

6 Powerful **Brain** Research Facts

Here are six powerful pieces of research that have profound impact in our understanding of the new brain-based paradigm. This information is especially relevant for parents, educators, counsellors and anyone managing people.

1. NEUROGENESIS: Highly relevant is the recent discovery that the human brain can and does grow new neurons. Of special interest is that this process can be regulated and influenced by our everyday behaviors, including exercise, stress reduction, and nutrition. Parents and school programs can and should influence these variables. This discovery came straight from neuroscientists Gerd Kempermann and Fred Gage. **Practical application:** Support more, not less physical activity, and look for opportunities to enhance movement in any context. Monitor stress as it does matter to the brain and so does nutrition.

2. MIRROR NEURONS: Social conditions influence our brain in ways we never knew before. The discovery of mirror neurons, by Iacomo Rizzolatti (and colleagues) at the University of Parma in Italy, has some powerful implications for any environment we are in. As the name suggests, mirror neurons pick up and reflect what they are exposed to. This understanding suggests we be more proactive in managing the social environments of young people since they are more affected by it than we earlier thought. It may unlock clues to those with autism, since their mirror neurons are less active. **Practical application:** Pay attention to the environments you are in and how positive or negative they are. This is especially important for children and teens.

3. NEUROPLASTICITY: The ability of the brain to rewire and remap itself via neuroplasticity is profound. We now know the brain can rewire itself to repair damage to the vestibular system, from strokes, loss of hearing, loss of eyesight, from learning delays and more. We can influence the brain through skill building, reading, meditation, arts, career and technical education, and thinking skills that build success. The evidence is compelling when the correct skill-building protocol, verified by the work of neuroscientists Michael Merzenich and Paula Tallal, is used. Systematically building a skill allows positive and significant changes to be made in our brain, in a short amount of time. But without understanding the “rules for how our brain changes,” we can waste time, and money and lessen the sense of accomplishment. **Practical Application:** Increase a person’s perception of choice, and offer support and a structured process for learning, including mentoring.

4. EPIGENETICS [OUTSIDE OF GENES]: An old school debate was “environment versus genes.” We now know that there’s a third element: gene expression. This is the capacity of our genes to respond to chronic or acute environmental input. Neuroscientist Bruce Lipton

and Ernest Rossi have written for laypersons how our everyday behaviors can influence gene expression (Lipton, 2005 and Rossi, 2002). New journals called *Gene Expression*, *Gene Expression Patterns* and *Nature Genetics* explore the mechanisms for epigenetic (outside of genes) changes. Evidence suggests that gene expression can be regulated by what we do which, in turn, will enhance or harm long-term change prospects. **Practical application:** Raise expectations for any kind of performance or skill, but be sure to give people the skill sets, relationships, and hope to succeed. A positive nurturing environment is essential for optimal gene expression.

5. EXERCISE & INCREASED BRAIN MASS: The current high stakes testing environment means some educators are eliminating recess, play or physical education from the daily agendas. The value of exercise to the brain was highlighted in a recent cover story in Newsweek. More importantly, there are continual studies in *The Journal of Exercise or Pediatric Exercise Science* or *Journal of Exercise Physiology Online*. The discovery is that exercise is strongly correlated with increased brain mass, better cognition, mood regulation, and new cell production. This is relevant not just for students but also adults of all ages. Physical activity triggers the release of glycogen, which gets glucose into the bloodstream and the brain. **Practical application:** Make 30 minutes of physical activity a mandatory part of your day, 5 days a week, and read John Ratey's new book *SPARK: The Revolutionary New Science of Exercise and the Brain.*"

6. THE DISCOVERY THAT ENVIRONMENTS ALTER OUR BRAINS IS PROFOUND. The physical environment we are in can raise or lower critical brain chemicals such as cortisol, acetylcholine, and serotonin. This can influence behavior. This research goes back decades to the early work of the first trailblazing biological psychologists Mark Rosenzweig at UC Berkeley and Bill Greenough at the University of Illinois, Champagne-Urbana. In fact, a new collaboration has emerged between neuroscientists and those who design environments (architects). Their website reads... "The mission of the Academy of Neuroscience for Architecture is to promote and advance knowledge that links neuroscience research to a growing understanding of human responses to the built environment." This is relevant for all learning environments including the home. **Practical application:** Upgrade your work and home environment with enrichment such as music, art, and social spaces for positive interaction. This does not have to cost a lot and could have significant benefits for your mental health.

Adapted from "[10 Critical Things You Should Know About Brain Based Education](#)" ©Eric Jensen through Dr. Jean Seville Suffield, Senior Faculty, WGI, and Trainer in Brain-Based Education, jeanseville@hotmail.com and Lynn Sumida, Senior Faculty, WGI, lynnsunida@miruspoint.com