shape the sensory system and should be a mainstay of K-12 education.

"Playing an instrument may help youngsters better process speech in noisy classrooms and more accurately interpret the nuances of language that are conveyed by subtle changes in the human voice," says Nina Kraus, Hugh Knowles Professor of Neurobiology, Physiology and Communication Sciences at Northwestern University.

"Cash-strapped school districts are making a mistake when they cut music from the K-12 curriculum," says Kraus, director of the Auditory Neuroscience Laboratory in Northwestern's School of Communication.

Kraus will present her own research and the research of other neuroscientists suggesting music education can be an effective strategy in helping typically developing children as well as children with developmental dyslexia or autism more accurately encode speech.

"People's hearing systems are fine-tuned by the experiences they've had with sound throughout their lives," says Kraus. "Music training is not only beneficial for processing music stimuli. We've found that years of music training may also improve how sounds are processed for language and emotion."

Researchers in the Kraus lab provided the first concrete evidence that playing a musical instrument significantly enhances the brainstem's sensitivity to speech sounds. The findings are consistent with other studies they have conducted revealing that anomalies in brainstem sound encoding in some learning disabled children can be improved with auditory training.

The Kraus lab has a unique approach for demonstrating how the nervous system responds to the acoustic properties of speech and music sounds with sub-millisecond precision.

The fidelity with which they can access the transformation of the sound waves into brain waves in individual people is a powerful new development.

The neural enhancements seen in individuals with musical training is not just an amplifying or volume knob effect," says Kraus. "Individuals with music training show a selective fine-tuning of relevant aspects of auditory signals."

By comparing brain responses to predictable versus variable sound sequences, Kraus and her colleagues found that an effective or well-tuned sensory system takes advantage of stimulus regularities, such as the sound patterns that distinguish a teacher's voice from competing sounds in a noisy classroom.

They previously found that the ability of the nervous system to utilize acoustic patterns correlates with reading ability and the ability to hear speech in noise. Now they have discovered that the effectiveness of the nervous system to utilize sound patterns is linked to musical ability.

"Playing music engages the ability to extract relevant patterns, such as the sound of one's own instrument, harmonies and rhythms, from the 'soundscape,'" Kraus says. "Not surprisingly, musicians' nervous systems are more effective at utilizing the patterns in music and speech alike."

Studies in Kraus' laboratory indicate that music -- a high-order cognitive process -- affects automatic processing that occurs early in the processing stream. "The brainstem,

an evolutionarily ancient part of the brain, is modified by our experience with sound," says Kraus. "Now we know that music can fundamentally shape our subcortical sensory circuitry in ways that may enhance everyday tasks, including reading and listening in noise."

At 3:30 p.m., Saturday, Feb. 20, Kraus will present "Cognitive-Sensory Interaction in the Neural Encoding of Music and Speech" as part of a panel on music-language interactions in the brain at the annual meeting of the American Association for the Advancement of Science.

For more about the research of Northwestern University's Auditory Neuroscience Laboratory, visit the laboratory's Web site at

HYPERLINK "<http://www.brainvolts.northwestern.edu/>"

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Insights Gained Into Arts and Smarts

By Debra Viadero

Findings released this week from three years of studies by neuroscientists and psychologists at seven universities help amplify scientists' understanding of how training in the arts might contribute to improving the general thinking skills of children and adults.

"We tend to think of the artist, on the one hand, and scientists and mathematicians, on the other, as fundamentally different people," said Elizabeth S. Spelke, one of the scholars who took part in the research project. "I think the work done here suggests a much closer connection between the cognitive processes that give rise to the arts and the cognitive processes that give rise to the sciences."

The idea that the arts, and music in particular, could make children smarter in other ways gained currency in the 1990s, after a pair of researchers published a study showing that college students performed better on some mathematical tests after listening to a 10-minute Mozart sonata.

The news led to some widely reported, if fleeting, efforts to promote music learning. Georgia legislators, in fact, even voted to provide parents of newborns with tapes of classical music.

But most neuroscientists viewed such policy moves as premature: The studies never definitively determined whether exposure to music, or other arts, causes changes in the brain that sharpen other kinds of thinking skills. Left unsettled, experts say, is whether the arts make people smarter or whether smart people simply gravitate to the arts.

Burying Myths

In an effort to get at that question in a more comprehensive, systematic way, the Dana Foundation of New York City in 2004 brought together neuroscientists and cognitive psychologists from seven universities to launch a broad program of studies looking at how experience in dance, music, theater, and visual arts might spill over into other areas of learning, and to explore possible mechanisms for those links in the anatomy of the brain— even at the genetic level.

The final report from that \$2.1 million effort was unveiled at a March 3 conference at the center's Washington headquarters.

While the report still doesn't provide any definitive answers to the arts-makes-you-smarter question, it sounds a final death knell to the myth that students are either right- or left-brained learners, say the scientists involved in the study. It also offers hints on how arts learning might conceivably spill over into other academic domains.

The research team at Stanford University, for instance, studied the development of reading fluency in 49 children between ages 7 and 12. They found that the students who came to the study with more musical training tended to make faster gains in reading fluency than did students with no musical backgrounds.

The researchers also used brain scans and newly developed software technology to study the corpus callosum, the part of the brain linking the left and right hemispheres, as the children grew. They found that the “white matter” pathways responsible for phonological awareness—the ability to pull apart and manipulate the sounds in speech—grew to be more highly developed in the children who were stronger readers than in those with weaker reading skills.

“We think these things all go together,” said Brian Wandell, who led the Stanford study. “Listening carefully to other sounds has long been thought to be important to the development of phonological awareness and reading fluency.”

But until now, few or no longitudinal studies backed up that connection, Mr. Wandell added.

In a finding that surprised them, the Stanford researchers also found preliminary evidence suggesting a link between visual-arts lessons outside of school and children’s skill at math calculations, possibly because both activities involve recognizing patterns.

Paying Attention

In her study, Ms. Spelke, a psychology professor at Harvard University who usually studies the basic understandings that babies bring into the world, attempts to peel back the layers on the “Mozart effect” with three experiments involving children and adults.

She found that middle and high school students who studied music intensively, typically because they were enrolled in special schools for the arts, were better than students with little or no musical training at tasks involving basic geometric skills, but not at tasks involving other kinds of fundamental mathematical systems, such as basic number representation.

Other studies in the mix also suggest a link between music training and skill at manipulating information in both longterm and working memory; between music learning and speaking fluency in second-language learning; and dance and the ability to learn by observing movement.

Training in acting, the study also found, also appears to lead to memory improvement. One way that arts learning might lead to improved thinking skills, hypothesized Michael Posner, a professor emeritus at the University of Oregon in Eugene and an adjunct psychology professor at Cornell University in Ithaca, N.Y., might be in motivating students to pay attention.

“We know that if you train attention, then you’ll be more successful at various cognitive

tasks,” he added.

Some of the researchers also identified genes that might play a role in predisposing children toward an interest in the arts.

“It’s an important first step, but what we really need are experimental studies with large samples,” said Ellen Winner, a psychology professor at Boston College who studies arts learning but was not part of the Dana Consortium. “We can’t conclude anything about causality from correlational studies,” she added.

Interrelationships

Only one of the studies, in fact, involved a randomized study directly related to arts learning. Researchers at the University of Oregon, led by Helen Neville, a professor of psychology and neuroscience, randomly assigned 88 children taking part in the federal Head Start program for disadvantaged preschoolers to a variety of different learning groups.

One group of 26 children met in small groups with teachers for music-related activities. Another group of 19 children received classwide Head Start instruction, while another, similar-sized group got the same instruction in smaller teacher-pupil groups. A fourth group of 23 children received small-group instruction in focusing attention and becoming aware of details.

All the special classes were 40 minutes long and took place four days a week.

Spatial skills and other nonverbal IQ skills did improve in the music students over the course of the eight-week study, but that was also true for the children who got attention training and the Head Start children who worked in small groups. Only the children in the large Head Start class failed to make any progress in those areas.

Those results, the researchers conclude, “may derive from the fact that music training typically involves time being individually tutored, or being in a small group, which may itself increase opportunities for training attention.”

Nonetheless, arts advocates and many of the researchers taking part in the project see the report’s overall findings as important fodder for ongoing efforts to dissuade schools from dropping arts instruction in the face of pressure under the federal No Child Left Behind law to raise students’ test scores in mathematics, reading, and science.

“What we are seeing here is that we have quantitative data that confirm our assumptions about the interrelationships in the way children learn,” said poet Dana Gioia, the chairman of the National Endowment for the Arts, at the Dana conference. “And the purpose of education is to realize the full human potential of every child.”

Coverage of education research is sponsored in part by a grant from the Spencer Foundation.

Vol. 27, Issue 27, Pages 1,10-11

Why Arts Education Is Crucial, and Who's Doing It Best

"Art does not solve problems, but makes us aware of their existence," sculptor Magdalena Abakanowicz has said. Arts education, on the other hand, does solve problems. Years of research show that it's closely linked to almost everything that we as a nation say we want for our children and demand from our schools: academic achievement, social and emotional development, civic engagement, and equitable opportunity.

Involvement in the arts is associated with gains in math, reading, cognitive ability, critical thinking, and verbal skill. Arts learning can also improve motivation, concentration, confidence, and teamwork. A 2005 [report by the Rand Corporation about the visual arts](#) [1] argues that the intrinsic pleasures and stimulation of the art experience do more than sweeten an individual's life -- according to the report, they "can connect people more deeply to the world and open them to new ways of seeing," creating the foundation to forge social bonds and community cohesion. And strong arts programming in schools helps close a gap that has left many a child behind: From Mozart for babies to tutus for toddlers to family trips to the museum, the children of affluent, aspiring parents generally get exposed to the arts whether or not public schools provide them. Low-income children, often, do not. "Arts education enables those children from a financially challenged background to have a more level playing field with children who have had those enrichment experiences," says Eric Cooper, president and founder of the [National Urban Alliance for Effective Education](#) [2].

It has become a mantra in education that No Child Left Behind, with its pressure to raise test scores, has reduced classroom time devoted to the arts (and science, social studies, and everything else besides reading and math). Evidence supports this contention -- we'll get to the statistics in a minute -- but the reality is more complex. Arts education has been slipping for more than three decades, the result of tight budgets, an ever-growing list of state mandates that have crammed the classroom curriculum, and a public sense that the arts are lovely but not essential.

This erosion chipped away at the constituencies that might have defended the arts in the era of NCLB -- children who had no music and art classes in the 1970s and 1980s may not appreciate their value now. "We have a whole generation of teachers and parents who have not had the advantage of arts in their own education," says Sandra Ruppert, director of the [Arts Education Partnership](#) [3] (AEP), a national coalition of arts, business, education, philanthropic, and government organizations.

Yet against this backdrop, a new picture is emerging. Comprehensive, innovative arts initiatives are taking root in a growing number of school districts. Many of these models are based on new findings in brain research and cognitive development, and they embrace a variety of approaches: using the arts as a learning tool (for example, musical notes to teach fractions); incorporating arts into other core classes (writing and performing a play about, say, slavery); creating a school environment rich in arts and culture (Mozart in the hallways every day) and hands-on arts instruction. Although most of these initiatives are in the early stages, some are beginning to rack up impressive results. This trend may send a message to schools focused maniacally, and perhaps counterproductively, on reading and math.

"If they're worried about their test scores and want a way to get them higher, they need to give kids more arts, not less," says Tom Horne, Arizona's state superintendent of public instruction. "There's lots of evidence that kids immersed in the arts do better on their academic tests."

Education policies almost universally recognize the value of arts. Forty-seven states have arts-education mandates, forty-eight have arts-education standards, and forty have arts requirements for high school graduation, according to the 2007-08 AEP state policy database. The [Goals 2000 Educate America Act](#) [4], passed in 1994 to set the school-reform agenda of the Clinton and Bush administrations, declared art to be part of what all schools should teach. NCLB, enacted in 2001, included art as one of the ten core academic subjects of public education, a designation that qualified arts programs for an assortment of federal grants.

In a 2003 report, "[The Complete Curriculum: Ensuring a Place for the Arts and Foreign Languages in American's Schools](#)," [5] a study group from the National Association of State Boards of Education noted that a substantial body of research highlights the benefits of arts in curriculum and called for stronger emphasis on the arts and foreign languages. As chairman of the [Education Commission of the States](#) [6] from 2004 to 2006, Mike Huckabee, then governor of Arkansas, launched an initiative designed, according to commission literature, to ensure every child has the opportunity to learn about, enjoy, and participate directly in the arts.

Top-down mandates are one thing, of course, and implementation in the classroom is another. Whatever NCLB says about the arts, it measures achievement through math and language arts scores, not drawing proficiency or music skills. It's no surprise, then, that many districts have zeroed in on the tests. A 2006 national survey by the [Center on Education Policy](#) [7], an independent advocacy organization in Washington, DC, found that in the five years after enactment of NCLB, 44 percent of districts had increased instruction

time in elementary school English language arts and math while decreasing time spent on other subjects. A follow-up analysis, released in February 2008, showed that 16 percent of districts had reduced elementary school class time for music and art -- and had done so by an average of 35 percent, or fifty-seven minutes a week.

Some states report even bleaker numbers. In California, for example, participation in music courses dropped 46 percent from 1999-2000 through 2000-04, while total school enrollment grew nearly 6 percent, according to a study by the [Music for All Foundation](#) [8]. The number of music teachers, meanwhile, declined 26.7 percent. In 2001, the [California Board of Education](#) [9] set standards at each grade level for what students should know and be able to do in music, visual arts, theater, and dance, but a statewide study in 2006, by [SRI International](#) [10], found that 89 percent of K-12 schools failed to offer a standards-based course of study in all four disciplines. Sixty-one percent of schools didn't even have a full-time arts specialist.

Nor does support for the arts by top administrators necessarily translate into instruction for kids. For example, a 2005 report in Illinois found almost no opposition to arts education among principals and district superintendents, yet there were large disparities in school offerings around the state.

In many districts, the arts have suffered so long that it will take years, and massive investment, to turn things around. New York City mayor Michael Bloomberg has made arts education a priority in his school reform plans, and the city has launched sweeping initiatives to connect more students with the city's vast cultural resources. Nearly every school now offers at least some arts instruction and cultural programming, yet in 2007-08, only 45 percent of elementary schools and 33 percent of middle schools provided education in all four required art forms, according to an analysis by the [New York City Department of Education](#) [11], and only 34 percent of high schools offered students the opportunity to exceed the minimum graduation requirement.

Yet some districts have made great strides toward not only revitalizing the arts but also using them to reinvent schools. The work takes leadership, innovation, broad partnerships, and a dogged insistence that the arts are central to what we want students to learn.

In Dallas, for example, a coalition of arts advocates, philanthropists, educators, and business leaders have worked for years to get arts into all schools, and to get students out into the city's thriving arts community. Today, for the first time in thirty years, every elementary student in the [Dallas Independent School District](#) [12] receives forty-five minutes a week of art and music instruction. In a February 2007 op-ed piece in the *Dallas Morning News*, Gigi Antoni, president

and CEO of [Big Thought](#) [13], the nonprofit partnership working with the district, the [Wallace Foundation](#) [14], and more than sixty local arts and cultural institutions, explained the rationale behind what was then called the [Dallas Arts Learning Initiative](#) [15]: "DALI was created on one unabashedly idealistic, yet meticulously researched, premise -- that students flourish when creativity drives learning."

The Minneapolis and Chicago communities, too, are forging partnerships with their vibrant arts and cultural resources to infuse the schools with rich comprehensive, sustainable programs -- not add-ons that come and go with this year's budget or administrator.

In Arizona, Tom Horne, the state superintendant of public instruction, made it his goal to provide high-quality, comprehensive arts education to all K-12 students. Horne, a classically trained pianist and founder of the Phoenix Baroque Ensemble, hasn't yet achieved his objective, but he has made progress: He pushed through higher standards for arts education, appointed an arts specialist in the state Department of Education, and steered \$4 million in federal funds under NCLB to support arts integration in schools throughout the state. Some have restored art and music after a decade without them.

"When you think about the purposes of education, there are three," Horne says. "We're preparing kids for jobs. We're preparing them to be citizens. And we're teaching them to be human beings who can enjoy the deeper forms of beauty. The third is as important as the other two."

Fran Smith is a contributing editor for *Edutopia*.

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Interrelationships

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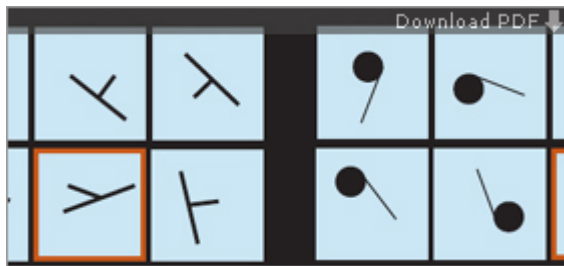
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How Arts Training Improves Attention and Cognition

By Michael I. Posner, Ph.D., and Brenda Patoine

September 14, 2009

Does education in the arts transfer to seemingly unrelated cognitive abilities? Researchers are finding evidence that it does. Michael Posner argues that when children find an art form that sustains their interest, the subsequent strengthening of their brains' attention networks can improve cognition more broadly.

If there were a surefire way to improve your brain, would you try it? Judging by the abundance of products, programs and pills that claim to offer “cognitive enhancement,” many people are lining up for just such quick brain fixes. Recent research offers a possibility with much better, science-based support: that focused training in any of the arts—such as music, dance or theater—strengthens the brain's attention system, which in turn can improve cognition more generally. Furthermore, this strengthening likely helps explain the effects of arts training on the brain and cognitive performance that have been reported in several scientific studies, such as those presented in May 2009 at a neuroeducation summit at Johns Hopkins University (co-sponsored by the Dana Foundation).

We know that the brain has a system of neural pathways dedicated to attention. We know that training these attention networks improves general measures of intelligence. And we can be fairly sure that focusing our attention on learning and performing an art—if we practice frequently and are truly engaged—activates these same attention networks. We therefore would expect focused training in the arts to improve cognition generally. Some may construe this argument as a bold associative leap, but it's grounded in solid science. The linchpin in this equation is the attention system. Attention plays a crucial role in learning and memory, and its importance in cognitive performance is undisputed. If you really want to learn something, pay attention! We all know this intuitively, and plenty of strong scientific data back it up.

The idea that training in the arts improves cognition generally really is not so bold within the context of what we call activity-dependent plasticity, a basic tenet of brain function. It means that the brain changes in response to what you do. Put another way, behavior shapes and sculpts brain networks: What you do in your day-to-day life is reflected in the wiring patterns of your brain and the efficiency of your brain's networks. Perhaps nowhere is this more evident than in your attention networks.

1. For most of us, if we find an art that “works” for us—that incites our passion and engages us wholeheartedly—and we stick with it, we should notice improvements in other cognitive areas in which attention is important, such as learning and memory, as well as improving cognition in general.

Solid Data Begin to Emerge:

If our hypothesis is true, why have scientists been unable to nail down a cause-and-effect relationship between arts education and cognition—for example, “[X] amount of training in art form [Y] leads to a [Z] percent increase in IQ scores”? Such a relationship is difficult to confirm scientifically because there are so many variables at work; scientists have only begun to look at this relationship in a systematic, rigorous fashion.

Early tests of the idea that the arts can boost brainpower focused on the so-called “Mozart effect.” A letter published in 1993 in the journal *Nature* held that college students exposed to classical music had improved spatial reasoning skills, which are important to success in math and science. This observation set off a wave of marketing hype that continues to this day. Despite numerous efforts, however, scientists have not reliably replicated the phenomenon. Nonetheless, these studies have involved only brief periods of exposure to music, rather than explicit musical training or practice.

2. More recent attempts to link arts training with general improvements in cognition have relied on a different approach. Researchers have focused on longer periods of engaged participation and practice in arts training rather than simple exposure to music. For example, in 2004, E. Glenn Schellenberg of the University of Toronto at Mississauga published results from a randomized, controlled study showing that the IQ scores of 72 children who were enrolled in a yearlong music training program increased significantly compared with 36 children who received no training and 36 children who took drama lessons. (The IQ scores of children taking drama lessons did not increase, but these children did improve more than the other groups on ratings of selected social skills.)

3. In a study published in the *Journal of Neuroscience* in March 2009, researchers Ellen Winner of Boston College, Gottfried Schlaug of Harvard University and their colleagues at McGill University used neuroimaging scans to examine brain changes in young children who underwent a four-year-long music training program, compared with a control group of children who did not receive music training.

4. In the first round of testing, after 15 months, the researchers found structural changes in brain circuits involved in music processing in the children who received training. They did not find the same changes in the control group. The scientists also found improvements in musically relevant motor and auditory skills, a phenomenon called near transfer. In this case, the improvements did not transfer to measures of cognition less related to music—termed far transfer. We do not know why far transfer to IQ, for example was found in the Schellenberg study and not in this one.

Taken as a whole, the findings to date tell us that music training can indeed change brain circuitry and, in at least some circumstances, can improve general cognition. But they leave unsettled the question of under what circumstances training in one cognitive area reliably transfers to improvements in other cognitive skills. From our perspective, the key to transfer is diligence: Practicing for long periods of time and in an absorbed way can cause changes in more than the specific brain network related to the skill. Sustained focus can also produce stronger and more efficient attention networks, and these key networks

in turn affect cognitive skills more generally.

The practice of various art forms involves different sensory and motor areas in the brain. (Courtesy of M. Posner.)

Practicing a skill, either in the arts or in other areas, builds a rich repertoire of information related to the skill. Scientists conducting neuroimaging studies of many human tasks have identified networks of widely scattered neural structures that act together to perform a given skill, which may involve sensory, motor, attentional, emotional and language processes. The arts are no exception: Specific brain networks underlie specific art forms. As we practice a task, its underlying network becomes more efficient, and connections among brain areas that perform different aspects of the task become more tightly integrated.

This process is analogous to an orchestra playing a symphony. The music that results from the integration of orchestral sections is likely to sound more fluid the hundredth time they play a piece than the first time.

Training Attention Networks:

A large body of scientific evidence shows that repeated activation of the brain's attention networks increases their efficiency. Neuroimaging studies have also proved that the following specialized neural networks underlie various aspects of attention:

- * the alerting network, which enables the brain to achieve and maintain an alert state;
- * the orienting network, which keeps the brain attuned to external events in our environment;
- * the executive attention network, which helps us control our emotions and choose among conflicting thoughts in order to focus on goals over long periods of time.

I have been particularly interested in the executive attention network. Executive attention skills, especially the abilities to control emotions and to focus thoughts (sometimes called cognitive control), are critical aspects of social and academic success throughout childhood. Empathy toward others, the ability to control reward-motivated impulses and even control of the propensity to cheat or lie have been linked scientifically to aspects of executive attention.

5/6. Researchers also have shown that measures of this network's efficiency are related to school performance.

Brain networks that underlie different aspects of attention include the alerting network, the orienting network and the executive attention network. Arts learning may contribute to improved cognition by improving the efficiency of the executive attention network. (Courtesy of M. Posner.)

Given the importance of the executive attention network, my colleagues and I wondered

what might improve its efficiency. To find out, we adapted a series of exercises, originally designed to train monkeys for space travel, to investigate the effects of attention-training exercises in 4-to 6-year-old children. We randomly assigned the children to either a control condition (which involved watching and responding to interactive videos) or training on joystick-operated computer exercises designed to engage attention networks through motivation and reward (see the image at top right). After the children who did the computer exercises participated in five days of training for about 30 minutes per day, we placed noninvasive electrodes on the children's scalp to look at their brain activity; we found evidence of increased efficiency in the executive attention network. The experimental group's network performance, in contrast to the control group's, resembled performance in adults. Importantly, this improvement transferred to higher scores on IQ tests designed for young children.

These data suggest that increasing the efficiency of the executive attention network also improves general cognition as measured by IQ.

7. M. Rosario Rueda of the University of Granada, Spain, and colleagues subsequently replicated this key finding in an as yet unpublished study of Spanish children. Rueda found that attention training improved the children's abilities to delay reward, and the improvements persisted for at least two months after training.

In recent years, various approaches to training children to pay attention have been carried out in many different settings. The results show that tasks specifically designed to exercise the underlying networks can indeed improve attention, and that this kind of training can translate to better general cognition. In one of the strongest studies to support this finding, measures of cognitive control significantly improved in preschoolers enrolled in a yearlong training program that incorporated different activities designed to sharpen executive functions.

8. We expect that this training will positively affect the children's future academic performance, but this remains to be shown.

For many children, interest in a particular art form leads to sustained attention when practicing that art form. Moreover, engaging in art often involves resolving conflicts among competing possible responses, such as when choosing the correct note to play at a given moment. The ability to resolve conflict among competing responses is also a crucial aspect of attention training. For example, if you are to respond to a target arrow by pressing a key in the direction in which the arrowhead points, the addition of surrounding arrows pointing in the opposite direction will increase your reaction time and activate parts of the executive attention network.⁸ We expect, therefore, that arts training should exercise the executive attention network and, therefore, also should improve cognition generally.

One Size Doesn't Fit All

It seems unlikely that training in the arts will always improve general cognition, however,

since so many factors are at play. No single art form is interesting to all people, and some people may never warm up to any type of art. Individual differences in relevant brain networks, which are probably genetically influenced to some degree, help explain this variability in both appreciation of and ability to create art. For example, one person may have an auditory system that easily discriminates between tones and a motor system optimized for fine finger control, which may predispose her to playing a musical instrument. Someone with agility, coordination and a good ability to imitate motions of others, on the other hand, might naturally gravitate toward dance or sports. These differences may also help explain why people are passionate about one type of art but not others.

The efficacy of arts training also depends on a child's temperament or personality. For example, openness, which affects behavior, may be a prerequisite to effective training, and may in part be genetically derived. We have found, for instance, that a gene that regulates the transmission of the chemical dopamine from one brain cell to another appears to modulate children's openness to parental influence. Our studies show that children with one form of this gene (the dopamine-4 receptor gene) show abnormally high sensation-seeking behavior if their parents show poor parenting skills, but not if their parents show good parenting skills.

9/10. An increasing body of evidence indicates that the brain's attention networks are also under some degree of genetic control. For example, certain genes seem to modulate an individual's ability to perform attention-related tasks, such as quickly responding to a warning signal or shifting attention from one external event to another. These genetic influences underscore individual differences in responses to training, and they may explain contradictory results in scientific studies investigating the links between arts training and cognition.

Apart from these caveats, exposure to the "right" art form can fully engage children's attention and can be highly rewarding for them. They may get so involved in learning the art that they lose track of time or even "lose themselves" while practicing it. I believe that few other school subjects can produce such strong and sustained attention that is at once rewarding and motivating. That is why arts training is particularly appealing as a potential means for improving cognition. Other engaging subjects might be useful as well, but the arts may be unique in that so many children have a strong interest in them.

With advances in neuroscience that are providing important new tools for studying cognition, it is important for researchers to work with educators to design and carry out studies that build upon the findings that arts training provides near-transfer effects, and determine whether this training also results in—and causes—far-transfer cognitive benefits. As we have seen, recent studies have transcended the failed paradigm of simply exposing people to the arts, and now concentrate on the effects of arts training over months and years. We need more studies like these to determine whether, beyond strong correlation, causation occurs. Arts training may influence cognition through other brain processes as well. Because arts training strengthens the brain network related to the art being practiced, other tasks that rely on the same brain circuitry or pieces of it

presumably would be affected. For example, if music training influences the auditory system, we might also expect to see improvement in nonmusical tasks involving pitch. In fact, Brian Wandell and his colleagues at Stanford University recently demonstrated that children who train in music or the visual arts showed improved phonological awareness, the ability to manipulate speech sounds, which is strongly tied to reading fluency. Moreover, the more music training they had, the better their reading fluency.

11. In addition, parts of the music network lie adjacent to brain areas involved in processing numbers, which might explain anecdotal reports of improvements in mathematics after music training. For instance, Elizabeth Spelke of Harvard University has found that school-age children engaged in intensive music training had improved performance in abstract geometry tasks.

12. Wandell and his team also reported preliminary data connecting experience in the visual arts with children's math calculation abilities.

13. Future studies will need to examine these possibilities in more detail.

Another interesting aspect of the performing arts is that artists often prepare for their work by consciously entering a state of mind that they believe will elevate their performance, for example, via deep breathing, picturing the moment or other meditative techniques. Yi-Yuan Tang, a visiting professor at the University of Oregon from Dalian Medical University in China, recently reported that some forms of meditation can produce changes in the connection between the brain and the parasympathetic branch of the autonomic nervous system and, after just a few days of training, can lead to improvements in the same aspects of executive attention that are trained by specifically exercising this network.

14. This "attention state" also correlates with improved mood and resistance to stress. Our data suggest that meditation may contribute to generalized cognitive improvements in those who practice it.

The growing body of scientific work that suggests arts training can improve cognitive function—including our view, which identifies stronger attention networks as the mechanism—opens a new avenue of study for cognitive researchers. The new research findings also give parents and educators one more reason to encourage young people to find an art form they love and to pursue it with passion. Continuing research in this area can also help inform ongoing debates about the value of arts education, which has important policy implications given budgetary pressures to cut arts programs from school curricula.

From our perspective, it is increasingly clear that with enough focused attention, training in the arts likely yields cognitive benefits that go beyond "art for art's sake." Or, to put it another way, the art form that you truly love to learn may also lead to improvements in other brain functions.

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ATTITUDE IS EVERYTHING

The process of human change begins within us. We all have tremendous potential. We all desire good results from our efforts. Most of us are willing to work hard and to pay the price that success and happiness demand.

Each of us has the ability to put our unique human potential into action and to acquire a desired result. But the one thing that determines the level of our potential, that produces the intensity of our activity, and that predicts the quality of the result we receive is our attitude.

Attitude determines how much of the future we are allowed to see. It decides the size of our dreams and influences our determination when we are faced with new challenges. No other person on earth has dominion over our attitude. People can affect our attitude by teaching us poor thinking habits or unintentionally misinforming us or providing us with negative sources of influence, but no one can control our attitude unless we voluntarily surrender that control.

No one else "makes us angry." We make ourselves angry when we surrender control of our attitude. What someone else may have done is irrelevant. We choose, not they. They merely put our attitude to a test. If we select a volatile attitude by becoming hostile, angry, jealous or suspicious, then we have failed the test. If we condemn ourselves by believing that we are unworthy, then again, we have failed the test.

If we care at all about ourselves, then we must accept full responsibility for our own feelings. We must learn to guard against those feelings that have the capacity to lead our attitude down the wrong path and to strengthen those feelings that can lead us confidently into a better future.

If we want to receive the rewards the future holds in trust for us, then we must exercise the most important choice given to us as members of the human race by maintaining total dominion over our attitude. Our attitude is an asset, a treasure of great value, which must be protected accordingly. Beware of the vandals and thieves among us who would injure our positive attitude or seek to steal it away.

Having the right attitude is one of the basics that success requires. The combination of a sound personal philosophy and a positive attitude about ourselves and the world around us gives us an inner strength and a firm resolve that influences all the other areas of our existence.

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The New Science of Thank You

The two most important words you'll say today can change your life, and research is proving it.

By Deborah Norville, From Thank You Power: Making the Science of Gratitude Work for You
From Reader's Digest
October 2007

Making Progress

Some days, you just want to stay in bed and hope the world forgets you exist. David Patrick Columbia was having one of those days. New to New York City, he was worn down by the hustle and bustle, no longer excited and proud about relocating to Manhattan, as he had been weeks earlier. He'd imagined himself a hot young talent taking the magazine world by storm, only to end up doing grunt work as a low-level assistant on a barely-making-it salary. He couldn't afford his own place and felt uncomfortable sponging off a friend.

"I was rethinking everything—my ability as a writer, my career choice," he recalls. That Saturday morning, he wanted to stay in bed. But no, he had to fetch a photo for work.

It was cold, gray and damp when David headed across town. "I don't know what possessed me, but I decided to start counting things along the way that made me happy," he says. "I just wanted to see how many pleasing things I came across."

First on his list: a mother walking her baby, all bundled up in a stroller. "That little face just made me smile," he says. Then he saw a jet in the sky. "Flying has always captivated me." And so it went. From the sizzling smells at bistros to eye-catching store-window displays, David acknowledged one thing after another that brightened his mood. By the time he picked up that photo, he was feeling thankful he'd made the move to the Big Apple.

"I was reminded that I lived in an exciting, interesting and invigorating place," he says. "Whenever I'm feeling down, I do this. It makes me feel better." It's been more than 20 years since David took his "walk of thanks" across Manhattan. Now he's a successful entrepreneur in the media business and says his gratitude stroll helps him stay focused to this day.

What if, instead of wallowing in our misery, we all chose to focus on being valued by a dear friend, for example, or the memory of a colleague's face when she receives a surprise birthday cake at work, or the smooth ride we've had to work in the past week? As science is now proving, feeling grateful can actually make us healthier, literally. Practicing gratitude, acknowledging the blessings in our lives and making it a point to recognize the good things can change us positively. We'll sleep better and exercise more. We'll feel more optimistic. We'll be more alert and active. And if we do this over a

period of time, we'll realize that we're making progress toward our life goals.

A Higher Quality of Life

What David Patrick Columbia discovered in his own life, Robert Emmons, PhD, has proved in his lab. A professor of psychology at the University of California, Davis, Emmons has long been interested in the role gratitude plays in physical and emotional well-being.

Along with psychology professor Michael McCullough of the University of Miami, Emmons took three groups of volunteers and randomly assigned them to focus on one of three things each week: hassles, things for which they were grateful, and ordinary life events. The first group concentrated on everything that went wrong or was irritating to them, such as “the jerk who cut me off on the highway.” The second group homed in on situations they felt enhanced their lives, as in “My boyfriend is so kind and caring—I'm lucky to have him.” And the third group recalled recent everyday events, as in “I went shoe shopping.”

The results: The people who focused on gratitude were just flat-out happier. They saw their lives in favorable terms. They reported fewer negative physical symptoms such as headaches or colds, and they were active in ways that were good for them. They spent almost an hour and a half more per week exercising than those who focused on hassles. Plain and simple, those who were grateful had a higher quality of life.

Others around them recognized that too. “They noticed that these people had more joy, more energy. They could see that they were becoming more optimistic,” says Emmons. The grateful group “even seemed to be perceived as more helpful toward others, going out on a limb to help people.” Emmons was surprised by this result. “This is not just something that makes people happy, like a positive-thinking/optimism kind of thing. A feeling of gratitude really gets people to do something, to become more pro-social, more compassionate.” This did not happen in either of the other two groups.

Emmons and McCullough took their study, published in 2003, one step further. Rather than focus on hassles or blessings on just a weekly basis, they rounded up college students to do it every day. The researchers asked for specific personal details as well: how many alcoholic drinks the volunteers had, how many aspirin or other pain relievers they took, the quantity and quality of their sleep. They also asked volunteers to compare themselves with others: Are you better or worse off?

If you were going to have dinner with anyone, you'd want someone from the gratitude group at your table. Right off the bat, Emmons and his team recognized that there was something powerful about a regular gratitude check. And in a follow-up study, those who found something to appreciate every day were less materialistic— less apt to see a connection between life satisfaction and material things. They were more willing to part with their possessions. The bumper sticker that reads “The one with the most toys wins” was unlikely to be found on any of their cars.

Amplify Positive Feelings

The grateful people were less depressive, envious and anxious, and much more likely to help others, a fact not lost on those around them. When others were asked their impressions of the daily-gratitude students, they generally judged the students as empathetic, helpful and pro-social, more likely to put themselves out for others. The study found that the people who were consciously grateful:

- _ Felt better about their lives.
- _ Were more optimistic.
- _ Were more energetic.
- _ Were more enthusiastic.
- _ Were more determined.
- _ Were more interested.
- _ Were more joyful.
- _ Exercised more.
- _ Had fewer illnesses.
- _ Got more sleep.
- _ Were more likely to have helped someone else.

Related studies have found other benefits as well, all of which could arguably be linked to a grateful mind-set: clearer thinking, better resilience during tough times, higher immune response, less likelihood of being plagued by stress, longer lives, closer family ties, greater religiousness.

Along with thinner thighs and six-pack abs, this is a fairly comprehensive list of what most of us would wish for in life. “I have studied a lot of topics in the nearly 25 years since I’ve been in graduate school, and no topic has gotten more interest from people than this. It’s exciting,” says Emmons.

But the science doesn’t stop there. After being given a little bag of candies, doctors in a study conducted by psychologist Alice M. Isen, a Cornell University professor, were better able to process the facts of difficult medical cases and to think outside the box about what might be causing the ailments. It turns out that this way of being thanked—by receiving a small sweet—had a big payoff.

“The doctors who got the candy didn’t jump to conclusions,” Isen says. “They realized quickly what the domain of the illness was, and they were correct. But they continued to check their diagnosis against new information as it came in.” The doctors who received no candy at all were less likely to be as methodical.

Isen’s hypothesis is that the good feelings generated by something as simple as an expression of appreciation intervene in the release of dopamine, the chemical in the brain associated with happiness. As Isen explains, dopamine is released when people are feeling good or are excited by a challenge. It activates the parts of the brain in which complex thinking and conflict resolution are thought to be headquartered.

Isen has also found that positive emotions make people more helpful to others. And since

helping someone else makes people feel good about what they've done, the positive feelings continue and even amplify, creating more good feelings.

The Power of Gratitude

So how do we use all this science of gratitude in our lives? The power of gratitude takes just a few minutes a day. But it requires consistency and an open mind—and dedication. Says Emmons, “I think gratitude is a demanding quality, a rigorous quality. It’s a discipline, an exercise.” It may not come easily, but it can be developed. Here’s how:

Record your thanks.

Take a moment during the day—right before bedtime is usually best—to jot down three things that happened that day for which you are grateful. Anything that made you feel uplifted, that brought a smile to your face or your heart, or will contribute toward your future happiness, works.

After each situation or event for which you feel thankful, write down why this was good for you. Perhaps you received an e-mail from an old school friend who hadn’t been in touch for years, and this reminded you of the good times you had together. It forced you to realize that people think of you even though you’ve had no contact with them, which must mean you’re a pretty special person.

Also, make a note of who, if anyone, played a role in what you’ve recalled for the day and how that person had an impact on your life.

None of this sounds hard, right? Given the choice between this exercise and 50 sit-ups plus 25 push-ups, you’re much more inclined to pick up a pen, aren’t you?

The gratitude journal makes you look at life in a positive, concrete way, reminding you of its interconnectedness in a fast-paced, impersonal world and how much others add to the quality of your life. It forces you to focus on what went right instead of the inevitable things that went wrong. And it enhances your self-esteem.

See the patterns.

Over time, you’ll notice a consistency within the list of items you’re grateful for. Many entries will underscore the importance of people in your life. Others will highlight meaningful experiences. Still other items will be things that began with you, things you created that you can point to with pride and say, I made that happen. It’s called eudaemonia, the happiness or fulfillment that comes from the action itself, not the result of it. Any other benefits that come along—someone is grateful, your project is a success—are icing on the cake.

Catch the boomerang.

Gratitude, when expressed to others, almost always comes back around. People who feel appreciated are more willing to make an effort for those who make them feel valued. In one study, waitresses who simply wrote “thank you” on the check before handing it to their customers received, on average, 11 percent more in tips than those who didn’t.

Waitresses who wrote a message about an upcoming dinner special on the checks also received higher tips—on average, 17 to 20 percent higher. In a world where personal connections seem increasingly limited, and sometimes stressful when they do occur, gratitude resonates.

Seize the moment.

Look around you: What's right with your world? If you have a hobby, practice it. If you don't, find one. Reach out to others; share something. A small gesture toward another individual costs you little but can bring many benefits. All these actions increase your opportunities to feel grateful.

Says Barbara Fredrickson, a psychologist at the University of North Carolina, "Gratitude has the potential to change everything from its ordinary state to being a gift."

Now, that's saying a lot.

Grace Notes

The etymology of the word gratitude helps explain it. Gratitude originates from the Latin word *gratus*—meaning "thankful, pleasing"—which has its roots in *gratia*, which means "favor, pleasing quality or goodwill." Derivatives of the Latin root can be found in many other languages. In Lithuanian, *gririti* means "to praise or celebrate." In the 13th century, the short prayer before a meal came to be called grace. And in Greek, the word for "grace" is *charis*—the root of the word *charisma*.

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SELF- MANAGEMENT STRATEGIES

Self- management is your ability to use awareness of your emotions to actively choose what you say and do.

On the surface, it may seem that self- management is simply a matter of taking a deep breath and keeping yourself in check when emotions come on strong, and while it's true that self-control in these situations is a sizable piece of the pie, there's far more to self-management than putting a cork in it when you're about to blow up. Your eruptions are no different from a volcano—there is all sorts of rumbling happening beneath the surface before the lava starts flowing. Unlike a volcano, there are subtle things you can do each and every day to influence what is happening beneath the surface. You just need to learn how to pick up on the rumbling and respond to it. Self-management builds upon a foundational skill — self-awareness. Ample self- awareness is necessary for effective self- management because you can only choose how to respond to an emotion actively when you're aware of it. Since we're hard-wired to experience emotions before we can respond to them, it's the one- two punch of reading emotions effectively and then reacting to them that sets the best self- managers apart. A high level of self-management ensures you aren't getting in your own way and doing things that limit your success. It also ensures you aren't frustrating other people to the point that they resent or dislike you. When you understand your own emotions and can respond the way you choose to them, you have the power to take control of difficult situations, react nimbly to change, and take the initiative needed to achieve your goals.

When you develop the ability to size yourself up quickly and grab the reins before you head in the wrong direction, it keeps you flexible and allows you to choose positively and productively how to react to different situations. When you don't stop to think about your feelings—including how they are influencing your behavior now, and will continue to do so in the future—you set yourself up to be a frequent victim of emotional hijackings. Whether you're aware of it or not, your emotions will control you, and you'll move through your day reacting to your feelings with little choice in what you say and do. The remainder of this chapter presents 17 specific strategies—things you can start doing today—that will help you manage your emotions to your benefit. Each simple strategy is targeted to an important element of the self management skill. This carefully crafted set has been honed through many years of testing with people just like you, and are proven methods for increasing your self-management skill. As you master each of the strategies and incorporate them into your daily routine, you will develop an increased capacity to respond effectively to your emotions. Of course no matter how skilled you become in managing your emotions there are always going to be situations that push your buttons. Your life won't morph into a fairy tale devoid of obstacles, but you will equip yourself with everything you need to take the wheel and drive.

SELF-MANAGEMENT STRATEGIES

1. Breathe Right
2. Create an Emotion vs. Reason List
3. Make Your Goals Public
4. Count to Ten
5. Sleep On It
6. Talk To a Skilled Self-Manager
7. Smile and Laugh More
8. Set Aside Some Time in Your Day for Problem Solving
9. Take Control of Your Self-Talk
10. Visualize Yourself Succeeding
11. Clean Up Your Sleep Hygiene
12. Focus Your Attention on Your Freedoms Rather than Your Limitations
13. Stay Synchronized
14. Speak to Someone Who is Not Emotionally Invested in Your Problem
15. Learn a Valuable Lesson from Everyone You Encounter
16. Put a Mental Recharge into Your Schedule
17. Accept That Change is Just around the Corner

College education is a highly formative experience. It proves eventful and life-shaping for students of any age. College provides a uniquely powerful moment in which students rethink their lives, expand their intellectual and cultural horizons, and focus on future goals, often in new ways. Yet, we suspect that when they reflect on their time in higher education, many graduates feel a gnawing sense that something important was missing, that the overall educational experience could have been more helpful in enabling them to come to grips with their lives.

In their catalogues and advertising, universities and colleges frequently speak of preparing their graduates to live discerning and responsible lives. This is especially true of institutions that lay claim to a heritage of liberal education. But few institutions of higher learning devote significant curricular attention to questions of purpose, vocation or personal meaning. Why is this so? We believe that this neglect of direction, meaning and other aspects of personal responsibility as serious educational goals is the unintended consequence of too narrow a pursuit of higher education's most cherished value: analytical thinking.

Analytical thinking involves making sense of particular events in terms of general concepts and then manipulating those concepts according to general rules or principles. Analytical thinking involves framing the particularity of actual experience in terms of categories at a higher level of abstraction. This is "rigorous" thinking that is central to modern societies. It enables scientific explanation and theory-building, and their powerful application in technological innovation. These skills play an important part in making democratic as well as academic or intellectual life possible. Analytical thinking is a necessary skill for modern living, and most entering students need considerable help to gain the essential intellectual skills analytical thinking entails.

Our quarrel, then, is not with analytical thinking itself but rather with the tendency in the academy to treat analytical thinking, along with mastery of substantive content, as sufficient goals for higher education. When this happens, the over-emphasis on analytical thinking creates an academic culture that reveres analytical rigor as the only important consideration, disconnecting rigorous thinking from sources of human meaning and value. This threatens to create a culture of argument that is so skeptical and detached that it can become unmoored from the human purposes that rationality and rigor are meant to serve. Analytical thinking teaches students how to argue all sides of an issue, but pursued by itself, it often leaves them with the sense that the ultimate choice of where to come down is arbitrary. One result is that humanities disciplines, in particular, come to be regarded by students as trading in mere "opinion" as opposed to rigorously demonstrated "facts"—which appear the only kind of knowledge worth having.

This is not a new problem. At the source of Western rationality, Plato already was

warning about the nihilistic potential of acquiring skills of critical argument that are not well grounded by a moral compass. Plato has Socrates humorously compare such unmoored, fledgling dialecticians to young hounds who discover they can tear to bits any argument, making the weaker and worse case seem like the stronger and better one. (Many academics, perhaps, can recognize in this description more than a few young and not-so-young hounds they have encountered.)

Analytical thinking is an incomplete educational agenda in part because it disconnects rationality from purpose, and academic understanding from practical understanding or judgment. In order to prepare for decision and action in the world, students need to develop not only facility with concepts and critical analysis but also judgment about real situations in all their particularity, ambiguity, uncertainty and complexity. They need to develop practical reasoning.

Despite the challenge this near-exclusive emphasis on analytical reasoning poses, we believe that higher education can be reshaped so that it better serves the cultivation of students' sense of purpose and responsibility, even as it continues to strengthen the rigor of their thinking. Once recognized, the thinness of the way critical thinking is currently presented to students can be corrected. In fact, resources for such correction and enrichment are already present in many parts of the university, although they may not be recognized as such.

In the Carnegie Foundation's studies of undergraduate preparation in fields such as engineering, nursing and business, we have discovered that when professions confront the problem of shaping students to be competent and responsible future practitioners of their fields, they inevitably have to invent ways of teaching practical reasoning to guide and direct analytical capacities. Some even find ways to connect these teaching practices with concerns about meaning and purpose in the arts and sciences disciplines, thus bridging the notorious divide between "pure" and "applied" learning.

Plato might be surprised by this finding, but we suspect he would also be pleased. Like Moliere's character who suddenly discovers that he has been speaking prose all his life, a more focused attention to how and where practical reasoning is being taught may bring today's academy to rediscover in some of its peripheries ways to bring essential but too often neglected purposes of higher education back to the center of attention.

SUCCESS-"FOOL".doc
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LEADERSHIP:

Are you successful or a "success fool"? According to HBS alum and leadership expert Jagdish Parikh, the most effective leaders realize they must first learn the skill of leading themselves.

by Jagdish Parikh

Editor's note: Jagdish Parikh (HBS MBA '54), was a recent guest of the HBS Leadership and Values Committee in the Distinguished Speakers Series. We asked him to write about the subject of his talk, "Leading Your Self," based on his book *Managing Your Self*.

How can the concept of leadership be so rich in knowledge yet so poor in performance? Hundreds of books and "models" purport to suggest the best way to become a leader. Yet many people, asked to name a leader they would consider a role model, struggle to identify even a few individuals.

The gap between what we learn about leadership and what we actually implement exposes a fundamental flaw in most of the leadership models today. These models focus mainly on competencies required for leading an organization, but do not explain how to cultivate those core competencies. Therefore we face, in a sense, a crisis of leadership.

Actually, this is more a crisis of courage than of leadership, because what is lacking today is not knowledge about leadership, but the courage to convert such knowledge into actual performance. But courage does not come just by wishing—it only happens as a consequence of one's level of consciousness, one's inner experience, one's self identity. In this sense, what we are witnessing today is actually a crisis of consciousness. To cope with this, one needs an understanding and experience of a deeper level of consciousness and a higher level of self identity, as a precondition for cultivating the competences for leading others.

This is what *Leading Your Self* is all about.

Unless one knows how to lead one's self, it would be presumptuous for anyone to be able to lead others effectively. And, if you don't lead your self, someone else will! Leading one's self implies cultivating the skills and processes to experience a higher level of self identity beyond one's ordinary, reactive ego level. This facilitates the journey from reactive constraints to proactive courage leading to creative consciousness—a synthesis of intellectual, intuitive, and emotional intelligence. This enables one to effectively manage relationships with people, events, and ideas, which is the essence of leadership.

In these days of accelerating change and complexity, every manager needs to keep their physical, mental, and emotional dimensions in the fittest condition. This can be done

through simple processes for minimizing stress, cultivating creativity, rebalancing emotions, and shared vision building, including Yogic exercises and meditation. "Leading Your Self" is the program that offers these with a unique synthesis of western and eastern, modern and ancient, concepts and processes.

Is stress good for you?

Does stress bring out the best in us? Many executives seem conditioned into believing that stress is beautiful—it pushes us into higher performance, they believe. Surprisingly, they even declare you should never be satisfied with your performance because satisfaction will dampen the drive to do more and better.

Leadership is not just a personality trait, strategy, or tactic

I, too, took on this mindset as an MBA student at HBS. I went to Bombay and became successful as a businessman practicing these tenets but began to suffer negative physiological and psychological symptoms of stress after just a few years.

At this stage, I seriously began to wonder if there was another way to be successful while also remaining satisfied and happy at the same time. After deep reflection and a PhD, I discovered that the missing link between success and happiness was lack of awareness of one's "inner dynamics."

It is essential to understand and learn to manage and lead one's own inner dynamics, one's own self, in order to achieve sustainable peak performance and a continuing experience of inner fulfillment. Often many people do perform at a peak level, but this is largely through a fear of losing—losing what one has accomplished now and what could be accomplished in the future. Fear creates peak performance by generating adrenaline, which is very energizing and addictive. But adrenaline is also self-consuming and not sustainable.

To achieve sustainable peak performance, learn to transform your motivation from fear of losing to joy of doing, which is a different chemistry—that of endorphins. I believe there are three fundamental laws of High Performance Dynamics:

1. One never does anything unless one feels like doing it, either through negative motivation, fear of losing or positive motivation, the joy of doing.
2. Unless you feel good within your own self, you can never bring about good results on a sustainable basis.
3. Feeling good is a skill: cultivating a deeper awareness of one's self. It can be learned like any other skill.

This becomes most relevant when understanding that the essence of leadership is recognizing, discovering, and identifying with one's true self. The issue is that leadership implies functioning with proactive and creative attitudes. The fact is that mostly we function with reactivity. Why is this so? Because we normally identify ourselves with our

body, mind, and emotions, which is a very narrow identity, described as the Ego identity. By its very nature Ego identity is bound to be self-centered and reactive.

How do we alter or expand our self identity? This can be experienced through a three-minute exercise called Performance Enhancing Process. PEP enables one to experience a sense of distancing, detaching from one's body, mind, and emotions and positioning one's awareness and experience deeper in one's "Inner Space," the "Inner Self," or the "Centered Self," which is also the "Proactive and the Creative Self."

The exercise is not only relaxing but also brings a positive, joyous feeling. In this way, one can function from that deeper, joyous, and proactive self through the ego, and not with the reactive Ego Self.

Each person, in a sense, is the owner/manager and observer/experiencer of his or her body, mind, and emotions. The simple metaphor of a chair, taken as representing one's body, mind, and emotion dynamics, can explain this clearly:

As long as I am sitting in the chair, (identifying with body, mind, and emotion), I cannot observe the whole chair nor "manage" the chair. In fact, the chair manages me! To observe the chair, I must get out of it. For this, I must first accept that I'm not the chair. The moment I can accept that, I can get out of it, and then I can manage, move, and lead the chair the way I want to. I become a master, a leader, of the chair.

This enables one to focus on developing the functionary dimensions of the self, namely, keeping the body healthy and energized, making the mind more open and creative, and preventing negative emotions.

That is why effective leadership is not just a personality trait, strategy, or tactic—not just a package of competencies. It is a transformative way of thinking, feeling, and functioning, a way of life, a way of being.

You can't lead something you yourself identify with. The paradox is that detachment (not withdrawal, escape, or indifference) coupled with involvement (not addiction)—in other words, detached involvement—enables mastery. Leadership then "happens" to you!

Tribute to Music Educators.doc

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IN TRIBUTE TO THE MUSIC EDUCATORS WE KNOW AND LOVE:

We sat in the audience and watched the beginner band start up the music. These were 6th Graders. Soon they'd be followed by the 7th Graders, and then the 8th Graders would finish off the night with their Christmas music and cheer.

The crowd was rowdy. No, really. They were rowdy. At a Christmas music recital.

Mostly because the middle schoolers weren't allowed to leave when their turn on stage was over. They had reserved places in the audience. And when the other grades finished a song, their schoolmates in the audience hooted and cheered and screamed. And what high-pitched screams they were! What happened? Did the Beatles walk onstage?

We've been to several of these recitals now. Each different but still the same. For example, there is almost always one instrument not quite tuned. Just a little flat. And maybe this student or that is a fraction off on timing. And maybe the flautist clearly had practiced one song more than the other. After all, these kids aren't pros. Or even college students. Or even high schoolers. They're middle schoolers, and they sound like it, bless 'em.

But at every concert, we get the same feeling as we watch the conductor step to the side and allow the musicians-in-training to bow: Music teachers must be the most underappreciated of all public school teachers. And that's saying a lot.

Imagine coming in day after day and trying to polish these kids into musicians, or reasonable facsimiles thereof. Imagine the, ahem, music the teacher hears that first semester.

And the teacher knows what good sounds like. Heck, he or she's probably a college graduate with a degree in music. How do you think it must feel when a kid on trombone hits a C instead of an E? Time and time and time again.

And how about the students' own parents? How much can they be into it? Who wants to hear a flat trumpet at all hours of the night? Hey, shouldn't that kid be studying for his math test instead?

And the pay is, well, public school teacher pay.

Then we attend a concert, and watch the teacher raise her magic wand, and everything comes together, a squeak here or there and all.

Does the teacher understand how important she is? Because this is music. This is 50 percent math, 50 percent talent, 50 percent mettle, 100 percent art and practice, practice, practice. What would life be without it? Band teaches teamwork, discipline, public performance, and, yes, dare we say it, an appreciation for truth and beauty. It teaches patience and, an increasingly undeveloped trait in these times, and maybe in any time, perseverance.

Does the music teacher realize she's putting these students on a course that will reap rewards for years? Even if they never pick up the instrument after 8th grade.

And what of those students who do continue to play? Maybe in a jazz combo when they're 50. Maybe behind a rock band on Saturday night. (What band can play "Give Me Some Lovin'" without horns?) Or maybe just in their backyard, playing the sax low and smooth, just for relaxation.

There's a lot of competition for this distinction, we know, but music teachers may be

the most unappreciated teachers of all.

And we'd like them to hear something today besides a C flat. We'd like them to hear this loud and clear: Thank you!

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