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For Better Grades, Try Gym Class

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If you want a young person to focus intently in school and perform well on tests, should you first send him or her to gym class? That question, which has particular relevance for school districts weighing whether to reduce or ax their physical education programs to save money, motivated a number of stimulating new examinations into the interplay of activity and attention. Some of the experiments studied children; others looked at laboratory rats bred to have an animal version of attention deficit disorder. For both groups, exercise significantly affected their ability to concentrate, although some activities seemed to be better than others at sharpening attention.

The most striking of the new studies involved 138 schoolchildren ages 8 to 11 who were living in Rome. The children were physically healthy, and none suffered from serious attention deficits. But like most children that age, they found it difficult to remain fully engaged in their lessons as the school day wore on. As the study's authors, all affiliated with the Foro Italico campus of the University of Rome, point out, children "who undergo prolonged periods of academic instruction often reduce their attention and concentration."

To determine whether exertion could make students less distracted, the researchers, whose study was published last week in *Medicine & Science in Sports & Exercise*, had the children complete several types of gym classes, as well as a typical instructional or lecture class. Just before and immediately after the classes, the children took a written test that required them to pick out certain letters from long chains of symbols in a short time. The test is widely accepted as a good indicator of a person's attention and ability to concentrate.

The children's test scores rose after each of the classes. But by a wide margin, their scores increased the most after a 50-minute gym class that concentrated on endurance exercise. In that session, the young students ran, walked, skipped and otherwise kept moving for the duration of the class. Afterward, according to their test scores, they were much better able to focus.

Interestingly, the children did not improve as much after a 50-minute gym class that required them to learn new drills with a ball. That session, which was “geared toward the development of both motor control and perceptual-motor adaptation abilities,” required more thought than the endurance class, the researchers wrote. Afterward, their scores on attention tests rose, but not by as much. The researchers speculated that asking the students to both think and move was too much, inducing “an excessive stress load” on their brains.

These findings resonate intriguingly with those of other newly published experiments involving lab rats bred to have the symptoms of attention deficit hyperactivity disorder. These rats are twitchier and even less capable of settling down than typical rodents. They also can't seem to stop investigating meaningless stimuli. When researchers shine a light into these rats' cages, the animals keep going to the glow, long after they should have learned that the light was unimportant.

But researchers at the department of psychological and brain sciences at Dartmouth University found that giving adolescent rats access to a running wheel for three weeks before starting to shine the light in their cages significantly altered how the young animals responded. The exercised rats noticed the light, investigated it a few times and then moved on. Running had enabled the attention-deprived rats to better focus on what was meaningful — or not — in their cages.

The full effect of exercise on attention, though, remains tangled. During a separate part of the experiment that presented the A.D.H.D.-afflicted rats with a learning challenge, the animals that had exercised were no better than sedentary rodents at figuring out that a different light cue meant food. Exercise did not seem to boost their intellect, just as the Italian schoolchildren didn't focus as well if their gym class added mental tasks to the physical exertion. “There is still a great deal that we need to learn about which parts of the brain preferentially are affected by exercise” in animals or people with attention deficits, said Andrea Robinson, a doctoral student at Dartmouth who conducted the rat experiments.

Still, she continued, the current findings are encouraging. “The implication is that exercise might in fact help to treat” young people with A.D.H.D. and, more broadly, enable all children to better absorb lessons in geometry or geology. “If I had to extrapolate” to children from her group's findings in rats, Ms. Robinson said, the lesson would be, “let kids run around” during the school day and don't require them constantly either to sit or to think. Or, to be more blunt, it may be time to start looking at gym classes not as lost academic hours but as a means to scholastic enrichment.