

## Brain Gym® (educational kinesiology)

Carroll, Robert. (2009) Brain Gym (educational kinesiology). Retrieved October 20, 2010 from <http://www.skeptdic.com/braingym.html>.

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*Brain Gym® ... builds, enhances or restores natural neural pathways in the body and brain to assist natural learning.*--unsubstantiated claim from a Brain Gym flyer

Brain Gym is a set of movement activities such as "crawling, drawing, tracing symbols in the air, yawning, and drinking water" ([Hyatt 2007](#)) that, according to the [Brain Gym website](#), are said to help children, adults, and seniors to:

- Learn ANYTHING faster and more easily
- Perform better at sports
- Be more focused and organized
- Start and finish projects with ease
- Overcome learning challenges
- Reach new levels of excellence

The basic idea behind Brain Gym is that the brain will develop, and learning will be enhanced, by certain bodily movements.

Brain Gym was created in the 1970's by Dr. Paul Dennison and Gail E. Dennison, who "were seeking more effective ways to help children and adults who had been identified as 'learning disabled.' They drew from a large body of research by developmental specialists who had been experimenting with using physical movement to enhance learning ability." They called their work "Educational Kinesiology." Paul worked with chiropractor [Richard Tyler](#),\* a friend of Arnold Schwarzenegger's and a proponent of "[alternative chiropractic](#)." For many people knowledgeable of [chiropractic](#), this association is a red flag. It gets worse, though. The following is from the Brain Gym [website](#):

[Applied Kinesiology](#) (AK) is a distinct work used by chiropractors, similar to Edu-K in its study of muscles and use of muscle-checking or muscle-testing, and yet different from Edu-K. AK is based on processes of "muscle-testing" that isolate the response of individual muscles in the body. Edu-K is oriented to goals, and to daily life function and performance, rather than to a medical or mechanistic model of the body. AK includes a set of specific tests and related corrections to restore balance in a therapeutic model, and uses test responses to make an evaluation of physiological health. One-to-one

correspondence is frequently used between muscle “weakness” and organ or system function. The chiropractor corrects imbalances using spinal or other muscular, cranial, or lymphatic manipulation and/or by offering nutritional support.

AK is not the kind of activity you want to associate yourself with if you are claiming to be on the leading edge of science. Its practitioners refuse to recognize that their tests are best explained by [ideomotor response](#) and have rejected double-blind randomized tests of their work because the tests consistently show AK does not work. That the founders of Brain Gym align themselves with a pseudoscience does not bode well. In fact, however, it is a sign of what is in store for those who delve into the nature of this "worldwide network dedicated to enhancing living and learning through the science of movement."\*

Fortunately for the Dennisons, they were able to market their product as a new approach to learning, "learning through movement." The Brain Gym website says that the program is being used in 80 countries. Dr. Dennison's books and manuals have been translated into 40 languages.

Unfortunately, the research they drew on has been widely discredited (Bruer 2004; Hyatt 2007; [Novella 1996](#)) and the follow-up research on the program itself is laughably inadequate. There have been only a few published studies on Brain Gym. One involved four participants, one of whom was the author of the study. Three were published in a journal that requires the authors to pay for publication. Another study has serious methodological flaws:

the research reported in the article was conducted with elementary school students and then extrapolated to university students. The intervention consisted of students in the target school listening to Mozart during the day and participating in activities based on Brain Gym®, while students in the comparison group participated in their usual activities during the school year. The author concluded that the intervention was successful; however, comparisons were made using only teacher ratings of students in the target school and percentages of increase in mean scores on academic tests, with no determination of whether the differences between the groups were statistically significant. The researcher did not control for threats to validity or address issues related to reliability of measures or to treatment fidelity. The article concluded with a recommendation that university students use Brain Gym® type exercises before an examination to improve test performance but provided no credible research support for that recommendation. (Hyatt 2007).

Despite what we've heard about [publication bias](#) (that negative studies don't get published), a [dissertation](#) was published in 2001 on Brain Gym and found no significant difference between the students doing the Brian Gym exercises and the control group.

Brain Gym® International, founded in 1987, is owned by The Educational Kinesiology Foundation, which is located in Ventura, California. Their website posts a [21-page paper](#) touting the research that has been done to support the program. Most of the studies cited that are called "academic papers" have been published in Brain Gym's own journal. None appear to have been replicated. Copies of some of the studies are available from Brain Gym for \$25 each. One of the studies is a review of neuroscientific literature. One concerns ADHD and drugs such as Ritalin. Another deals with [NLP](#) and the brain. One is called "Movement or medication? The alleviation of ADD."

Another article was published in *Perceptual and Motor Skills* and claims to have found that university students trained in "Dennison Laterality Repatterning" and Brain Gym had better response times to a visual stimulus than those who did only Brain Gym exercises. Both of those groups responded more quickly than a control group did to a visual stimulus. The abstract posted on the Brain Gym page does not note how many students were involved or what the specifics of the training were, nor did the abstract note if the differences were statistically significant. More important, no indication is given that such activities affect learning in any meaningful way.

Several of the studies posted in the Brain Gym paper concern work with learning-disabled students and such things as "static balance." It may well be the case that some of the exercises are useful for developing better balance, but there is no evidence that these activities repattern any part of the brain. In fact, none of the abstracts say anything about how the authors could know anything about what was going on in the brain while students were doing the exercises.

According to the Brain Gym [website](#):

A balance involves:

- getting ready to learn
- setting a goal or intention
- pre-activities which playfully identify aspects of the learning that need more focus for integration
- a plan for integrating the learning into physical movement (in this case, through the BRAIN GYM movements)
- post-activities to identify the new learning

After the balance, new choices and possibilities are available to the student, and improvements are usually evident. The final, unnumbered step is to "celebrate the new learning." This is the step of play, exploration, innovation and implementation that is so essential to creative learning, yet often omitted in the classroom, where learners are pressed to begin a new task before even acknowledging the skill with which the previous one has been accomplished. Anyone who is so inclined can learn to facilitate

this process for self or for others by taking a BRAIN GYM course. The balance process is simple, yet requires deep understanding, based on a personal experience of the physical as well as the mental and emotional components of the learning process, for skillful, non-intrusive facilitation.

Well, 80 percent of the process sounds like an intelligent plan for learning, so why muck it up with pseudoscientific jargon about "neural repatterning" or coordinating the front and back of the brain?

As noted above, one study involved just four adults. Another *hypothesized* "that Brain Gym movements can eliminate or greatly ameliorate the symptoms of hyperactivity, learning disabilities, Attention Deficit Disorder, emotional handicaps and even Fetal Alcohol Syndrome." One study involved 16 elementary school teachers who engaged in ten minutes of random movements in a room or a series of five Brain Gym activities. "The results indicated that the hearing of the teachers was better after the Brain Gym activities than after the random movements."

Is it possible to market to educators an educational product as scientifically grounded that isn't based on convincing scientific evidence? Apparently, it is.

One trick is to sound scientific. Brain Gym relies on giving the appearance of being based on sound neuroscience. It isn't. There is, however, a theoretical framework as to how the brain works and malfunctions that is put forth by the Dennisons as a basis for developing the, according to the [Brain Gym website](#), "26 easy and enjoyable targeted activities that integrate body and mind to bring about rapid and often dramatic improvements in: concentration, memory, reading, writing, organizing, listening, physical coordination, and more."

According to the Dennisons (1989), the right and left hemispheres must be coordinated. The front and back parts of the brain must also be coordinated. And the top and bottom parts of the brain must be coordinated, too. They call these types of alleged brain coordination *laterality*, *focusing*, and *centering*. While it is pretty much common knowledge that the parts of the brain must communicate with each other for proper brain function, the picture the Dennisons draw is so general as to be useless for developing any meaningful activities that might improve brain function.

When the Dennisons do get specific, they make odd claims not supported by good science, such as their claim that yawning can improve eyesight. (Dennison believes yawning improved his own eyesight.) None of the activities developed by the Dennisons for improving "academic learning actually included academic instruction as a component" and no diagnostic tool is provided for identifying which of the three areas of brain coordination needs the most attention (Hyatt 2007).

One of the foundational ideas of the Brain Gym is the thoroughly discredited idea of [motor patterning](#) put forth by Doman and Delcato:

Their technique was very labor-intensive and included guided creeping, crawling, rolling, swinging, rubbing with a pot-scrubber, fluid-restriction, and carbon dioxide inhalation (to promote intracranial vasodilatation). Later, megavitamin therapy was added.

The Doman-Delcato treatment has been condemned for years by the major professional organizations concerned with cerebral palsy and mental retardation victims. It is also very expensive. However, it still manages to find clients. ([Friedlander 1983](#))

The basic idea of the Doman-Dolcato treatment was that the brain functions properly only if motor skills are learned in proper sequence. So, if a child is retarded it may be because the child walked before she learned to crawl. The cure for retardation: crawling exercises. There is no body of science supporting this nonsense, yet it is one of the bases for Brain Gym.

Another intellectual source of Brain Gym is Samuel Torrey Orton (1879-1948), who attempted a neurobiological understanding of dyslexia.

Orton's key contribution to the field of education was the concept of "multisensory" teaching—integrating kinesthetic (movement-based) and tactile (sensory-based) learning strategies with teaching of visual and auditory concepts.\*

Orton also posited that "mixed cerebral dominance" causes reading difficulties, an idea that "research has not substantiated"\* but which seems to have been adopted by the Dennisons for Brain Gym.

Brain Gym also builds its activities from a belief in the efficacy of [perceptual-motor training](#), another area where the scientific research does not support the claim that such training is an effective academic intervention.

Some of the strategies used to purportedly improve perceptual–motor skills and improve learning have included activities such as crawling, bouncing balls, throwing beanbags, and walking on a balance beam. Barsch (1967), for example, promoted a movement curriculum called Movigenics, claiming that the development of movement patterns was related to learning efficiency.\*

One area of perceptual-motor training that Brain Gym uses is vision therapy.

The American Academy of Pediatrics, American Academy of Ophthalmology, and American Association for Pediatric Ophthalmology and Strabismus issued a joint statement strongly discrediting vision therapy (American Academy of Pediatrics, 1998).

In that statement, they noted that eye defects do not cause letter reversals and that no scientific evidence supports claims that the academic skills of children with learning disabilities can be improved through vision training or the use of colored glasses. Whereas visual problems should be corrected, there is no convincing body of research supporting the use of optometric visual training as a treatment for learning problems (Keogh & Pelland, 1985; Sieban, 1977; Silver, 1995).\*

Brain Gym claims that it "focuses on the performance of specific physical activities that activate the brain for optimal storage and retrieval of information" but these activities are not related to any scientifically established methods that actually do any good for anyone trying to learn to read or write or think critically or do math. Furthermore, it licenses instructors to pass on its bogus ideas to schools.

According to the Brain Gym FAQ:

It prepares students of all ages to practice and master the skills required for the mechanics of learning. The program includes a simple teaching format, a language for stress-free learning, and a series of movements for integrating learning into the physiology. BRAIN GYM offers the learner a self-directed system with which to pace individual learning needs, building self-esteem through the successful mastery of skills.

This program is distinctive because it addresses the physical (rather than mental) components of learning.

Brain Gym might address the physical components of learning but there is no scientific support for the claim that the physical activities it teaches have any learning benefit. The claim that crawling or yawning or jumping or moving your head from side to side can affect, in any important way, neural connections that make learning possible is rubbish.

One of the strongest critics of Brain Gym is [Ben Goldacre](#) of Bad Science, who calls Brain Gym "ludicrously pseudoscientific."\* He says children write to him to tell him how stupid it is, while teachers write to defend it. Goldacre doesn't quarrel with all the activities of The Brain Gym. For example, students are advised to drink water before tests. There's nothing wrong with drinking water before tests, but these folks think the water goes to the brain, which is 90% water, and this will help you think better. They're actually taught that if one holds the water in the mouth for a few seconds, it will go through the roof of the mouth and be absorbed by the brain.\* Even if you stand on your head while drinking water it won't go directly to your brain.

Goldacre writes:

If you like scandals, then this is one. The very same person who tells your child that blood is pumped around the lungs and then the body by the heart, is also telling them

that when they do The Energizer exercise then "this back and forward movement of the head increases the circulation to the frontal lobe for greater comprehension and rational thinking."

Beyond the stupidity of some headteachers, how has Brain Gym survived? A clue can be found in a set of experiments from the March 2008 edition of the [Journal of Cognitive Neuroscience](#), which elegantly show that people will buy into bogus explanations much more readily when they are dressed up with a few technical words from the world of neuroscience.

Here's a description of one of the Brain Gym exercises called "hook-ups":

[Hook-ups] shift electrical energy from the survival centers in the hindbrain to the reasoning centers in the midbrain and neocortex, thus activating hemispheric integration ... the tongue pressing into the roof of the mouth stimulates the limbic system for emotional processing in concert with more refined reasoning in the frontal lobes.

Sounds good, doesn't it? But it's unsubstantiated gobbledygook with no known connection to learning. Yet this and other Brain Gym exercises might actually relax or entertain students, and relieve some of the boredom of their everyday classroom activities. Still, what is the point of adding a layer of neuroscientific jargon to the activity except to market it to clueless educators?

Goldacre rants against the claims made by those who teach Brain Gym:

They teach that rubbing your ribcage will stimulate the carotid arteries beneath and increase blood to the brain and "activate the brain for an increased flow of electromagnetic energy" ....They promote strange physical origami exercises called "hook-ups" where you press your fingers against each other in odd patterns, because these "connect the electrical circuits in the body, containing and thus focusing both attention and disorganized energy," as they say in the Brain Gym teaching manual.

They teach a funny way of wiggling your ears with your fingers that "stimulates the reticular formation of the brain to tune out distracting, irrelevant sounds and tune into language." They teach that rocking your head back and forth will get more blood to your frontal lobes "for greater comprehension and rational thinking." This stuff is bonkers.

I could go on. In fact, I will, because so many teachers have written in to defend it. They teach that a special theatrical yawn will lead to "increased oxidation for efficient relaxed functioning." Oxidation is what causes rusting. It is not the same as oxygenation, which I suppose is what they're getting at, and even if they are talking about oxygenation, you don't need to do a funny yawn to get oxygen into your blood: like most other animals children have a perfectly adequate and utterly fascinating physiological system in place

to regulate their blood oxygen and carbon dioxide levels, and I'm sure many children would rather be taught about that, and indeed about the role of electricity in the body, or any of the other things Brain Gym confusedly jumbles up, than this transparent pseudoscientific nonsense.\*

It's not the exercises themselves that raised Goldacre's ire, but the pseudoscientific jargon used to make the exercises seem like they were based on scientific evidence. Despite five years of criticizing Brain Gym, Goldacre finds that the program keeps on finding advocates even if it has been around for thirty years without providing sound scientific evidence for its claims. It hasn't needed to, since those who buy into the program are either children who naively assume their teachers know what they are doing or teachers who are bamboozled by the pseudoscientific jargon or seduced by charismatic and enthusiastic believers.

Brain Gym seems to have put the cart before the horse. In recent years, there has been some [significant work on brain-based education](#). Once that work is understood, appropriate applications for learning will undoubtedly follow. One hopes that those educators disillusioned with Brain Gym will not be so put off by the approach that they will ignore anything having to do with brain-based education.

Did I mention that the program is [not free](#)? I inquired of a local trainer about enrolling in Brain Gym 101, a three-day course where one learns "the basic 26 Brain Gym® movements and the fundamental steps for sequencing these movements." The cost is \$400 as of February 8, 2008. A one-day seminar called Brain Gym in the Classroom is \$150 and includes water and snacks.

**See also** [Dowsing for Dollars: Fighting High-Tech Promises with Low-Tech Critical Thinking Skills by Robert Todd Carroll](#)

### **further reading**

#### **books and articles**

Barsch, R. H. (1967). Achieving perceptual–motor efficiency: A spaceoriented approach to learning (*Perceptual motor curriculum*, Vol. 1). Seattle, WA: Special Child.

Bruer, J. T. (2004). The brain and child development: time for some critical thinking. In [The Head Start Debates](#) (Brooks Publishing Company), edited by S. J. Styfco and E. Zigler.



[Dennison, Paul E. and Gail E. Dennison \(1989\). \*Brain Gym\* \(Teachers Edition, revised\). Edu-Kinesthetics, Inc.](#)

## **websites**

[Brain Gym® Building Stronger Brains or Wishful Thinking? Keith J. Hyatt. \*Remedial and Special Education\*, Volume 28, Number 2, March/April 2007, Pages 117–124.](#)

[ALTERNATIVE MEDICINE: AN OUTLINE FOR PHYSICIANS -- Edward R. Friedlander, M.D. December, 1983](#)

[Why "Sensory Integration Disorder" Is a Dubious Diagnosis \(2005\) Peter L. Heilbroner, M.D., Ph.D.](#)

[Keep your pupils stretched and watered by Philip Beadle June 13, 2006, \*The Guardian\*](#)

[Squabbles in Class by Ben Goldacre](#)

[Psychomotor Patterning by Steven Novella, M.D. \*The Connecticut Skeptic\* Vol.1 Issue 4 \(Fall 1996\) p. 6.](#)

[In Search of . . . Brain-Based Education by John T. Bruer](#)

[Brains.org](#)

[Leslie Wilson's Brain-Based Education website](#)

[A Fresh Look at Brain-Based Education by Eric P. Jensen](#)