



THE HOLTON•ARMS SCHOOL

April 27, 2004

Trent E. Gabert
Chair, Executive Committee
Brock International Prize in Education
The University of Oklahoma
1700 Asp Ave., Room 226
Norman, OK 73072-6400

Information on Dr. Melvin Levine:

Dr. Melvin Levine has devoted his life to the understanding and support of children and adolescents with learning differences and attention issues. For over 25 years, he has worked to change the "one-size-fits-all" approach to education and believes that if we pay more attention to individual learning patterns, we can make all children successful in school. Dr. Levine is a Rhodes Scholar and graduate of Harvard Medical School. Currently he is a professor of pediatrics at the University of North Carolina and the Director of the Clinical Center for the Study of Development and Learning at the university. He is the founder and co-chair of All Kinds of Minds, which is a nonprofit institute that develops programs and materials to assist teachers, parents, clinicians and the children themselves deal with learning differences. He has also developed a program called Schools Attuned, supported by the Geraldine Dodge Foundation, a comprehensive professional development program for educators that provides classroom teachers the skills they need to meet the learning issues of all their students.

Dr. Levine has lectured to educators all over the world, and his presentations are always packed. He has written a number of books on the subject of learning differences and helping every child succeed, including A Mind at a Time, The Myth of Laziness, Learning Differences: Misunderstood Minds, and Getting A Head in School, a book for young people that helps demystify their learning differences.

Submitted by Diana Coulton Beebe, April 27, 2004

(Dr. Levine has confirmed that he will be available to travel to Norman, Oklahoma for the award ceremony in April, 2005.)

**Brock Prize
Nomination Packet for Dr. Mel Levine
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The Work of Dr. Mel Levine

Dr. Mel Levine is a developmental-behavioral pediatrician who specializes in school-age children and teenagers who are having problems with learning or experiencing other difficulties in school. His efforts in working with children, parents, and educators over the last 30 years have focused on celebrating individual variation during childhood and demystifying the learning process.

Dr. Levine's own childhood and school experiences had a strong influence on his work. As he tells the children he works with, he grew up on Long Island and had some hard times in school, suffering his own share of failure and embarrassment. In kindergarten he had trouble using scissors properly and colored over the lines. Later in elementary school, he had trouble staying organized, failed to hand in assignments, and did not get along with his fifth grade teacher. He was not athletic and was often left out, but he did develop a love for animals and wildlife. In high school he developed a love for writing and became the editor of the school newspaper, but struggled with his stylistic limitations and creative bottlenecks. He remembers that the pain of his early experiences was exacerbated by the fact that neither he nor any of the adults in his life were able to see or describe any of the factors contributing to his struggles, and he had no benefit or comfort from any kind of insight into his problems.

For college, Dr. Levine attended Brown University. He began studying literature and philosophy, becoming increasingly interested in epistemology and ethics. In the summer he worked as a camp counselor and began a life-long fascination with the way in which different students reacted to the challenges of the outdoors, hard work, and climbing mountains. Graduate study, medical school, internship and residency continued to solidify his interest in school age children and theories of knowledge. When he worked overseas as a pediatrician and school doctor during his tour of military duty in the Philippines, he began to see the possibilities for collaboration between pediatricians and schools. When he returned to Children's Hospital in Boston, he ran many outpatient clinics which were designed to help children with learning problems.

In this work, Levine came to realize that the evaluation of children with school difficulties and other functional problems was quite dependent on the specialized training of the individuals they consulted. Children seeing psychiatrists often ended up with a psychiatric diagnosis, or those seeing speech and language pathologists with primarily linguistic diagnosis, and so on. At the same time, he discovered that children were not always being fairly evaluated in their schools. Although Public Law 94-142 became important legislation, implementation was often compromised by budget concerns, rigidly enforced regulations, political conflicts of interest, and lack of consistent quality control. He and his colleagues began setting up multidisciplinary clinics for the independent evaluation of children. Their desire was to describe rather than label such children. Their goal was to identify strengths, styles, and weaknesses unique to each child.

As he has continued to evaluate children with school problems, Levine has found endless patterns of learning styles and of children's strength and weaknesses that have previously been unidentified. He believes that all too often, it is the uniqueness of children that contributes to their learning problems. He often reminds the educators and parents in his audiences that they have succeeded as adults because the adult world needs and rewards people with different strengths, weaknesses, and talents. Only when we are students in school are we expected to be generally good at everything. He feels that children are too complex to be characterized by simplistic labels, such as "ADD" or "dyslexic," and he would rather have us regard children with learning problems as functioning along a dynamic continuum of normal developmental variation while struggling to satisfy constantly evolving expectations. His goal is to demystify the learning process and the variations in these children and to help those around them accommodate their weaknesses, build on their strengths and remediate their skills.

Currently, Dr. Levine is professor of pediatrics at the University of North Carolina School of Medicine. He directs its Center for Development and Learning. He has written numerous books and articles and gives conferences and workshops all over the country. He has developed an on-line resource, called *All Kinds of Minds*, for parents and teachers, with articles, case studies, and more. He has also developed a program for schools, called *Schools Attuned*, which is designed to train teachers to notice learning style differences, diagnose them, and develop classroom strategies. He has written books and developed workbooks for school-aged children to help them understand their own learning styles and their own strengths and weaknesses. As they learn about their own minds, they move from being victims to being advocates for themselves. Dr. Levine's passion and life's work has been to understand neuro-developmental differences in children, educate parents, teachers, and pediatricians to move beyond labeling kids, help school-aged kids understand their own issues and build on their own strengths. He has developed workshops, a rich array of online resources, programs for schools and teachers, and materials for students, teachers, and parents to assist in this work.

The remainder of this packet provides additional information about Dr. Levine and his work, as well excerpts from books, articles and the supporting materials he has developed.

Submitted by Diana Coulton Beebe, Brock Prize Juror for 2005.

Updated 11/27/02

CURRICULUM VITAE**Melvin David Levine****PERSONAL DATA****Date of Birth and Place: January 20, 1940; New York, New York****EDUCATION**

1961 A.B., summa cum laude, Brown University, Providence, Rhode Island
1961-1963 Rhodes Scholar, Magdalen College, Oxford University, Oxford, England
1966 M.D., Harvard Medical School, Boston, Massachusetts
1966-1967 Medical Intern, The Children's Hospital, Boston, Massachusetts
1967-1967 Resident in Medicine, The Children's Hospital, Boston, Massachusetts

EXPERIENCE

1969-1971 Captain, USAF Medical Corps, Clark Air Force Base, The Philippines
1971-1975 Instructor in Pediatrics, Harvard Medical School
1971-1976 Pediatric Director, Macy Program for Nurse Practitioner Education
1971-1977 Associate in Medicine, The Children's Hospital, Boston, Massachusetts
1979-1984 Co-Director and Clinical Coordinator, Harvard Interfaculty Program in Medical Ethics, Harvard University
1972-1975 Associate Director, Community Child Health Division, the Children's Hospital, Boston, Massachusetts
1972-1976 Director, Medical Outpatient Department, The Children's Hospital, Boston, Massachusetts
1972-1984 Member of the Rhodes Scholarship Selection Committee for Massachusetts
1972-1983 Pediatric Director, Brookline Early Education Project, Brookline, Massachusetts
1975-1985 Director, Community Services Program, the Children's Hospital, Boston, Massachusetts
1979-1985 Member, Society for Pediatric Research
1979-1982 Board of Directors, Ambulatory Pediatric Association
1979-1983 Editorial Board, Pediatrics In Review
1979-1981 Panel Member, National Academy of Sciences Panel on Outcome Measurement in Early Childhood Programs
1980-1985 Associate Professor of Pediatrics, Harvard Medical School
1981-1985 Editorial Board, Journal of Developmental and Behavioral Pediatrics
1981 Member, American Pediatric Society

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1983-1985 Chairman, Committee on Developmental and Behavioral Dysfunction, Massachusetts Chapter, American Academy of Pediatrics
 1983-1985 Council Member and Director of Publications, Society for Behavioral Pediatrics
 1985 Professor of Pediatrics, University of North Carolina School of Medicine, Chapel Hill, North Carolina
 1985 Director, Clinical Center for the Study of Development and Learning, University of North Carolina School of Medicine, Chapel Hill, North Carolina
 1985-1994 Chairman, The Advisory Council, Elementary School Center, New York, New York
 1985-1992 Editorial Board Pediatrician, International Journal of Child and Adolescent Health
 1985-1995 Member, Scientific Advisory Board, National Center for Learning Disabilities
 1990 Rhodes Scholarship Selection Committee, North Carolina
 1987-1989 Editorial Board Pediatrics in Review
 1988 Editorial Board Devereux Review
 1989 Editorial Board Exceptionality
 1989-1991 Executive Committee Member, Section of Developmental-Behavioral Pediatrics, American Academy of Pediatrics
 1989-1990 President, Society for Behavioral Pediatrics
 1990 Editorial Board, Comprehensive Mental Health Care
 1989 National Advisory board, Association of Educational Therapists
 1990-1994 National Executive board Member, CHADD (Children With Attention Deficit Disorders)
 1990 Editorial Board Journal of Developmental and Behavioral Pediatrics
 1995 Co-Chairman of the Board, All Kinds of Minds, A Non-Profit Institute for the Understanding of Differences in Learning

LICENSES

North Carolina #29321

HONORS

1960 Jr. Phi Beta Kappa, Brown University Francis Wayland Scholarship, Brown University James Manning Scholarship, Brown University
 1971 The Meritorious Service Medal, United States Air Force
 1992 Orton Dyslexia Society. Outstanding Author Award.
 1994 Razor Walker Award
 1995 Star Foundation Award
 1995 Aldrich Award of the American Academy of Pediatrics
 1996 CHADD Hall of Fame Induction
 1997 Children's Champion Award, Los Angeles, California
 2002 Milton J. E. Senn Award for School Health, American Academy of Pediatrics

CERTIFICATION

1971 American Board of Pediatrics
 1971 Fellow, American Academy of Pediatrics

PUBLICATIONS

1. Levine, M.D. and Alpert, J.: Public knowledge of Ipecac syrup in the management of accidental poisonings. *Journal of Pediatrics* 71:890, 1967.
2. Levine, M.D. and Alpert, J.: A descriptive study of pediatric internship. *Pediatrics* 44:986, 1969.
3. Levine, M.D.: The assessment of medical predisposition to educational dysfunction: A progress report on the development of early life "at-risk inventories" in the Brookline Early Education Project, September 1973.
4. Levine, M.D., Camitta, B.N., Nathan, D., and Curran, W.J.: The medical ethics of bone marrow transplantation in children. *Journal of Pediatrics* 86:145-50, 1975.
5. Levine, M.D. and Hass, G.: Chapter 766 and "educational prescriptions." *New England Journal of Medicine* 292:1077, 1975.
6. Levine, M.D.: Children with encopresis: A descriptive analysis. *Pediatrics* 56:412, 1975.
7. Levine, M.D. and Liden, C.B.: Food for inefficient thought (Attentional disorders in childhood). *Pediatrics* 58:145, 1976.
8. Levine, M.D. and Bakow, H.: Children with encopresis: A treatment outcome study. *Pediatrics* 58:845, 1976.
9. Barr, R.G. and Levine, M.D.: The treatment of childhood enuresis. In Conn, *Current Therapy*, Philadelphia: W.B. Saunders, 1976.
10. Levine, M.D.: Disconnection: The clinician's view. In "The Quinlan Decision: Five Commentaries." *the Hastings Center Report* Vol. 6, no. 1:11, February 1976.
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12. Levine, M.D., Palfrey, J., Lamb, G., Weisberg, H., and Bryk, A.: Infants in a public school system: The indicators of Early Health Educational Need. *Pediatrics* 60 (suppl):579-587, 1977.
13. Levine, M.D. and Barr, R.: Constipation and Fecal Incontinence. In Hoeckelman et al (eds): *Principles of Pediatrics - Health care of the young*, New York: McGraw Hill, 1978.

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17. Barr, R.G., Levine, M.D., and Watkins, J.B.: Recurrent Abdominal Pain of Childhood Due to Lactose Intolerance, A Prospective Study. New England Journal of Medicine **300**:2449, 1979.
18. Dworkin, P., Shonkoff, J., Leviton, A., and Levine, M.D.: Training in Developmental Pediatrics: How Physicians Perceive the Gaps. American Journal of Diseases of Children. **133**:709, 1979.
19. Levine, M.D.: Reading Failure and the Learning Dyslabeled Child. Pediatrics, **63**:15, 1979.
20. Levine, M.D.: Developmental Dysfunction in the School-Age Child. In Behrman et al (eds): Nelson's Textbook of Pediatrics, 11th Edition, Philadelphia: W.B. Saunders Co., 1979.
21. Levine, M.D., Clark, T., Shonkoff, J.: A Plan for the Training of Pediatricians in the Care of Children with Special Educational Needs. In J. Smith (ed), A guide to personnel preparation programs: Albuquerque, University of New Mexico, 1979.
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25. Levine, M.D.: The Child with Learning Disabilities. In Scheiner, and Abrams, K. (eds): The Practical Management of The Developmentally Disabled Child. St. Louis, C.V. Mosby Co., 1980.

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67. Levine, M.D.: Constipation and Encopresis. In Gellis, S. and Kagan, B. (eds): Current Pediatric Therapy (11th ed.). Philadelphia: W.B. Saunders, 1984.
68. Meltzer, L., Levine, M.D., Karniski, W., Palfrey, J., and Clarke, A.: An Analysis of the Learning Styles of Adolescent Delinquents Journal of Learning Disabilities, 17:600, 1984.
69. Palfrey, J.S., Karniski, W., Clarke, S., Tomaselli, M., Meltzer, L., and Levine, M.D.: Health Profiles of Young Juvenile Delinquents. Public Health Reports, 98:449, 1983.
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71. Levine, M.D. and Zallen, B.: The Learning Disorders of Adolescents: Organic and Nonorganic Failure to Strive. Pediatric Clinics of North America, 31:345, 1984.
72. Levine, M.D.: The Disappointing Child: School Failure and Its Complications. Feelings and their Medical Significance, 25:5, 1983.
73. Levine, M.D.: Developmental Dysfunction In the School-Age Child. In Behrman, R., et al (eds): Nelson's Textbook of Pediatrics, 12th edition. Philadelphia: W.B. Saunders Company, 1983.

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74. Levine, M.D.: The Pediatric Early Elementary Examination. Cambridge: Educators Publishing Service, 1983.
75. Levine, M.D.: Reading Disability: Do the eyes have it? Pediatrics, 73:869, 1984.
76. Levine, M.D. and Rappaport, L.: Recurrent Abdominal Pain In Childhood: the loneliness of the long distance pediatrician. Pediatric Clinics of North America, 31:969, 1984.
77. Levine, M.D. (ed): Recurrent Pain in Children. Pediatric Clinics of North America, Vol 31, 1984.
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79. Levine, M.D., Karnisky, W., Palfrey, J., Meltzer, L., and Fenton, T.: Risk Factor Complexes In Early Adolescent Delinquents. American Journal of Diseases of Childhood, 139:50, 1985.
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81. Palfrey, J.S., Levine, M.D., Walker, D.K., and Sullivan, M.: The emergence of attention deficits in early childhood. Journal of Developmental and Behavioral Pediatrics, 6:339, 1985.
82. Levine, M.D.: Developmental Variation and Learning Disorders. Cambridge, Massachusetts: Educators Publishing Service, 1987.
83. Rappaport, L. and Levine, M.D.: The prevention of constipation: A developmental model. Ped Cl of N. Amer., 33:859, 1986.
84. Levine, M.D.: The Pediatric Examination of Educational Readiness at Middle Childhood (PEERAMID). Cambridge, Mass: Educators Publishing Service, 1985.
85. Coleman, W.L. and Levine, M.D.: Recurrent Abdominal Pain: The cost of the aches and the aches of the cost. Pediatrics in Review. 8:143, 1986.
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91. Levine, M.D.: Learning disabilities. In Wallace, H.M., Biehl, R.F., Oglesby, A.C., and Taft, L.T. (eds): Handicapped Children and Youth: A Comprehensive Community and Clinical Approach. New York: Human Sciences Press, 1987.
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Updated 11/27/02

INNOVATOR: Pediatrician Mel Levine wants to revolutionize American education by showing teachers how children think. BY BARBARA KANTROWITZ AND PAT WINGERT

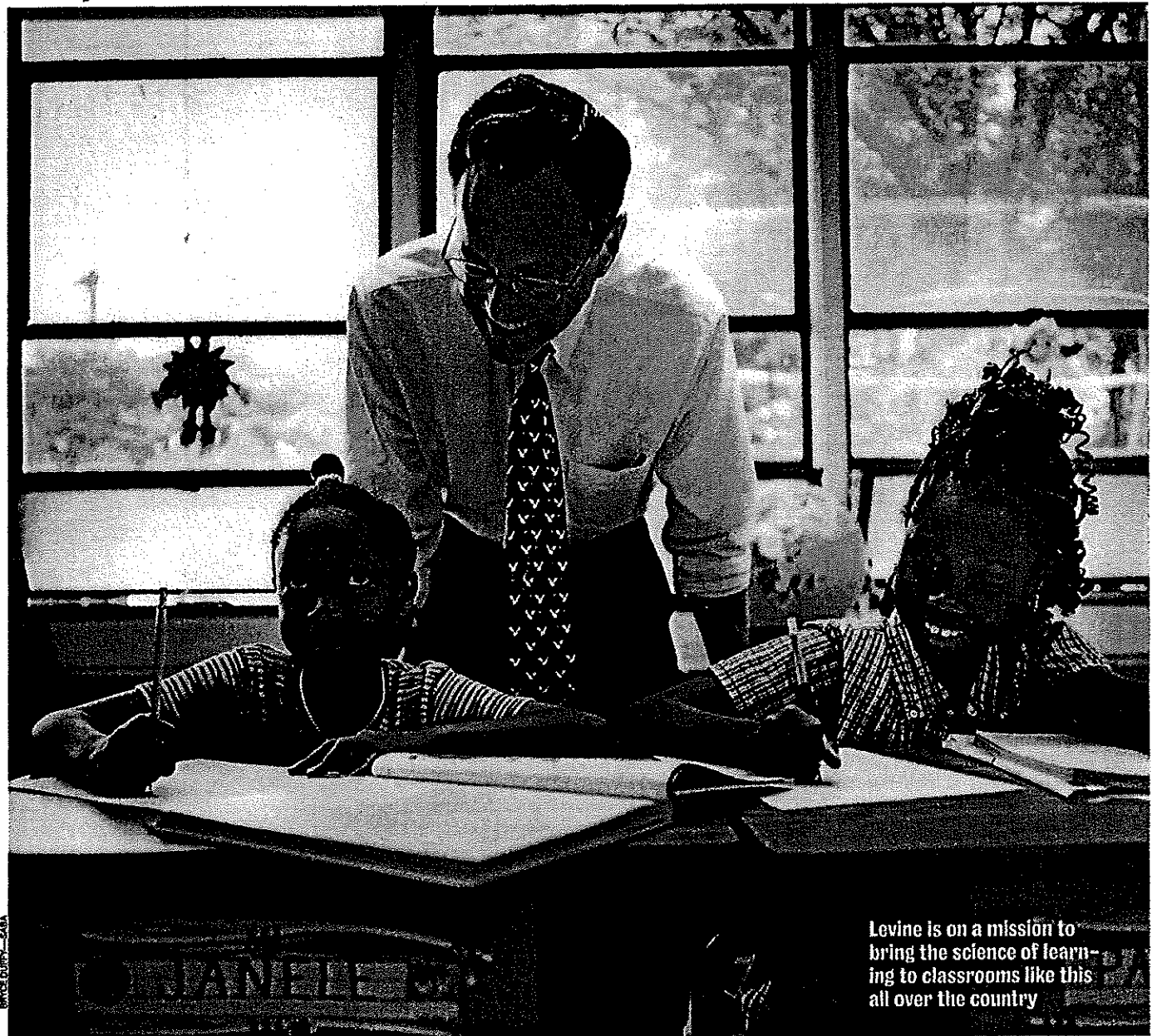
DOCTOR'S ORDERS

IF YOU SAT IN ON SHARON McGreevey's class at Menlo Park Terrace Elementary School in Woodbridge, N.J., you'd recognize a familiar set of characters from your own third-grade days. There's the boy who's always waving his hand in the air; he loves to be the first to answer questions. Then there's the quiet

girl who slinks down in her seat so she doesn't have to read aloud. There's another girl who gives long, meandering responses when she's called on and a boy who looks like he could have used a few more hours of sleep. So here's a pop quiz: which one is a typical 8-year-old?

All of the above and none of the above.

That's the basic philosophy behind the work of Dr. Mel Levine, a pediatrician at the University of North Carolina who's on a mission to revolutionize the way teachers like McGreevey look at kids. Levine says the old, one-size-fits-all approach allows too many youngsters to fall through the cracks—kids who may be perfectly intelli-



Levine is on a mission to bring the science of learning to classrooms like this all over the country

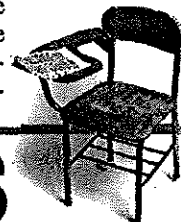
gent but struggle in school. Instead, he helps teachers understand how different children think so that they can tailor their teaching to each student. "There's a huge amount of knowledge about how learning works that hasn't gotten to the front lines, the teachers," says Levine, 60. Armed with new science about how kids' brains develop, he says a teacher can, for example, help a disorganized child remember his homework or show a socially awkward child how to work in a group.

At a time when many districts are grappling with how to rebuild their teacher ranks, a growing number of educators think Levine is pointing the way. He's already initiated thousands of teachers like Sharon McGreevey through his weeklong Schools Attuned training program, which costs \$1,200. A PBS documentary about him is in the works, as is a 22-volume video series scheduled for release this winter.

He's got two new books about learning styles coming out and a sophisticated Web site (allkindsofminds.org). And he has big money behind him. In 1999, discount broker Charles Schwab announced a five-year, \$10 million challenge grant to the institute. Schwab's backing is attracting other big donors as well. Right now most of Levine's efforts are concentrated on elementary- and middle-school children, but there's a pilot program for high-schoolers too. Although he's eager to talk about his ideas, Levine seems slightly uncomfortable in the spotlight. His small, unpretentious office near the university shows that he's clearly marching to his own drummer. Virtually every inch of wall space is filled with prints of birds (mostly geese, his particular passion); the only human image is of his wife, Bambi, who helps edit all his books, and even she is shown cuddling a cat and with a horse. At their farm about 45 minutes away

from the university, the residents include 240 geese, 40 pheasants, 19 peacocks, 10 swans, 10 donkeys, a horse and a mule.

Levine's interest in learning problems dates back to his childhood on New York's Long Island. A good student, he nonetheless felt humiliated by his lack of success at sports. It was his first exposure to the idea that no one's good at everything. He came back to the notion again and again in college at Brown, as a Rhodes scholar and at Harvard Medical School. For several years during the Vietnam War, Levine was the school doctor at Clark Air Force Base in the Philippines—an experience, he says, that really opened his eyes to the many ways kids learn. Since then his vocation has been merging the two worlds that fascinate him: medicine and education. He was running the outpatient clinic at Chil-



TEACHING APPLES AND ORANGES

According to Dr. Mel Levine, there's wide variation in how children learn and must be taught. In the example below, Jill is good at language but not at math; Liz is good at math but not at language. Jill needs verbal explanations to learn, while Liz requires a visual approach.

Jill: Learns from words

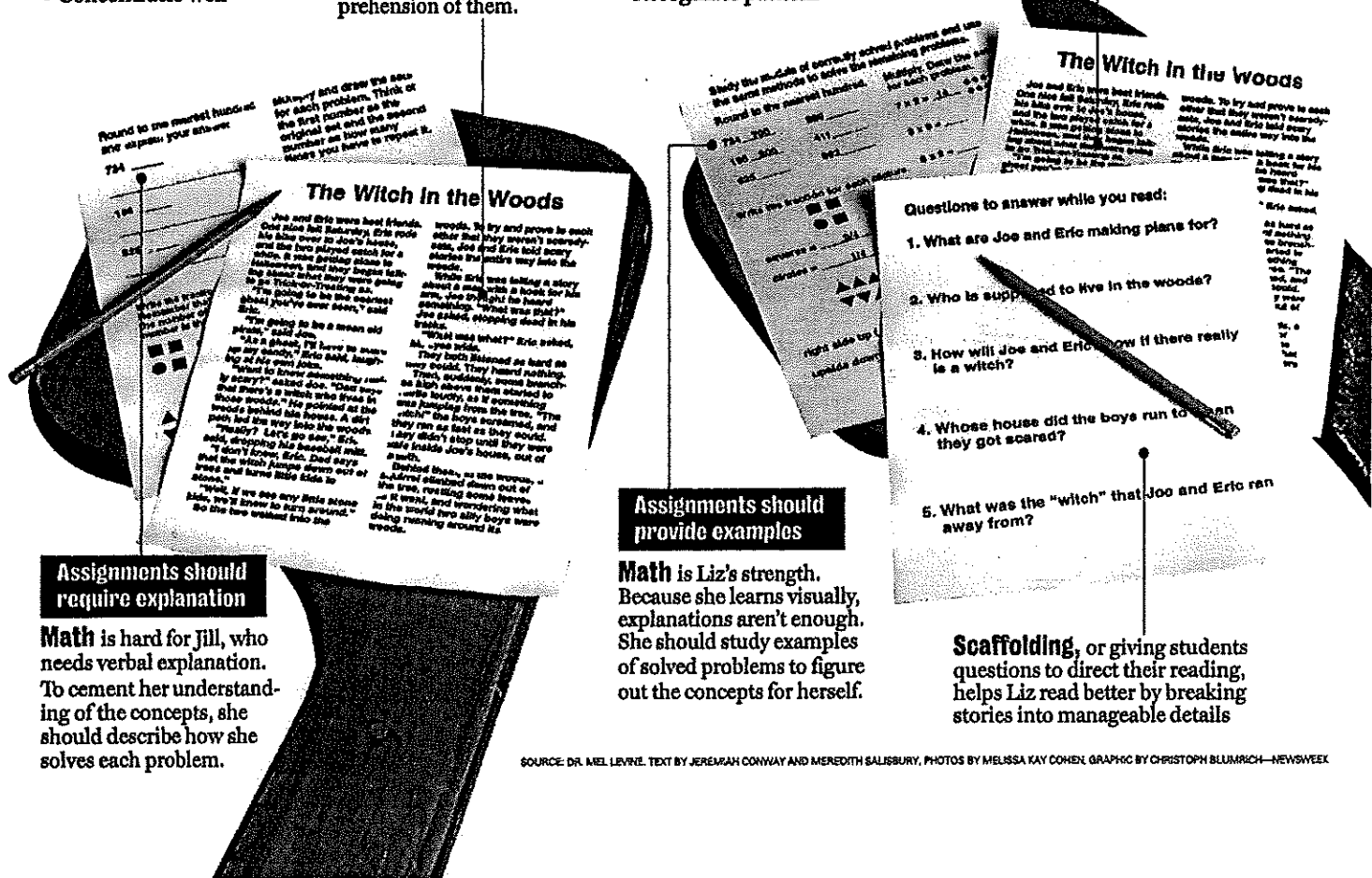
- Has good verbal skills
- Has trouble visualizing
- Uses vivid imagination
- Concentrates well

Reading comes easily to Jill. She should write her own summaries of readings to enhance her comprehension of them.

Liz: Learns from images

- Has weak verbal skills
- Prefers visualizing
- Pays attention to detail
- Recognizes patterns

Reading can overwhelm Liz. She should read with a highlighter in hand, concentrating on main points of the text.



dren's Hospital in Boston when North Carolina recruited him in the mid-'80s. In addition to his work at the university, Levine has treated hundreds of children with learning problems—many of whom he's followed for years as they make their way through school.

Levine bases his teacher training on a synthesis of all these experiences. To help teachers understand what science has discovered about the brain, he's organized current thinking about learning into eight categories that he calls "neurodevelopmental constructs," which include attention, language, memory, neuromotor function and social cognition. Within these, there are subcategories to convey the brain's complexity. These constructs interact differently in each individual brain to create unique ways of thinking, what Levine calls a "learning profile." It's a balance sheet of the child's strengths and weaknesses.

The training sessions include lectures by Levine at one of nine regional sites and workshops with people trained by him where the teachers spend a lot of their time poring over case studies of kids. They look for clues to what might be wrong. Does the child learn better by listening than reading? Does he need to sit closer to the teacher so he doesn't get distracted? The goal is to give educators the tools they need to diagnose a kid's talents and problems, just the way a pediatrician analyzes a patient. In Levine's view, the more specific the diagnosis, the more specific the remedy and the better the chances of success. "What we label are some things called 'observable phenomena,'" he says. "Teachers more than anyone else have access to observable phenomena. Schools Attuned gives you a language to talk about this."

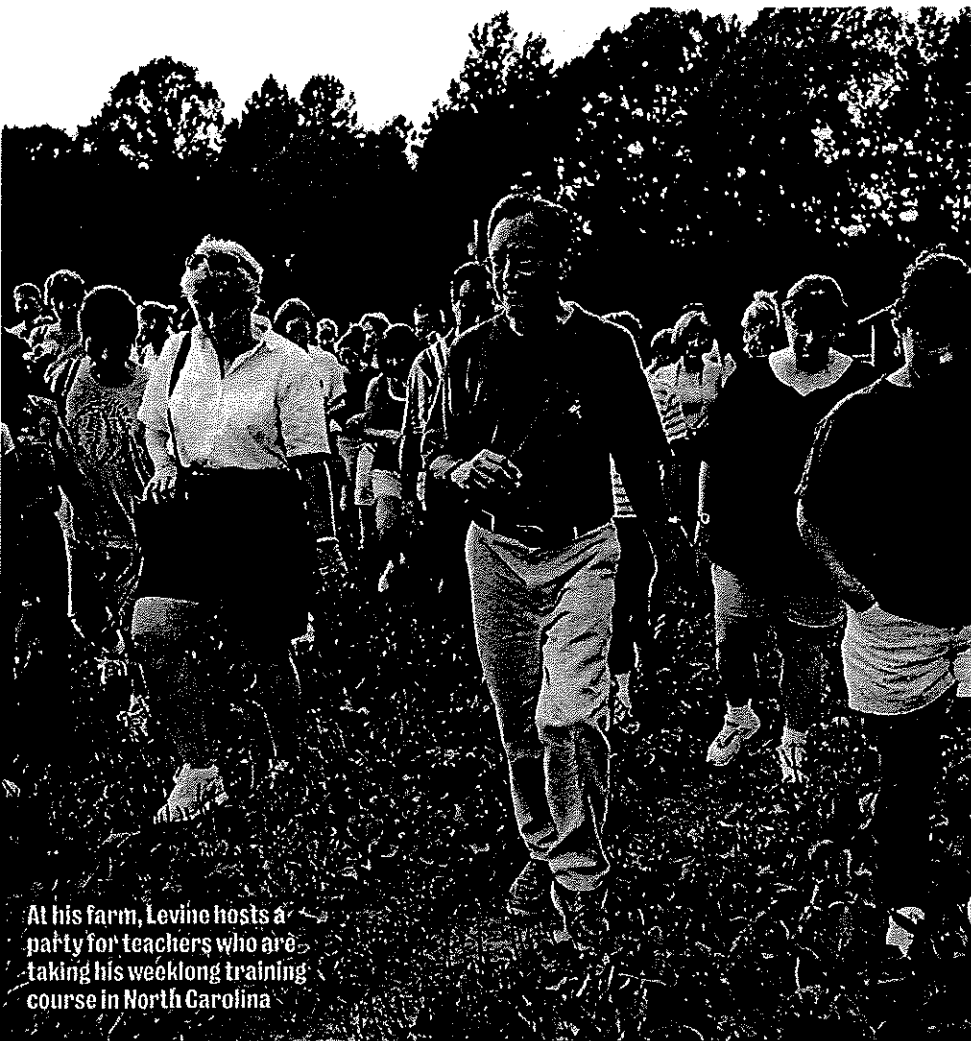
Here's how it might work. Every teacher's been puzzled by a kid who constantly looks up and down when he's copying something from the board. And even then, he'll miss part of what he should be writing down. An untrained teacher might accuse him of cheating because he's looking at another student's paper to fill in the blanks or penalize him for not completing his work. But a teacher who had taken Levine's course would recognize that the youngster had short-term memory problems. Some solutions: let him work with another kid or give him a copy of what he

needs already written down. Above all, Levine says, tell him exactly what the problem is, a process Levine calls "demystification." "The more we can impart specificity to the kid, the more they are going to be upbeat and feel in control," he says.

Many educational researchers think Levine is a provocative theoretician whose approach could be the wave of the future. "Mel is a brilliant clinician," says Dr. G. Reid Lyon, chief of the child-development and -behavior branch of the National Institute of Child Health and Human Development. "He can sit with a patient and tease apart all the things that might be influencing the youngster's development, especially in the academic areas." And, Lyon adds, "I think he's been a tremendous influence on

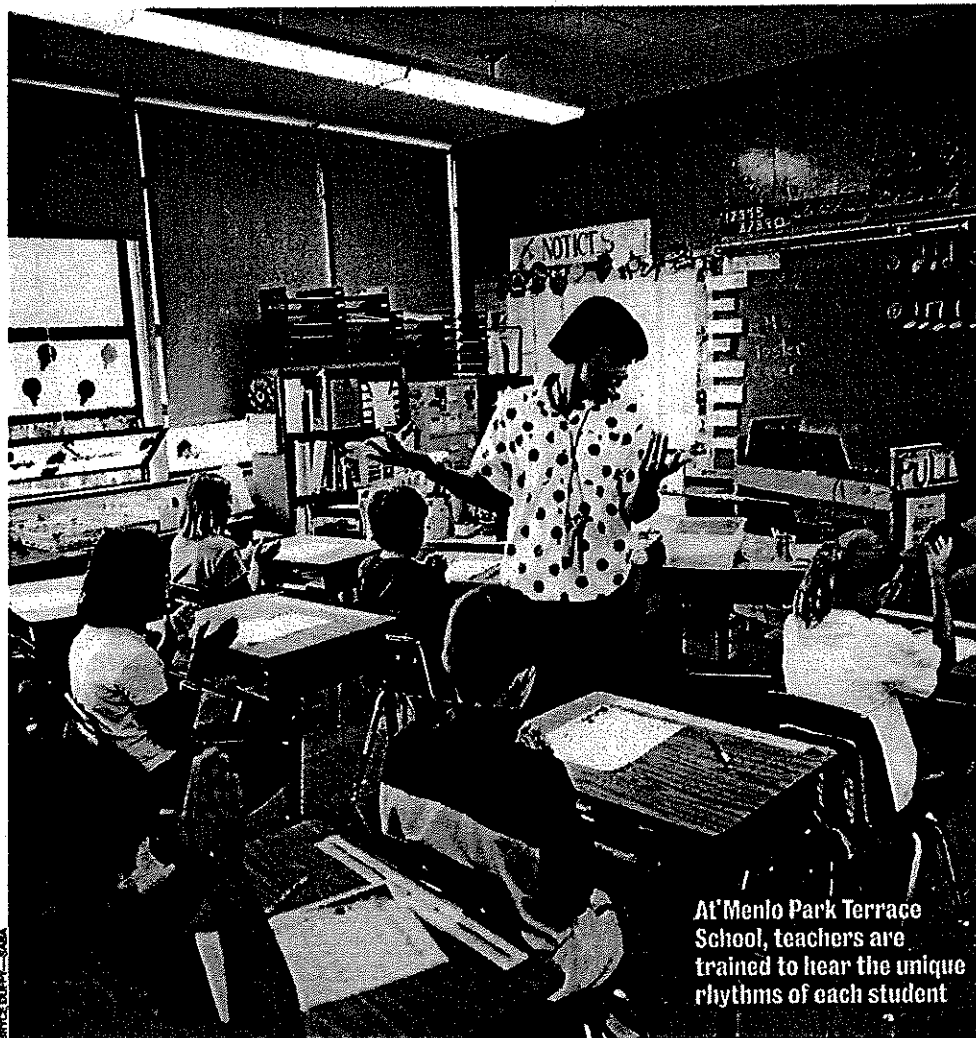
education with his message that learning is complex, and that many kids learn differently." People who train classroom teachers also say Levine represents a major shift in education. "Teachers have to become more diagnostic and prescriptive," says Art Levine (no relation), the head of Columbia University's Teachers College. "At this moment, philosophy is central to education. Equally important in the future will be biology"—how the brain works.

But his critics and even some of his fans worry that Levine may be trying to do too much too soon. They say that with all the public pressure on schools, his ideas could be embraced as the next quick fix. There is also concern that he might draw money and attention away from children with the



At his farm, Levine hosts a party for teachers who are taking his weeklong training course in North Carolina

Charismatic and unpretentious, Levine marches to his own drummer. On his farm he keeps 240 geese, 40 pheasants, 19 peacocks, 10 swans, 10 donkeys, a horse and a mule.



At Menlo Park Terrace School, teachers are trained to hear the unique rhythms of each student

His goal is to help teachers see how a student's behavior reflects the inner working of the child's mind. Everything is a clue—even the way a youngster sits at his desk during class.

most severe problems or from proven programs. "His concepts and the way they are described and presented still have to be tested for validity," cautions Lyon. "You need evidence that people should trust this stuff." Much of that evaluation is still in progress. Rita O'Sullivan, an expert on testing at the University of North Carolina, has been overseeing a three-year study of how well his approach trains teachers. The results indicate that in the first year of the study, teachers were confused by the medical jargon although they believed the information would ultimately help them do a better job. Since then, the training has been streamlined and teachers give it much higher marks. But its effect on student achievement is still untested.

No one—least of all Levine—thinks it's easy to understand the process of learning. He's just not willing to wait for a perfect system when there are so many kids who need help now. And, as schools push to raise standards, it's increasingly important to make sure no one falls behind, he says. Levine likes to think of himself as an "academic entrepreneur" and he acknowledges that he's a little bit of a maverick in his world. "Some members of the scientific community are not respectful of Mel Levine," he concedes. He knows what they might say about the way he's translated brain research for nonscientists: "Here comes Mel Levine, the scientific slob who takes big swaths, cutting and pasting a model together."

That model can seem rather daunting at first—even to experienced educators. Sharon McGreevey's principal, John Ingemi, took Levine's course in the summer of 1998. Although he admits that his head was "spinning" when he first heard the eight constructs, he was impressed with the way Levine "put everything together" and created a model that connected brain science to education. He came away determined to create a school as close as possible to Levine's ideal. With money from private foundations, he ultimately sent all 25 of his classroom teachers to Levine's training, along with the nurse and the music and gym teachers. Since he started using Levine's work, Ingemi said he and his teachers have been able to help many children in the classroom who might otherwise have been referred to remedial services.

McGreevey, a teacher for 12 years, says that when she took the course last year, it "gave me a new map." Her thick *Schools Attuned* notebook has become a kind of classroom bible that she refers to many times each week. She shares that information with her students, trying to help them understand the process of learning as they make their way through reading and math. One afternoon last week, the kids clearly identified with the case study they were reading about in Levine's book, "All Kinds of Minds." The subject was a boy named Eddie, who was popular and very creative but fidgeted when he should have focused on school. "When Eddie did sit at his desk, his body often looked all twisted up," McGreevey

read aloud. "You'd think he was trying to tie his legs in knots ... At times like this, Eddie looked like a living pretzel!"

By this time, McGreevey's room was filled with tiny contortionists as virtually every child in the class unconsciously adopted some version of Eddie's unusual posture. The class talked about how Eddie's body reflected his sometimes disorganized mind. One girl revealed that she tapped her head when she found her thoughts drifting in class. A boy boasted that he could keep his mind on several things at the same time. "I have four sets of eyes," he explained. "Two here" (touching his eyelids) "and two in here" (tapping the top of his head). Somewhere, Mel Levine was smiling. ■

BY TOM BONNELL

IT TAKES ALL KINDS OF MINDS

REVIEW OF *All Kinds of Minds*, BY MEL LEVINE, M.D.

Mel Levine, author of *All Kinds of Minds* (Simon and Schuster, 2002) does not seem, at first sight, to be a good candidate for celebrity status or the talk-show circuit. For those who have attended one of his workshops, his initially halting manner and obvious shyness make it easy to believe Levine when he says, with typical self-deprecation, that he was a "geek" during his high school years. Just a few minutes into one of his workshops, however, reveals why this pediatrician, researcher, and North Carolina goose farmer has become a best-selling author and educational superstar: the discomfort and self-consciousness soon yield to a passionate, intelligent, and thoroughly articulate physician, a prophet calling for understanding that students do come with all kinds of minds, and that good schools must find a way to help each succeed. *All Kinds of Minds* is Dr. Levine's presentation in book form.

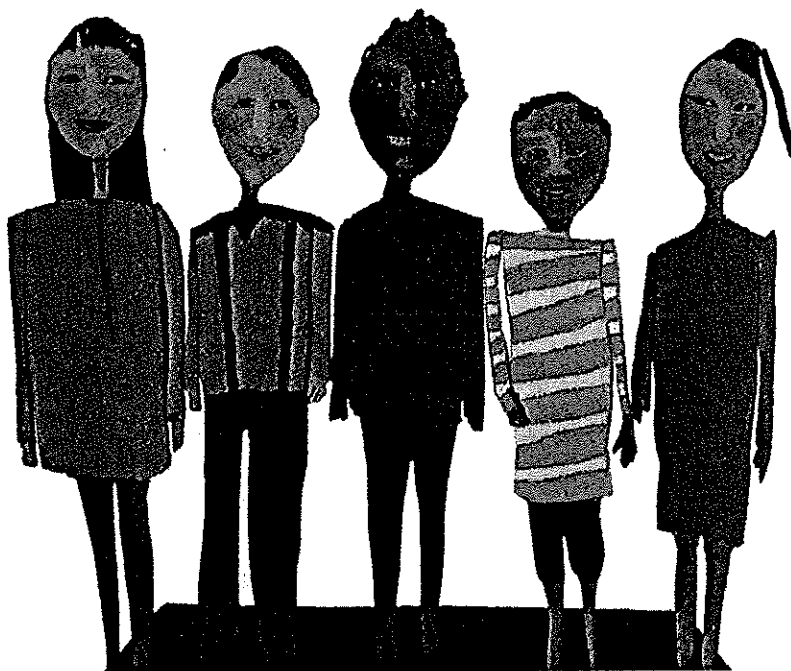
Why has his book become a national bestseller? Rather than focusing on the brain's anatomy and its neurological wiring, Levine presents the mind as teachers and parents actually see it, through what he calls the eight neurodevelopmental functions — attention control, memory, language, spatial ordering, motor, higher-order thinking, and social cognition. These functions, says Levine, constitute the brain's essential toolbox for learning: "Just as a carpenter might deploy different groups of tools to complete various projects or a dentist might use different sets of tools for different tooth tasks, our minds make use of different clusters of neurodevelopmental functions to learn

specific skills and to create particular products." Levine's guided tour of these eight areas is clear, articulate, and filled with vivid and compassionately humorous examples of how they work, and, perhaps more importantly, how these functions often dysfunction.

When students struggle in school, Levine says, it is frequently not because they lack motivation or intelligence, but because of a breakdown in one or more of these cognitive functions. "We, as well as our kids, live with our share of these flaws. Often the dysfunctions do not seriously obstruct roads to success. But sometimes they do." Along with introducing his readers to the neurodevelopmental functions and how they can go awry, Levine provides concrete strategies that can be used to help students when they do. Whether it is a student whose weak

working memory causes him to mysteriously, but constantly, lose his completed homework assignments, or the student who has lots of good ideas but tremendous difficulty getting them down on paper, Levine's strategies provide help and hope to parents and teachers alike.

In imagining his ideal school, Levine is not particularly radical. He understands that schools will continue to place their heaviest demands on the parts of a child's brain that deal with language and higher-order thinking. But Levine does insist that any school that wishes to be attuned to how students learn ("Schools Attuned" is the name of the teacher training program developed by Dr. Levine) take on responsibility for several new goals they have not traditionally assumed: training teachers to be knowledgeable in the neurodevelopmental functions, helping students



ARTVILLE

understand and learn to manage their own neurodevelopmental profiles, and creating more pathways within schools for student success.

In Levine's vision, the heart of an attuned school is teachers who are thoroughly knowledgeable about the neurodevelopmental functions: "I would like teachers to become the community's front-line experts on mind development and learning in the age group(s) they work with. Whether he or she teaches honors science, business math, freshman football, or driver's education, a teacher should be knowledgeable about the highly specific neurodevelopmental functions required for success in these realms and the differences in learning that teachers are likely to encounter among any cohort of students. The recent outpouring of research on brain function and learning should flow directly into classrooms."

While teachers should be the chief experts in the neurodevelopmental functions, Levine believes it is also the responsibility of schools to help students become cognitive experts, learning to understand and manage their own neurodevelopmental profile, capitalizing on their strengths and compensating for the weaknesses that inevitably come as part of their own standard equipment. And helping children to know their own learning profile is a lot more useful, Levine believes, than labeling them with a particular learning disorder, labels which block genuine understanding and are often one-way tickets to the local pharmacy.

Levine is perhaps most persuasive in his plea for schools to be more resourceful in the ways they help students discover their strengths and build successfully upon them, for, as he says, a student's strengths ultimately prove more important in life than his or her weaknesses. Levine also believes schools should insure that students build upon their affinities in particular subjects by having them regularly select a topic upon which "to become the 'world's leading expert' (or, at the very least, the

acknowledged authority in Mr. Bundy's sixth-grade history class at the East Plainview Middle School). The topic would be pursued for a minimum of three years, at the end of which that kid would know more about, for example, pachyderms than any member of the student body and possibly even the faculty!"

Dr. Levine's story of Bertram is illustrative of the crucial way that an attuned school and a thoughtful, caring faculty can intervene at a crucial moment to help a child succeed:

I will never forget Bertram, a lanky kid who reminded me of a creaky old ladder. He was referred to me for evaluation when applying for admission to boarding school. When I first met Bertram he suffered with prominent facial acne and was painfully reserved, making little if any eye contact with me. He was accepted at the school of his choice, but it turned out later he seemed sentenced to incarceration as a loner at his New England boarding school. Implacably stigmatized as a classic "geek" with conspicuous "dorky" features, no one was willing to be his roommate, a universal reluctance blamed on his allegedly horrible hygiene. His situation wasn't helped by the fact that his neurodevelopmental toolbox lacked some vital social thinking equipment (both verbal and behavioral), and he was unable to compete in any sport due to problems with motor sequencing. But Bertram was a whiz at a computer monitor; his flat personality would percolate when he was expounding upon the latest electronic frontiers or coming up with solutions to the aggravating impasses of information technology. However, his social isolation drove his self-esteem ever downward. It diminished steadily until Greg Collins, the school's inspired football coach, approached Bertram and asked him to become the team statistician.

Bertram took to this role as if he were born for it. He generated statistics the likes of which had never before been quantified — last quarter performance by player weight, percentage of successful point-after kicks correlated with weather conditions, and so on. At the end of each game, a throng of athletes would surround their beaming, meek-geek statistician clamoring for the latest data on their performance. Yes, Bertram

had become a statistics jock.

The basketball, soccer, and track coaches soon recruited this teenage "mathlete." He also was asked by the drama teacher to handle the lighting and audio for the school's performance of *The Music Man*. For the first time since first grade, Bertram started to feel good about himself. He began to dress better. Over Christmas, he asked his mom to take him to Abercrombie & Fitch.

She was astounded. He now felt like a product worth packaging. He visited me during those holidays, and I could barely recognize him. Bertram was gushing with anecdotes about school and lecturing me about changes he would like to see in his school's lunch program. He also described some technological advances he had initiated in the school's audio capabilities. I feigned interest but had no idea what he was talking about. All I knew was that I was sitting across from a restored ego. I had trouble containing my own high tide of excitement.

In many ways, *All Kinds of Minds* strikes a similar theme to that sounded by Howard Gardner in his work on multiple intelligences: that the great monolithic entity so long referred to as intelligence (and held responsible for a child's academic success or failure) is really not one, but many, and that schools traditionally have measured students according to very few. In Levine's comments on the function he calls "social cognition," readers will also be reminded of Daniel Goleman's concept of emotional intelligence.

Perhaps the greatest value of *All Kinds of Minds* is that it will provide for teachers of independent schools — who so frequently are better educated in their disciplines than they are in cognitive development — a common and intellectually respectable vocabulary to use in discussing their students' learning. And while some may not be able to share Dr. Levine's sanguine belief that all students really do have significant cognitive strengths, most will find in his description of neurodevelopmental functions a clear and cogent picture of the way students' minds work, and an invaluable prescription for how to help when students' minds don't work.

Tom Bonnell is the associate head and director of the middle school at The Dalton School (New York).

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A NON-PROFIT INSTITUTE FOR THE UNDERSTANDING OF DIFFERENCES IN LEARNING



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All Kinds of Minds: How it all Began - The Birth of a Notion

Dr. Mel Levine
Founder and Co-Chair, All Kinds of Minds

How can we go about helping children and adolescents find their life niches? How are we to mobilize their individual strengths and minimize their deficiencies so they may attain sufficient success and gratification? How can we prevent the dire complications of a young life marred by chronic success deprivation? How can we enable students to understand and help themselves as they contend with their personal unique patterns of mind wiring? How as well can we ensure that they are understood and appropriately managed by their parents and their teachers? How can we teach and apply all that has been learned about learning and differences in learning so as to achieve these aims?

These were the rock hard questions posed at a 1993 meeting in Chapel Hill, North Carolina. The seminar was entitled "Going to Scale" and was attended by a vigorous assemblage of national leaders, many of whom in their careers had spawned important ideas, products, and programs that they had succeeded in spreading throughout America. The Geraldine R. Dodge Foundation in Morristown, New Jersey sponsored the event in the hope that these leaders could help us have a broad positive impact on children who struggle in school.

The Foundation had supported the startup of Schools Attuned, a national program designed to help regular classroom teachers deal with the challenge of neurodevelopmental variation among their students. The approach was one in which teachers were provided with the knowledge, the skill, and the tools to observe and describe children functioning in a classroom and to derive appropriate techniques for maximizing the effectiveness of individual learners. Schools Attuned stressed a non-labeling approach to understanding and helping children with differences in learning. It included a strong emphasis on uncovering and managing strengths as well as a plan to ensure that all students are learning about learning while they are learning.

Attendees at the "Going to Scale" meeting believed fervently that Schools Attuned had undergone a successful 5-year launch around the country. They were focusing on how the program could be improved upon and applied broadly so that it might have a substantial national impact on educational practice and policy. There was also a strong interest in the ways in which the approach embodied by Schools Attuned could assist clinicians and parents in their efforts to ensure the optimum development of children.

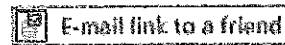
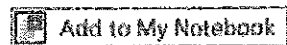
Toward the end of the historical meeting, one of the participants, Mr. Charles Schwab, suggested that we found an institute comprised of the best business minds collaborating with academic scholars in the field to take these ideas "to scale" nationally. Over the next 2 years, fueled by the energetic support of a strongly committed businessman named Randy Antic, the encouragement of the Dodge Foundation, and the tenacity of Mr. Robert LeBuhn (a member of the Dodge Board), a non-profit institute was born and named All Kinds of Minds (after a book I wrote for elementary school children). A visionary and highly talented Board of Trustees was convened. Learning difficulties in their own family members had touched many of them personally. Mr. Schwab agreed to chair the Board of Trustees, and eventually, I became its co-chair. All Kinds of Minds came into being in 1995.

Over the succeeding years All Kinds of Minds expanded and diversified. The Schools Attuned program benefited from the input of some renowned experts on professional development for teachers. Regional training sites were established throughout the United States, and the program became widely recognized as a model of effective teacher training. The Institute also initiated the Student Success Services, a technologically advanced clinical model for evaluating and following the progress of students with learning difficulties. Plans are underway to establish Student Success Services in sites around the United States. Additionally, All Kinds of Minds has worked vigorously to build public awareness of differences in learning, largely through a documentary on Public Television, entitled Misunderstood Minds, a 22-volume video library (Developing Minds), and my two recently published books, A Mind at a Time and The Myth of Laziness.

Numerous individuals have contributed to the success of All Kinds of Minds during these early years of its development. Mark Grayson became the CEO and provided remarkable energy, foresight, and brilliant skill. Mike Florio became the COO and CFO and instilled extraordinary day-to-day leadership in running this rapidly growing entity. Hosts of highly productive, knowledgeable, and innovative faculty members have continued to perfect, update, and deliver the All Kinds of Minds model and message.

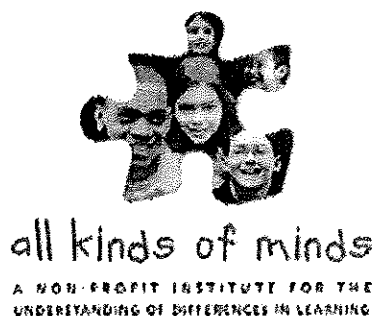
Funding for All Kinds of Minds has been nothing less than extraordinary. The Charles and Helen Schwab Foundation provided a 10 million dollar matching grant. Numerous other private foundations and philanthropists have donated generously to support the activities of the Institute. Most recently, the Oak Foundation of Geneva, Switzerland provided a 5 million dollar matching grant.

It is abundantly clear that All Kinds of Minds is having a potent constructive impact on education, on clinical practice, and on parenting. Our programs have significantly touched many thousands of people who care about and for children. And, more importantly, it has exerted its redeeming effects on even more thousands of students. We are "Going to Scale!"



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The Myth of Laziness

By Mel Levine, M.D.

Simon & Schuster, ISBN: 0-743-21367-X

The following is an excerpt from *The Myth of Laziness*, by Dr. Mel Levine.

Laziness is not an innate trait. We all are born with a drive to produce, and like saplings growing in an orchard, we have within us the resources to bear fruit, to be and to feel useful and effective. Most of our own success and that of our children is experienced and demonstrated through accomplishments, the attainments of our heads and our hands, the sum total of our school, family, and career contributions. From early in childhood on through our adult years, we want to show what we can do. We gain energy and feel good about ourselves whenever our personal output wins the approval, the acceptance, the respect of our friends, our families, our bosses (or teachers), and, most of all, our own self-critical selves. To feel fulfilled in life, it helps immeasurably if you can take pride in your work.

Some individuals somehow, somewhere lose momentum; in the pursuit of accomplishment they fail to produce; they stall out. And often they face accusations of laziness. In truth, through no fault of their own, they suffer from hidden handicaps that disrupt and interrupt their output. They are not lazy; they have output failure.

The power and the vulnerability of the drive to be productive are frequently neglected. I believe that adults and children alike feel that a large part of who they are comes from what they do, particularly what they have produced or are producing, and what they aspire to achieve in the future. Casualties result when individuals have output failure and come to believe that their work is worthless and perhaps never will be worthy. Our society pays an exorbitant price to restore their mental health, to punish them within our justice system, to deal with their underemployment, and to cope with the many other negative effects of their thwarted drives toward success.

WHEN WORK IS WORKING

On the positive side, there are countless diverse ways to savor recognition and personal satisfaction from high-quality output. Garnering rave reviews for your leading role in a musical comedy, scoring a hat trick in hockey, getting mostly A's on your term papers in religious studies, raising a well-adjusted child, and successfully replacing the gasket in a car engine are among the varied instances of output success. No one can emerge productive in all fields of endeavor, any more than any single piece of high-tech apparatus can accomplish all of the chores around the house. Each of us is destined to exhibit one or more personal forms of productivity. What matters is whether the necessary mind and body assembly lines are operating the way they should. Are you doing what must get done? Are the resulting products of sufficiently high quality? Are you generating enough output or are you putting forth a feeble trickle of inadequate stuff? In other words, is your work working?

THE EASILY AND OFTEN MISUNDERSTOOD BREAKDOWNS: OUTPUT VIRUSES

Thanks to progress in the neurosciences and related fields, we have learned a great deal about brain wiring,

including how, when, and where it operates. As a developmental-behavioral pediatrician specializing in learning differences, I have spent three decades concentrating on the varied and often subtle breakdowns within a developing brain that trip up basically bright children during their school years. In particular, I have studied the wide spectrum of dysfunctions, the very numerous discrete weaknesses that deprive so many students of success. Kids afflicted with these difficulties are the innocent victims of their own wiring. They have specific shortcomings in areas of the mind that control essential aspects of memory, language, attention, motor function, and other processes required for mastery of school subjects. The gaps in these areas are called neurodevelopmental dysfunctions. Some are inborn, some acquired. Some are mainly genetically caused; some stem principally from environmental conditions. But most dysfunctions are mysterious, of unknown origin. I have described the wide array of these heartbreaking limitations in my book "A Mind at a Time."

Many students wrestle with learning problems that are totally transparent. They manifest obvious trouble becoming good readers, mastering computations in mathematics, succeeding on scholastic aptitude tests, or surviving the social demands of the school day. But there is a substantial group with hidden miswiring, and they have been woefully neglected and misunderstood. These are individuals who struggle with output failure, a phenomenon that can decimate their productivity in school and cause some to fail in the workplace as adults.

At first glance, kids and grown-ups with output failure may seem entirely competent — so much so that they tantalize us with their abundant intellectual promise. But then that promise isn't kept. Often these individuals absorb and process information well; they learn, but they don't produce. They keep promising and intending to do things, but they seldom come through. In most instances, they can read far better than they can write, and they can interpret information but somehow can't put what they learn to productive use. It seems as if they have working disabilities; they are unable to get their minds to work! So their intake greatly exceeds their output, and they disappoint themselves even more than they disappoint others. People say glibly that they are not "living up to their potential."

THE ORIGIN OF THE TERM 'OUTPUT FAILURE'

In the early years of my clinical practice, I was struck by the sizable number of children referred to me who learned more effectively than they worked. I saw a particular concentration of such students cropping up during their middle school years — when there often is a dramatic upsurge in the demands for high output of high quality (particularly in the form of writing). These students had in common their inability to meet the intensified production demands. They became less and less successful as students. As I got to know them, I kept having flashbacks to my medical school days when we learned about "cardiac high-output failure." The following quotation from the sixteenth edition of Nelson's Textbook of Pediatrics captures the common phenomenon: "The condition, high-output failure, produces the signs and symptoms of heart failure ... when the demand for cardiac output exceeds the ability of the heart to respond. Chronic severe high-output failure may ultimately result in a decrease in myocardial [i.e., heart muscle] performance."

Perhaps because of hardening of the arteries or high blood pressure, the heart is forced to work too hard. Eventually the organ weakens. The failing heart becomes dilated, its beats increasingly feeble, so it is unable to fulfill adequately its blood-pumping role, its output job. The same cycle can pertain to a mind, one that has become ineffective — when the demands upon it keep on exceeding its output capacities. When a mind is forced to strain excessively to meet production demands, academic output failure may ensue. Incidentally, we don't call a failing heart lazy.

In 1981 I and two of my colleagues wrote an article entitled "Developmental Output Failure in School-Aged Children" for the medical journal *Pediatrics*. We described a group of students with various forms of output failure. Since then I have continued to study this too often neglected or misunderstood phenomenon.

OUTPUT FAILURE AS A WIDESPREAD PHENOMENON

Output failure is not a distinct syndrome, nor should it be understood as any sort of label or category. It is a result, not a cause. Low output occurs when one or more neurodevelopmental dysfunctions interfere with productivity. This is a very common phenomenon, examples of which include trouble writing a report or difficulty completing a project. Students who manifest output failure are a heterogeneous group. They have a mixed bag of neurodevelopmental dysfunctions and strengths. Some have serious problems getting organized.

Others find it too hard to put their thoughts into words. There are those who can't deploy their muscles in a coordinated, efficient manner. Still others lack the mental energy, the stamina needed for output. Some may experience problems remembering. But all of them face one or more high hurdles stubbornly obstructing their pathways to successful output. For the most part, their actual output barriers are seldom identified and dealt with. Instead, too many of these students stand unjustly accused of laziness or charged with some other form of moral turpitude. And they unfairly assume the blame for their reduced output.

Output failure is by no means confined to the first twenty-one years of life. The condition plagues numerous adults as well and very commonly leads to chronic career underachievement and gnawing discontent. We all know of individuals who seem competent and well meaning but whose productivity in the workplace is inadequate, perhaps even unacceptable. It may be the plumber who took forever and did a shoddy job fixing your bathtub drain, or the accountant who had to keep applying for extensions because he couldn't get to your taxes, or a coworker who triggered bitter resentment because she never accomplished her fair share of the workload. It may be the person who comes up with great ideas but never carries any of them out. A traditional military adage applies here; as the commanding officer says to his platoon, "The people who rise out of the ranks are the ones who can get the job done." Like students with output failure, the countless adults who cannot seem to get the job done deserve our understanding and our compassion. They are not intentionally turning off their spigots of output. Branding them as lazy accomplishes nothing.

"The Myth of Laziness" is intended to shed much-needed light on the phenomenon of output failure. As it explores the dysfunctions that result in output failure, this book will uncover some of the principal ingredients of successful output. Because I am a pediatrician and the bulk of my clinical experience has been confined to the five- to eighteen-year-old age group, most of what I have to say will concern productivity in school. However, I will also devote attention to some adult mechanisms and manifestations of output failure. Often the identical neurodevelopmental dysfunctions that thwart output in children can lethally affect adult productivity, too. A child may fail to do homework because she lacks mental energy. An adult with low mental energy may often be late to or absent from work because she has agonizing difficulty getting out of bed in the morning. An adolescent exhibiting problems with time management in school may be the equivalent of an adult who is always late for appointments and often running behind — perhaps without even realizing it.

Over a lifetime, the course of output failure may vary. Some individuals seem condemned to lifelong frustration with productivity. The problems they endured in school return to haunt them throughout their careers. In other cases, children with output failure become successful and remarkably productive adults in their chosen niches. Still others may develop signs of output failure as adolescents or as adults despite having created their share of praiseworthy products at an earlier time of life. As the demands on them change, as people themselves change, as their environments change, their output can change — for better or for worse.

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Getting at Getting it: The Quest for Comprehension

By Dr. Mel Levine

It is common to watch closely the extent to which students are acquiring basic skills in reading, mathematics, and writing, but equally compelling and often neglected is the question of whether students are really understanding what they are expected to be learning. Deficits of comprehension are common and often very subtle. They have the potential to make school uninteresting and intimidating for many students.

There are multiple targets for understanding in education. Kids need to grasp ideas, issues, concepts, rules, processes, and even skills (it is possible, after all, to apply a skill without really understanding it). Different students reveal different levels of comprehension. Some may have only a minimal understanding of the ideas under consideration in a social studies class, while others can analyze and see their implications with relative ease. Children who are deficient in their understanding may become bored and inattentive during class or they may simply over-rely on memory and try to store and regurgitate material they've never really been able to interpret. That sometimes works, but it's hardly a satisfying way to become educated!

Some students reveal weak comprehension monitoring; they don't understand whether or not they understand. They may think (or want to think) they comprehend some ideas but, in reality, their understanding is superficial or even non-existent.

There are many possible reasons why a child may reveal a comprehension deficit in school. First and most common are various weaknesses of language processing. Two forms are especially frequent. First many students have semantic deficiencies; they have a superficial handle on word meanings. The words they know they know only vaguely, unaware of their connections to other words, their shades of meanings, their broad implications and applications. As kids progress through school, there is a never-ending tidal wave of vocabulary that is often decontextualized (removed from the experience of every day life). There is also a proliferation of technical vocabulary, words like hypotenuse, refraction, and nepotism. These are terms your mom never utters at breakfast, and they can seriously threaten the learning of kids with semantic gaps. Other students endure language problems at the sentence level; syntax or word order doesn't register or ring meaningful bells for them. As a result, they are apt to have trouble following directions, interpreting verbal explanations, and understanding what they read. Sentence comprehension problems are especially common during the elementary school years, and some victims seem to develop attention deficits that are caused by their lack of comprehension. Why keep listening when you can't understand?

Some students are plagued by nonverbal comprehension gaps. They have problems visualizing phenomena. It may be hard for them to grapple with the distinction between a rectangle and a parallelogram because they are weak at discerning such spatial differences. They may also have trouble understanding the rotation of planets, the flow of blood through the human circulatory system, and the geographic locations of specific Asian countries. In other words information that requires enhancement without heavy reliance on language may elude such students.

Many kids have trouble forming concepts. Concepts are groups of features that go together and are known collectively by a particular term. The concept of civil rights contains a cluster of identifying features. So do the concepts of acceleration, evaporation, vegetation, and reforestation. Students suffer in their understanding when they are unable to identify the critical features that make up a concept. It is then hard for them to know what is really meant by Liberalism or perimeter when they meet up with such words in a textbook or during a class discussion. They are likely to have trouble citing examples of these concepts and describing how they get applied.

Sometimes memory weaknesses can thwart comprehension. Understanding new information depends in part on attaching it to what you already know. There are students who have limited access to their prior knowledge, so it becomes hard for them to make immediate sense of new inputs. Other students can't hold new information in short-term memory, especially if it arrives at a rapid rate or in extra large chunks. They become disoriented when such information flows and may experience frustration in trying to comply with oral directions, copy from the board, take notes, or comprehend the basic ideas contained in a lecture.

Problems with comprehension are especially common in high school and college. A teenager may insist she "doesn't get" physics or chemistry or political science. Unfortunately few students know much about what understanding entails. They are unaware of the forms of understanding I have mentioned in this essay. This is particularly problematic for students who have trouble understanding, especially those who don't really understand that they're having trouble understanding (that's most of them, I think)! Early in a child's education, we need to be emphasizing the understanding of understanding, fostering what is called "metacognition" in every student. By thinking about thinking while they are thinking, kids can gauge whether or not they understand. They can learn about their own preferred pathways of comprehension. They can figure out how best to represent new information in their minds. Should it be a picture, a verbal description, a diagram, a formula, an example, etc.?

Misunderstanding students are too often misunderstood. We need to be able to identify partial graspers, help them understand themselves, and develop with them the tools they will need to be able to comprehend.

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Chelsea

Chelsea is an eleven-year-old who is entering the sixth grade. She looks forward to "starting over" with new teachers and classes. Chelsea is known for her song writing and acting talents. During the summer, she directs and leads her neighborhood friends in plays that she creates. She has recently become fascinated with fashion and has spent hours creating elaborate costumes for her productions. She loves to sing and act and has been chosen for numerous solos in school concerts and plays. She also organizes the productions, designs and paints sets, and orchestrates ticket sales with her friends. On the stage, she is outspoken and confident, however, she displays a different role in the classroom.

Chelsea is well respected by adults and peers because of her positive attitude towards everything and everyone. She never passes up an opportunity to help her classmates, neighbors, teachers, and family. It is very seldom that anyone sees Chelsea without a smile and a kind word. She is an extremely talented "actress" because those smiles and acts of kindness mask the internal battle she constantly fights. Chelsea struggles in all subjects when she is faced with text. Science and math offer her "roller coaster" days. Although the textbooks are confusing to her, Chelsea loves doing science experiments and working with math manipulatives. Her "ups and downs" in math and science also derail her performance in language arts class. She is a great speller, has neat handwriting, and loves telling stories she creates, however, she avoids class discussions and writing assignments. Her responses are short and non-elaborative. She finds long explanations and directions complicated and confusing. Although Chelsea is a strong oral reader, she is unable to find main ideas and struggles with summarizing and making inferences. To compensate for these difficulties, she concentrates on what is being said and tries to connect new information to her personal experiences.

Along with Chelsea, her parents and teachers are concerned about the academic challenges that lie ahead in the upcoming years. They are proud of Chelsea's efforts, but want to help her avoid losing her positive attitude toward school.

Strengths:

- Has singing and dramatic talents
- Is creative and artistic (writing songs and plays, designing costumes and sets)
- Is well-respected
- Is helpful and kind
- Has a positive attitude
- Is a great speller
- Shows strong organizational skills
- Has neat handwriting
- Is a good storyteller
- Is a strong oral reader/decoder
- Uses personal experience to learn new information

Affinities:

- Fashion and costume design
- Singing and acting
- Science labs
- Math manipulatives
- Storytelling
- Designing and painting sets

Areas in Need of Improvement:

- Difficulty understanding text she reads
- Avoids class discussions and writing tasks
- Finds explanations and directions complicated and confusing
- Gives short, non-elaborative responses orally and written
- Unable to find main ideas
- Struggles with summarizing and making inferences

Possible Management Plan:

The first step in management is a discussion with Chelsea about the reasons behind some of her difficulties in understanding, and the resulting academic struggles. It is important to make Chelsea aware of her strengths and areas in need of improvement, as well as to instill a sense of optimism for improvement. Development of a management plan may include a balance of accommodations and interventions, as well as an integration of Chelsea's strengths and affinities.

Chelsea needs help with reading comprehension on the sentence level where the syntax or word order doesn't register meaning. She also needs help understanding the literate language used in the classroom and in textbooks and determining important information.

Leveraging Strengths and Affinities:

- Provide Chelsea with reading materials that tap into her love of fashion and drama (e.g., fashion magazines and plays). Give Chelsea the assignment of creating her own questions.
- Use song lyrics to teach main idea, summarization, and inference skills.

Accommodations and Interventions:

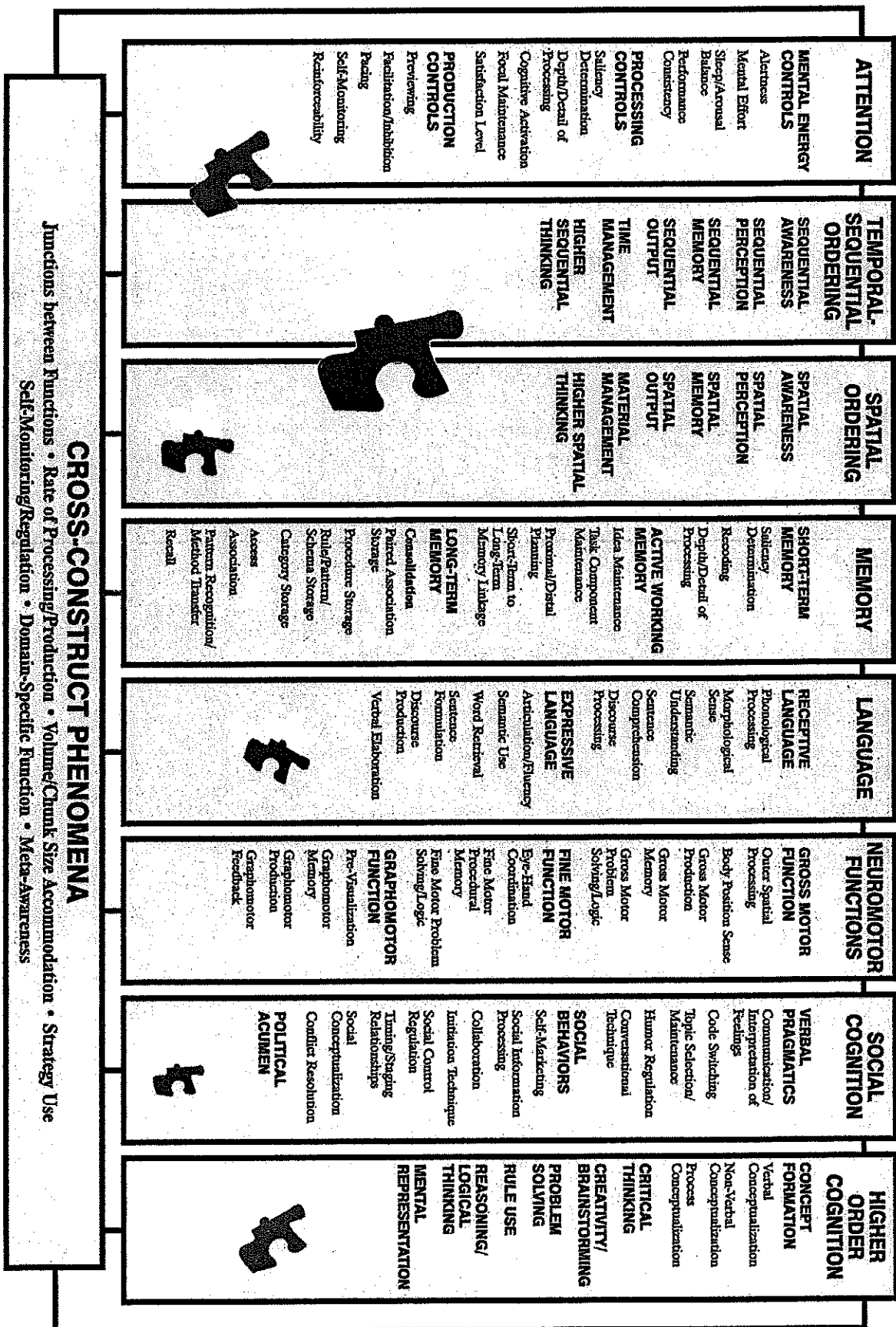
- Preview, repeat, and summarize important points. Give advanced warning when an important piece of information is about to be presented.
- Use tape recorders to record lessons and class discussions. Create a cassette library of taped lessons and discussions for students to check out.
- Use summary charts and tables to reinforce her understanding of complex concepts, ideas, and activities.
- Allow Chelsea to highlight important information in textbooks.
- Provide partially completed pacing guides to denote important information while reading. Gradually reduce the amount of information provided on the guide.

Read more about strategies for Understanding Ideas

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A Table of Neurodevelopmental Constructs



Compiled by Dr. Mel Levine, MD, FAAP, Martha Reed, MEd, and Ann Hobbgood, MEd, from The Clinical Center for the Study of Development and Learning, a University-Affiliated Program at the University of North Carolina, Chapel Hill, and ALL KINDS OF MINDS, a nonprofit institute for the Study of Differences in Learning.
Website: www.allkindsofminds.org Copyright © 2000 by Mel Levine, MD, FAAP ISBN 0-698-1898-3

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Neurodevelopmental Themes Over Time: Some Evolving School-Related Expectations

Side B

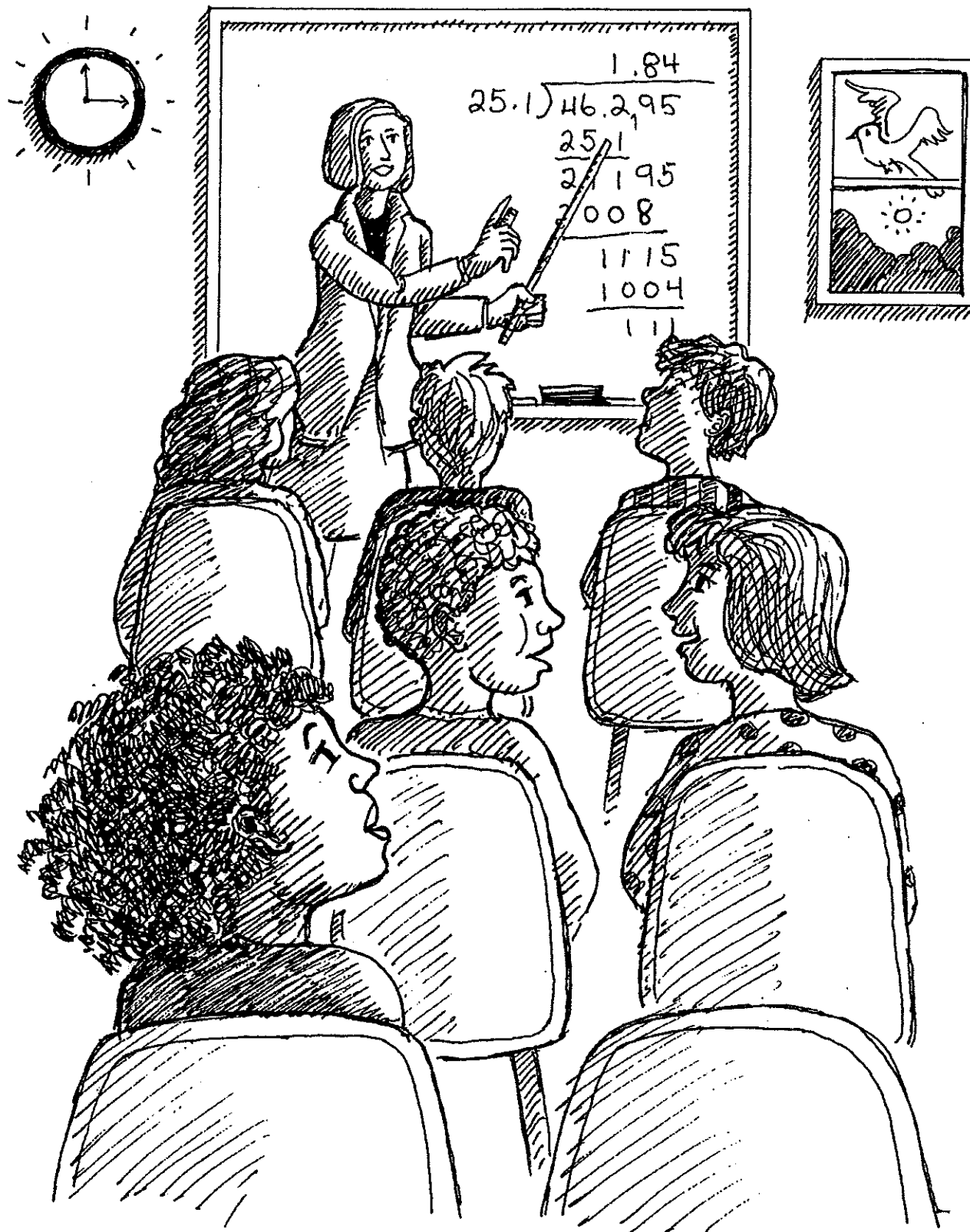
NEURO-DEVELOPMENTAL CONSTRUCTS	REGULATION		ORGANIZATION		PRESERVATION		INTERPRETATION AND IMPLEMENTATION		SOPHISTICATION	
	Attention	Temporal-Sequential Ordering	Spatial Ordering	Memory	Language	Neuromotor Functions	Social Cognition	Higher-Order Cognition		
Preschool and Kindergarten through Grade One	• Need for activity modulation • Demand for concentration in group settings • Call for delays of gratification • Requirement to conform to routines • Need for bottom-up processing (as in reading) • Demand for attention to detail	• Need to assimilate basic time and sequence concepts/time vocabulary • Exposure to multistep instructional inputs • Initial ordering of alphabetic, numerical, and phonological notation • Learning musical rhythms	• Demand for visual discriminatory abilities (e.g., shape and symbol distinctions) • Stress on visual-motor integration • Requirement for appreciation of visual boundaries (lines on paper spaces between words)	• Call for deliberate paired associate learning (e.g., grapheme/phoneme) • Introduction of abstract, symbolic visual memory • Frequent use of episodic memory	• Expectation of vocabulary growth spurt • Need accurate articulation, intelligibility • Call for keen phonological awareness and manipulation • Demand for literate (non-colloquial) language use and comprehension • Introduction of specialized vocabulary	• Stress on eye-hand coordination and fine motor praxis • Initial awareness of gross motor efficacy • Requirement for controlled fine motor stabilization (e.g., pencil grip, scissors) • Need for non-visual finger localization functions	• Need to emerge from parallel play • Compliance with adult supervision in play • Initial challenge of sharing and conflict resolution • Beginning differentiation of peer and adult interaction rules	• Strong reliance on sensory data and perception • Need for empirical discovery (awareness) of concepts • Initial encounters with abstract symbols • Experience with trial and error hypotheses • Classification skills		
Grades One through Three	• Greater demand for sustained concentration • Need for enhanced filtration of distraction • Initial stress on reflection, task planning and self-monitoring • Call for persistence and task completion • Need for top-down information processing in addition to bottom-up (as in reading) • Stress on consistency control	• Need for phonemic segmentation and resynthesis • Stress on serial order recognition recall in spelling • Stress on practical sequences (e.g., days of the week) • Demand for mastery of math algorithms	• Stress on spatial planning in writing • Call for gestalt appreciation (for spelling, sight vocabulary) • Need for visual pattern recognition for reading, decoding, and spelling • Importance of focus on visual detail	• Stress on convergent single-item recall (math facts, sight words) • Experience with rote learning • Differentiation of abilities by format • Need for procedural, sequential recall in math, spelling, handwriting • Demand on storage and recall of multiple directions	• Demand for phonological memory and segmentation for spelling and reading decoding • Growing need to appreciate syntax and morphology • Initial integration of language in writing • Need to decipher word problems • Growing formal awareness of language rules	• Stress on motor memory and accuracy for symbol formation • Initial peer comparisons of athletic prowess • Stress on visual perceptual motor integration (e.g., copying) • Need for planning simple motor sequences • Call for cursive/connected writing	• Need to appreciate perspectives of others • Requirements of recognizing two-way nature of relationships • Demand for reciprocity (giving and taking) • Expanded use of verbal pragmatics	• Use of experiential knowledge for reading comprehension • Assimilation and confirmation of rules (as in spelling) • Overriding of sensory data with logic • Brainstorming demands • Emergence of rule learning and application • Understanding of place values, re-grouping in math		
Grades Four through Eight	• Explosion of decontextualized detail • Less predictable information flow • Growing social distraction • Need for attention in low interest contexts • Stress on extended mental effort • Demand for planning and self-regulation • Reemergence of importance of bottom-up processing of information	• Demand for narrative organization in writing • Use of extended causal/temporal/procedural chains • Appreciation of temporal relationships for content area subjects, i.e., social studies • Need for staging tasks • Demand for prioritizing and schedule planning • Use of stepwise work/problem solving	• Need for rapid visualization for writing and spelling • Growing need for geometric imaging • Demand for material/"prop" organization • Need to perceive/concrete part-whole relations in math • Demand for visual-graphic interpretation and diagramming • Use of visual images to comprehend and store information • Call for designing and using computer graphics	• Demand for rapid simultaneous recall • Need for active working memory • Stress on automatized recall of facts and procedures (as in mathematics) • Call for mnemonic strategies • Demand for self-testing • Need for rapid rule recall • Demand for highly convergent activation of prior knowledge	• Stress on comprehension in reading • Need for narrative skill (oral/written) • Call for verbal fluency to communicate knowledge, orally and in writing • Stress on technical vocabulary • Explosion of decontextualized language • Requirement for expository comprehension and writing • Call for second language learning	• Intensified motor competitiveness • Convergence of body image and motor skills • Requirement for graphomotor fluency and automatization, synchronization • Need for rapid copying skills • Requirement for keyboarding skill • Demand for gross motor synchronization in sports	• Quest for intimacy in friendship • Need for conscious reputation building • Emergence of varying degrees of friendship • Emphasis on conforming and normality • Focus on lingo use • Stress on affective matching • Call for collaboration	• Emergence of preferred modes of thought • Stress on abstract concepts • Call for flexible rule application and generalization • Need for conscious problem-solving methods • Critical thinking demands • Proportional/propositional reasoning needs		
Grades Nine through Twelve	• Multiple degrees of saliency in information • Heightened attention/memory and attention/language interactions • Growing affective distraction • Increased potential for mental fatigue • Stress on previewing, pacing, and self-monitoring • Flexibility of bottom-up/top-down processing	• Demand for sequential solution of geometric proofs • Call for effective reconstruction of sequences • Heightened stress on time management • Increased need for logical step-wise reasoning/production • Appreciation of historical perspectives • Need to master computer sequences	• Growing call for non-verbal reasoning with spatial concepts • Opportunities to use visualizing strategies, graphic representations of knowledge • Need for detailed appreciation of visual patterns and formats • Increased nonverbal thinking in science and math	• Expectation for meta-memory sophistication • Stress on cumulative recall • Demand for summarization ability • Differentiation of memory ability by content • Surge in volume of content to be stored and recalled • Need for recognition of patterns in varied contexts • Recall of computer systems and keyboard	• Demands for keen metalinguistics and comprehensions monitoring • Growing stress on abstract, figurative language • Stress on linguistic-ideal density in texts • Increasing use of writing language • Word processing skill	• Specialization of gross motor skills • Lessened academic stress on fine motor dexterity • Call for speed writing, note taking and keyboarding • Opportunities for artistic, craft, musical motor talent displays	• Greater tolerance for diversity • High-profile interactions with opposite gender • Increased perspective-taking during reading, listening, and writing • Need to control responses to peer pressure • Demand for political acumen in teacher and peer interactions	• Use of third-order analogies • Need for multiple alternative solutions for problem-solving • Reconciliation of knowledge from multiple sources • Need to deal with abstract concepts within abstract concepts • Call for hypothesis generation • Importance of evaluative skills		

The background of the page is a dark, textured collage. It features several stylized, light-colored eyes and hands. Some eyes are looking directly forward, while others are looking to the side. The hands are shown in various poses, some with fingers spread. The overall style is graphic and somewhat surreal.

Topic 2: Attention

Paying Attention

Topic 2: Attention





Introduction

Every second of your life there are so many things you could be thinking or doing. It's your **attention** that helps pick out the most important things for you to concentrate on. Attention can help or hurt the way you learn and how hard you can work in school. In fact, paying attention is sometimes called **concentration**.

Sometimes, Paying Attention Is Like Watching TV

When you sit in a classroom, you can watch the teacher, your friends, the chalkboard, or the tree outside the window. You can listen to the teacher, the clock ticking, the noise from the corridor, or the ventilation system. You can be thinking about what your teacher is saying, about what you're going to do after school, or about the clothing that the kid next to you is wearing. There are so many things going on around you. How do you know what to pay attention to when you're learning?

In some ways, using attention in school is like watching television. To see a show you want to watch on TV, you have to tune in to the right channel at the right time. Not only that, you have to concentrate for the right amount of time, or you might not understand the plot of the show.

In school, you need to pay attention to what the teacher wants you to learn. Sometimes you may be able to listen and understand without too much trouble. But at other times, your mind may have to work hard to concentrate on important details, like the plus or minus signs in a math problem. It's really a matter of how you divide up your attention and when you concentrate on different details of a problem. When your attention is working properly, your mind is like a television set turned to the channel showing your favorite show.

Choosing the most important thing to concentrate on at the right time and filtering out the unimportant things are two ways attention helps you in school. But there are other kinds of attention that are just as important.



All Kinds of Minds

In the book, *All Kinds of Minds*, Eddie is a boy who has problems with his attention. Eddie is a great kid; he is fun and he has a lot of great ideas. But Eddie definitely has trouble concentrating. His mind gets distracted, and takes too many "mind trips." Also, Eddie keeps getting into trouble because he does things too quickly, without thinking or planning enough.

It Helps to Plan Ahead

When you have a project to work on, whether it's writing a report, solving math problems, or making a sculpture from clay, it helps to make a plan before you start. **Planning** can help your mind predict what a report will say before you write it, or estimate the outcome of a math problem before you start working on it. If you don't think your plan is going to work, you can think up another plan. In fact, you can keep planning different ways of doing your project until you come up with the plan you think will work best.

Planning usually works pretty well, but it takes time. When you're in a hurry, you may not take the time to think or plan ahead. Instead, you might be **impulsive**. An **impulse** is a feeling you get that makes you do something without thinking or planning. For instance, you might have the impulse to say something mean to someone without thinking about how your words might hurt that person. Or you might guess at a question on a test before taking the time to think about the possible answers. If you are impulsive, you sometimes act too quickly, without taking the time to make a plan. By slowing down and paying attention to planning, you can control your impulses. When you gain control of your impulses, you will do better in school.

Take the Time to Pay Attention!

It's important to pay attention to how fast or slow you're working. You're much more likely to get the right answer or do the best job when you take the time to pay attention to your work. Unfortunately, paying attention to plans and watching for errors in your work takes time. If you don't pay attention to how well you're working, you might work much faster, but you will make more mistakes.

Working at the right speed—not too quickly and not too slowly—plays a big part in attention. It takes time to concentrate, and it takes concentration to do things at the right speed!

Monitor Your Work

Sometimes, you even need to go back and pay attention to what you've finished! This is called **self-monitoring**, and it can be one of the hardest jobs of all.

A **monitor** is someone who makes sure things are done right and who reports back when something has gone wrong. In the same way, there are "monitors" in your brain that check what you've done so you can make corrections or changes if you have to. Before you hand in your spelling, for example, a monitor inside your head might go over the words to make sure they look right. After you do your math, your brain acts as a monitor to check your answers.



Stay Awake and Alert

Have you ever noticed how hard it is to pay attention in class when you're tired? Your attention works best when you're awake and alert. There are parts of your brain that actually control how awake and alert you are in school. Bundles of nerves in your brainstem turn down your attention at night so you can fall asleep, and then turn it up again in the morning so you can be alert during the day.

Getting a good night's sleep can help you be more tuned in during class each day. If you feel tired in class, you have to work hard to stay alert. Sometimes taking notes, repeating what the teacher is saying under your breath, or asking the teacher if you can get up from your desk can help.

Control Your Moods

If you are too happy or unhappy about something, it can be almost impossible to pay attention in school. When your moods or feelings bounce around too much, when you keep going from very happy to very sad, it's hard to pay attention. Controlling your moods can help you pay attention in school.

Control Your Body

If you're on the go all the time, if you can't slow down, how can you pay attention? You know what it's like to take a picture when you keep moving the camera—the photo comes out all blurry. Even a video camera has to move at the right speed for the tape to come out looking sharp. If your mind can't keep up with your body, you need to start thinking about ways to control your physical activity.

When You Have Trouble Paying Attention

Everyone has trouble paying attention sometimes. Most people can pay attention best to things that are fun and interesting. It takes more work to pay attention to things that are boring. But when students have a lot of trouble with their attention, we say they have **attention deficits**. They are often very smart, interesting people, but their problems with attention may result in some problems in school. ▼

When kids have problems with attention . . .

- they get distracted easily
- they get tired and bored when they try to pay attention (especially when working on things that aren't fun)
- they have trouble finishing their work
- they work too quickly without thinking
- they may move around a great deal and have trouble sitting quietly; some people say they're hyperactive
- they don't notice when they're making mistakes, or when they're doing or saying something wrong