

A Common Ground Conversation
with John Ratey, M.D.
November 2009

Dr. John Ratey, author of the international sensation, Spark: The Revolutionary New Science of Exercise and the Brain, spoke to packed audiences at three Common Ground events in November 2009. Ratey, who serves as associate Clinical Professor of Psychiatry at Harvard Medical School, is a prolific scholar who has published more than 60 peer reviewed articles and lectured around the world on aggression, autism and ADHD. Below, he explains why he now spends almost every waking moment urging Americans to give up their sedentary, electronics-driven lifestyles. Citing the latest breakthroughs in neurobiological research, he has sparked an international movement founded upon clinical evidence that exercise is absolutely essential for healthy brain development. Today's children are most at risk, he says, issuing an urgent plea for parents and educators stop the "dumbing down" of a generation and to rethink the role of exercise in promoting learning and emotional health.

Everyone knows that exercise is good for you, so what is "revolutionary" about your message in "Spark?" Parents and schools need to start teaching children that exercise is not just about keeping in shape, keeping their bodies fit and looking good. We now have concrete, scientific evidence that exercise has a direct effect on their brains, intellectual function and academic performance. Just this afternoon I got a note from one of the premier investigators in this field and he said that we now have such overwhelming evidence that exercise improves cognitive function that we need to start a groundswell, a movement, a public policy forum, to spread the word. The evidence is absolutely clear - exercise is critical to a healthy, functioning brain.

Does this mean that as Americans grow increasingly sedentary our culture is "dumbing down?" I think there is evidence, but it's hard to quantify. I believe that we have been on a dumbing-down, down-hill course for some time, partly because our environment has changed so much that it has led to an increasingly sedentary lifestyle and a serious obesity problem. We now live in a culture that provides us with a glut of immediate gratification toys and tools - the Internet, Facebook, Twitter, video games, the clickers, the 20 million TV channels to choose from and YouTube. Because of this incredible access to a variety of immediate gratification devices, our culture has become media-driven, especially among young people with a fixation on worrying about celebrities such as Britney Spears and Lindsay Lohan.

Is the intellectual caliber of students being affected? Oh, absolutely. (University professors) are picking up an overall lack of contemplation and an overall decline in the ability of college students to find the constructs, words and ideas they need to express themselves independently. Instead, they are relying on what is given to them by the popular media. I think this trend is really important. I think there is an increasing homogenization of thinking. Certainly, (today's students) are exposed to a great deal of information, but the ability to put it all together on a deeper level seems to be declining.

What can a parent do to counteract such forces in their children's lives? This is where I think exercise and play come in. And by play, I mean play with others – having fun on a dance or jump rope team. Getting really involved in something activity-based so that kids can be together with other kids.

In *Spark*, you make the point that unstructured play, as opposed to adult-orchestrated activities, tends to be more stimulating to children's cognitive functions; that there is a definite advantage to a child playing "pick up" ball, for example, as opposed to a heavily coached sport. Certainly, it's best to have these kinds of choices, but the reality is that you have to have a forum for those kinds of things to happen. The concept of neighborhood play is pretty much gone. Everyone is so structured and worries about safety have become paramount. I think we need to recognize that we overprotect our children, *really* overprotect them. That's why there are all these battles over parents becoming too involved, helicopter parents, the soccer moms, the soccer dads and what I call the "boy in the bubble syndrome." Parents have taken it too far. They worry about every little thing and they are distressing over the normal ups and downs of life.

You are the father of two grown daughters. When they were children, what did you do to promote exercise in their lives? This was before I began researching exercise and the mind/body connection, but we were still very active. We provided an example for them. We provided opportunities and outlets and they picked up on it. Nothing was forced, but it was an expectation, just like learning to play the piano and doing well in school. They also grew up in an area where there was a peer expectation and group expectation to be physically active.

If you had the power to design a school so that exercise was incorporated into the curriculum in a way to promote optimal brain health, what would that school look like? First of all, there would be heavy emphasis, initially in pre-kindergarten and through grades 3 and 4, on recess and play. It would encourage kids to make up games, encourage them to develop an association with the group. One of the most important positives about play is that you learn how to affiliate and learn how to do what is necessary in a social interaction.

So you believe play should be integral to the curriculum because it actually enhances the brain and the ability to learn? Absolutely, play is a huge factor.

Why do you think working out or playing with other people, as opposed to doing so alone, is more beneficial to the brain? What we know is that when you are in a highly active, highly stylized activity, such as dance or taekwondo, intense learning occurs as you have to navigate your own position as you move. The challenge is magnified whenever you add movement in a three-dimensional space, and even more so when you add it with a partner. So, that is why I say probably the best activity to do is one that has a high aerobic challenge and the type of complex movements that challenge the brain.

This can certainly be true of some sports, and any of the team sports, really, as long as the person is actually *playing* that sport and not sitting on the bench.

Meaning that it doesn't work as well for kids when winning becomes more important than the full participation of each child? All activities that require strategy and interaction can have positive benefits. There's nothing wrong with practicing to develop one's individual skill in a sport. These are all wonderful activities to make the brain work better, but the environment has to be positive to work optimally.

You believe many parents make a mistake by pushing their children to specialize in a sport too early. Can you explain? I think that's a big, big issue these days. So many kids are doing one sport all the way through and just focusing on that. It's really crazy, you know. It's like deciding at age 10 that your child is going to go to law school and then just pushing and pushing for only one college to get there. We are so over structured. It creates an unreal expectation, and if children can't do it, then they really fall apart.

How about injuries from repetitive movements in kids who specialize early? Repetitive physical injury is increasingly common. For instance, my daughter played on four soccer teams and played very highly competitive soccer in college. All the girls on her college team had a long list of injuries and many had had operations in high school. The big thing was icing these kids down pre-game and post-game because they overstrained themselves or didn't train right, especially the girls. It's a problem. I mean some highly motivated kids really get into a sport and want to be the best and all that, which is great and wonderful, but we have to be careful.

As our children get older, there seems to be less and less time for "play." They often attend costly, highly academic schools, get tons of homework, and have varsity sports weekdays, club sports on the weekends and then SAT tutors heaped on. It's easy to see why parents, schools and kids might make play and recreational exercise less of a priority. How can such an ingrained, unhealthy dynamic be stopped? We need to all take a deep breath and really reflect on what we are doing with these incredibly high expectations. We need to think about whether they really make sense in our world today and whether they are helping us develop well rounded, well-grounded children who feel accepted and who accept themselves. Young people need to push themselves, for sure, but we need to be honest if what we are doing is having a negative overall effect on our kids.

What should the ideal school do for students, as they get older, entering middle and high school? Our schools need a daily, highly developed physical education program that really focuses on individual fitness, first, and then on participation with others, second. It is really important to start early and then to continue consistently in our schools, developing the idea that this is just part of the norm, so that it becomes something that the kids are ready for and that they begin to learn that daily exercise is not just for their bodies, but also for their brains. We need to help them understand how to use exercise when they get overly tense. One of the challenges and directives for the

P.E. staff should be for them to be conversant with what exercise can do for the brains of kids. They need to know how to effectively help them use exercise to deal with stress and impulsive behaviors.

Are today's physical education teachers properly trained to meet those needs? No. There is a huge gap in their training. A P.E. teacher's traditional focus has been on developing sports, skills and, you know, winning. So much of the focus has been on coaching and making your teams better, whereas the focus really has to be on those kids who are *not* going to be naturally playing on such teams. If kids want to take up a sport, that's great, but it's much more important to get everyone involved. It's much more important that every kid be on a flag football team or an intramural team rather than take part in no sport or some sport where they sit on the bench. It should be the charge of every P.E. department to make sure that every kid has an opportunity to do things physically, every school day. Every P.E. department should teach kids how they can use exercise to manage feelings, impulses and those periods when they are frustrated or depressed. In general, what I am saying is that P.E. curriculums should be changed into wellness curriculums that include all the things health teachers should know. We should not be as focused on sports and skill development, but rather our focus should be on the total kid – emphasizing diet, exercise and other lifelong wellness issues.

Are there pioneering schools that teach kids the neuroscience of exercise as part of an effective wellness curriculum? Most schools still haven't made that connection; even those that may highly value exercise haven't gone that far. But there is one K-8 school for reading-troubled students that I work with that actually keeps pictures of the brain on the walls of its gym. Whenever they do an activity, they point out the pictures and explain what parts of the brain they will be activating through movement. This has become a way for the teachers to help their students understand what they are doing, why they are doing it and why it might help them feel better or more in control.

Is there evidence that providing kids with this kind of direct knowledge about their brains makes them more resilient or motivated? Well, knowledge is power. I don't know if anyone has really looked at that in kids (in a formal study), but certainly there is evidence that as people become more fit, they become more resilient and emotionally healthy, whether they understand the dynamics of why that happens or not. For instance, the military is now adopting samurai training to make Marines more fit and resilient in battle, adding on tools such as meditation and mindfulness training to fitness training. The goal is to provide Marines with a more powerful integration with themselves, their bodies and what they may be doing on and off the battlefield.

Please explain what you mean by "brain breaks," a practice you encourage both in the classroom and at home. Well, kids take breaks from homework and studying all the time, but often these breaks have far too much to do with computers, text messaging or video games. What I mean by "brain breaks" is that kids probably will do better if they have interspersed physical activity when they are studying. For example, if a kid gets stuck writing a paper, parents should know that five or ten minutes of having them jump rope, get on a trampoline, shoot baskets or even run around the house can lead to a

breakthrough. Once kids begin to see the benefit of such brain breaks, then they can take on a life of their own. For example, I advised a mom to have her daughter jump rope when she had trouble with her math problems. The girl not only found it very helpful academically, but she is now a member of the regional jump rope team. It has had a profound effect on her development and her sense of self.

What do you mean when you say that exercise works like “a little bit of Adderall and a little bit of Prozac” notably benefiting kids with learning differences? One way to think about exercise is that it helps bring the brain back into a state of equilibrium in which there is less noise and less stress in the brain itself. Obviously, this creates a better brain environment for anyone to plow ahead and work, perform or whatever. But it works especially well for people who struggle with dyslexia, learning difficulties and ADHD.

What about exercise and mood disorders, such as anxiety? It definitely helps anxious kids. One of the things that happens with anxious people is that they respond to their bodily states as they get more and more agitated. Their blood pressure rises, causing more stress, and triggering more worries until it can turn into an anxiety attack. Exercise may be used to help them normalize their reactions and control their anxiety in a positive way. It helps give them a sense of control over their own psychological states and body reactions

In our Common Ground audience surveys, two questions kept coming up about your work – why is it so hard to exercise regularly, even though we know it is good for us, and what can we do to make it a regular part of our life? Unfortunately, we live in a very busy world where exercise has to be structured in. You have to ritualize it. The best way to do this is to make a regular appointment with friends. Walking the Stanford dish is a perfect example. Look for some kind of exercise that provides an interaction with others and that keeps you committed to showing up. Create some kind of obligation that pulls you into exercise. Paying for a trainer is one way to go since you don't want to waste your money. Keeping a log and writing down goals for your exercise regimen can also help, such as pledging yourself to take 10,000 steps in a certain time period.

When it comes to kids, you say that something as simple as having them sit on large exercise balls can increase their academic focus and performance in class. What concrete things can parents do to help “spark” the minds of their children at home? First off, they should experiment and find out if their kids do better reading or typing when they are standing. They may find that sitting on one of those large exercise balls will help them tolerate frustration more during homework. Also, creating a “standing desk” where they can stand to write, read or work on the computer may really help them. Schools used to have standing writing desks until, really, the 19th century. Many people, including famous authors, still do it. The idea is that standing activates the brain more because you are using more muscle groups.

Any more advice for families? Group activities are key. They make exercise more fun for kids. Try taking family hikes, family runs, and playing tennis together. Play with your kids; don't just sit on a bench watching them play soccer. You need to be a role model for your child by making exercise a family priority.

What can we do as parents to make our schools more healthy and productive?

Parents should lobby to increase movement and activity within the classroom. They should make sure that teachers give students brain breaks, especially if they are in 90-minute periods.

Are daily exercise and regular breaks as important with high school students as with children in lower grades? Absolutely. High school students need lots of movement – jumping jacks, calisthenics, sit-ups, push-ups – something to get their bodies moving and their brains working. This will lead to much improved attention and motivation. One of the biggest errors that school districts make is making physical education less important in senior high school. That is just retarded! Most high schools spend their time and resources on their student athletes and sports teams. They neglect the physical education of the vast majority of students, those who will never make varsity and are not natural athletes. Every kid in high school should be engaged in an aerobic activity every day. They need to be given physical challenges every day. We have a very long way to go in this country.

As we age, is it ever too late to reap the brain benefits of exercise? It is never, never, ever too late. We now know that exercise can flip around our genes. It can trick our body into thinking it's younger. It helps ward off dementia and a host of other physical problems. It really helps protect cognitive function in women in the post-menopause years and it helps both men and women live longer, more fulfilling lives.

So, if you really care about your family, get off that couch and start exercising?

Absolutely. That may be the best motivation to keep exercising every day.