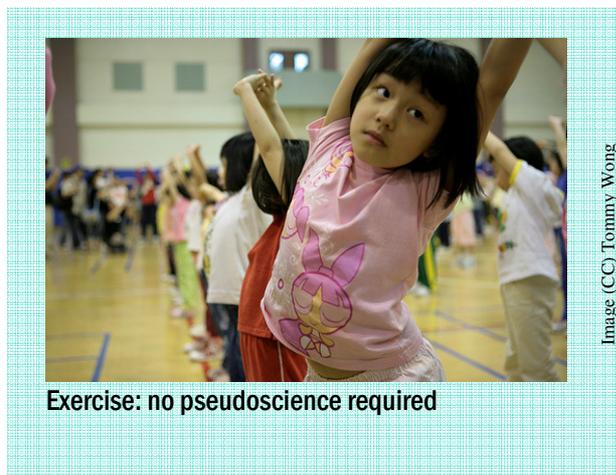


Brain Gym is a programme of teacher-led physical exercises which are claimed to improve the cognitive abilities of primary school children. These exercises are being taught with pseudoscientific explanations that undermine science teaching and mislead children about how their bodies work.

This briefing looks at a selection of the claims from the most recent Brain Gym guide (Teacher's Edition) and explains why these statements have no basis in scientific evidence.

**"I'm all for children doing exercise but I'm totally against giving them pseudoscientific reasons for why they should be doing it. The total cost of BG training must run into many thousands of pounds. Just think how much PE equipment could have been bought with the money."**  
*Anita Angier, teacher*



Exercise: no pseudoscience required

According to Brain Gym	Scientists' responses
<p>"Brain Gym activities... enable students to access those parts of the brain previously inaccessible to them."</p>	 <p>"There is no scientific evidence whatsoever that any part of the active brain goes "unused". Even when resting, there is brain activity occurring throughout. We don't need Brain Gym to make this happen, it happens naturally." <i>Dr Beth Losiewicz, cognitive scientist</i></p>
<p><b>The exercises</b></p> <p>"The student lightly touches the [Positive Points] above each eye with the fingertips of each hand... halfway between the hairline and the eyebrows. The Positive Points bring blood flow from the hypothalamus to the frontal lobes, where rational thought occurs."</p>	 <p>"Rational thought does not just occur in the frontal lobes, and there is no evidence that touching these points can alter blood flow within the brain." <i>Prof David Attwell, neuroscientist</i></p>
<p>"Brain Gym Lengthening Activities help students to develop and reinforce those neural pathways that enable them to make connections between what they already know in the back of the brain and the ability to express and process that information in the front of the brain."</p>	 <p>"This statement implies that knowledge is stored in the back of the brain and that information processing occurs in the front. This is not how the brain works; information is processed throughout the whole brain, and knowledge is distributed as well." <i>Dr Stan Lazic, neurobiologist</i></p>
<p>"The Elephant movement activates the inner ear for improved balance and equilibrium and also integrates the brain for listening with both ears..."</p>	 <p>"This movement could help children with specific balance and equilibrium problems. However, the mechanisms of binaural hearing are completely unrelated to those of balance and equilibrium." <i>Dr Beth Losiewicz, cognitive scientist</i></p>
<p>"The Brain Buttons (soft tissue under the clavicle to the left and right of the sternum) are massaged deeply with one hand while holding the navel with the other hand. Activates the brain for: sending messages from the right brain hemisphere to the left side of the body, [the brain receives] increased oxygen; [stimulates] the carotid artery for increased blood supply to the brain; [increases] flow of electromagnetic energy. "</p>	 <p>"There is no evidence that rubbing these areas promotes signalling from the right brain to the left of the body. The brain would only receive increased oxygen if its blood flow increased, but stimulating receptors in the carotid sinus leads to a fall of cardiac output and potentially a decreased oxygen flow to the brain. Massage of these points does not generate electromagnetic energy in the form of radiated light, heat or radio waves." <i>Prof David Attwell, neuroscientist</i></p>

Claims about how the body works	
<p>“Centering is the ability to cross the midline between the upper and lower body and the corresponding upper and lower brain functions: the midbrain (emotional content) and cerebrum (abstract thought). Nothing can be truly learned without feeling and a sense of meaningfulness.”</p>	 <p>“The idea of symmetry between brain and body does not hold true. The top of the body doesn’t match up with the top of the brain, and so on. Also, the midbrain isn’t the seat of emotional content. Emotional content is processed all over the brain, including the cerebrum and the amygdala.”</p> <p><i>Dr Spencer LaVere Smith, neuroscientist</i></p>
<p>“In the same way that electrical circuits in a house can become overloaded, neurological and physiological signals can become jammed and switch off, blocking the normal flow of brain-body communication... Hook-ups connect the electrical circuits in the body.”</p>	 <p>“This sounds plausible, but in reality the only time a neurological signal would become "jammed", "blocked" or "switched off" is during a pathological event such as a seizure, stroke, head trauma, or perhaps due to a neurodegenerative disorder.”</p> <p><i>Dr Stan Lazic, neurobiologist</i></p>
<p>“When the neck muscles are strong and there is fully developed head and body differentiation, the neurological circuitry between brain and body is available for optimal performance and achievement.”</p>	 <p>“The neural circuitry that connects the brain and the body is the spinal cord, which is located in and protected by the spinal column. While the brain communicates with all muscles of the body including the neck muscles, the strength of these muscles does not affect the performance of the spinal cord.”</p> <p><i>Dr Alanna Watt, neuroscientist</i></p>
<p>“Increasing the spinal column’s range of motion improves lines of communication between the central nervous system and the brain.”</p>	 <p>“If the nerves in the spinal column are completely blocked, there will be no communication between the affected parts of the body and the brain; it is called paralysis. There is no reason to believe you can specifically enhance those brain/body messages with exercises that increase the range of motion of the spinal cord.”</p> <p><i>Dr Beth Losiewicz, cognitive scientist</i></p>
<p>“All liquids [other than water] are processed in the body as food, and do not serve the body’s water needs... Processed foods do not contain water.”</p>	 <p>“Cola, coffee and beer are not treated like food at all; they are absorbed through the stomach and intestines by exactly the same mechanism as a glass of water. Processed foods usually contain a large amount of water, just read the back of a packet of processed ham.”</p> <p><i>Ian Robinson, neuroscientist</i></p>
<p>“Water is an excellent conductor of electrical energy... [drinking water] activates the brain for efficient storage and retrieval of information.”</p>	 <p>“Water is a poor electrical conductor and only by containing dissolved metallic solids such as salt is water able to conduct.”</p> <p><i>Dr Philip Coan, physiologist</i></p>
<p>“Working with electronic equipment (e.g., computer terminals, TV) is dehydrating to the body.”</p>	 <p>“Electronic equipment has no special ability to dehydrate people. Working with electronics is as dehydrating as reading a book, which is to say, not very dehydrating.”</p> <p><i>Dr Spencer LaVere Smith, neuroscientist</i></p>
The overall learning effects of Brain Gym	
<p>“Brain Gym is a series of simple and enjoyable movements that we use with our students in Educational Kinesiology (Edu-K) to enhance their experience of whole-brain learning. These activities make all types of learning easier, and are especially effective with academic skills”</p>	 <p>“I know of no evidence to support the claim that, by doing a particular repetitive activity, children will gain general benefits in learning. There have been a few peer reviewed scientific studies into the methods of Brain Gym, but none of them found a significant improvement in general academic skills.”</p> <p><i>Prof Colin Blakemore, neuroscientist</i></p>

### You might also be interested in...

Neuroscience and Education: Issues and Opportunities - A Commentary by the Teaching and Learning Research Programme

Available from the Teaching and Learning Research Programme: <http://tinyurl.com/2voxtt>

●●● This note is collated by Frank Swain with kind assistance from Sense About Science advisors. Additional research and monitoring by Simon Evans. April 2008

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