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How Self-Control Drives Student Achievement

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Brain research sheds light on how high schools can foster a crucial skill at the time when the brain is most ready to learn it.

We've known for some time that the brain is particularly malleable during the first few years of life, which has prompted renewed interest in the importance of early childhood education. However, brain science now reveals that a second period of heightened plasticity occurs during adolescence, a time when the brain is especially prone to change (Lillard & Erisir, 2011). This finding should stimulate interest in secondary education as an opportune time to intervene to improve students' lives.

Among experts in developmental psychology, there's new interest in noncognitive skills as important influences on adolescents' learning and academic achievement (Tough, 2012). In particular, self-regulation—the ability to exercise control over our feelings, thoughts, and behavior—turns out to be a stronger predictor of success in the classroom than intelligence, talent, or standardized test scores. That's because strong self-control is the main contributor to traits like perseverance, determination, and grit, all of which have been linked to higher school achievement as well as to success in the world of work.

Within the field of positive psychology, interest is growing in how schools can facilitate adolescents' emotional growth, including the development of stronger self-control (Steinberg, 2014). Of course, the more traditional focus in school on the prevention and amelioration of emotional problems is still valid—adolescence is the most likely period for the emergence of serious mental health issues, such as depression or substance abuse. But we should also be asking what schools can do to stimulate *positive* emotional development during this stage, both for its own sake and because research shows that school achievement depends a lot on motivation and not just on conventional academic abilities.

High Schools: Not Making the Grade

We've known for some time that U.S. high schools are underperforming, but little that we've tried with respect to curriculum or instruction has worked particularly well. Reading and math scores on the National Assessment of Educational Progress (NAEP) have remained flat among U.S. 17-year-olds for the past 40 years, whereas NAEP scores among our younger students have risen over this same time period. In recent NAEP assessments, only 6 percent of 17-year-olds score at the highest level of reading proficiency for their age, and just 7 percent of 17-year-olds score at the highest level of proficiency in math. Far more elementary and middle school students score at the highest proficiency levels than do their high school counterparts (National Center for Education Statistics, 2013).

The problem may be that for all but the very best students—the ones bound for the most selective colleges and universities—high school can feel tedious and unchallenging. One-third of U.S. high school students report that they have little interest in school and get through the day by fooling around with their friends (Steinberg, 1996).

One might be tempted to write off these findings as mere confirmation of the well-known fact that adolescents find *everything* boring. However, more than 80 percent of foreign students who have attended U.S. high schools report that

their home schools are more challenging, and more than 50 percent of U.S. high school students who have studied in another country agree that their home schools are easier (Loveless, 2002, 2006). Despite all the media attention given to how stressed-out adolescents are, U.S. high school students spend far less time on schoolwork than their counterparts in the rest of the world do.

Enter Self-Control

The fact is, U.S. high school students may not be up to the challenge because they lag behind many of their international counterparts in an important skill—self-control. Students who have strong self-restraint and the capacity to delay gratification have a greater advantage in high school than they do in elementary school. A child doesn't need much perseverance to succeed in 2nd grade. In other words, it's easier to improve elementary schools without paying attention to noncognitive skills. We don't have this luxury in high schools.

As students progress from elementary to middle to high school, the work becomes more challenging, and the demands for self-reliance intensify. Adults provide less supervision and assistance, and students are expected to work more independently. High school assignments take longer to complete, and exams take longer to study for. If we want to improve our adolescents' achievement, we're going to have to rethink secondary education so that it's more geared to strengthening the self-control that students need to be successful in school and beyond.

In a cross-national study I directed of nearly 4,000 adolescents from 11 countries, ranging from 5th graders to college undergraduates, we tested students' self-regulation abilities at different ages using behavioral tasks that required planning and self-control (such as the "Tower of London," in which hasty decisions interfere with successful performance), as well as standard personality measures (such as those assessing impulsivity) (Steinberg & Chein, in press). The comparison between the results for Chinese and U.S. students is instructive. At 5th grade, there were few differences in self-control—the Chinese children scored only about 10 percent higher. But this gap widened little by little each year. By 9th grade, the Chinese students scored 20 percent higher; by college, they scored 45 percent higher. This advantage most likely isn't the result of cultural differences in temperament. If it had been, we would have seen a larger self-control gap earlier on. Rather, it's likely a consequence of how each country raises and educates its adolescents.

What Schools Can Do

Research shows not only that adolescence is a time of considerable brain plasticity, but also that brain systems and regions that govern self-regulation are especially malleable during this time (Selemon, 2013). Given this knowledge, here are some ways that schools can strengthen student self-control and facilitate learning and achievement.

Make school more demanding for all students

In its coverage of U.S. secondary education, the popular press tends to focus on two relatively small groups: students headed for elite colleges (many of whom are under tremendous stress and pressure) and students at risk for dropping out (many of whom come from the most disadvantaged communities).

These stories are important to tell, but they leave out the vast majority of students, who don't fall into either of these extremes. These high school students tell us they're bored. Schools don't routinely push them beyond their current capabilities—that is, the students don't always get the sort of stimulation necessary to develop brain regions that support higher-order cognitive skills and self-regulation. And more instruction aimed at the rote memorization of facts won't help. Research shows that repeating the same task, without additional challenge built into the practice, does little to stimulate brain development. Brain development is stimulated by demanding more from the brain than had previously been asked (Hulme, Jones, & Abraham, 2013).

Attend to students' physical health.

Despite considerable research showing that aerobic exercise is one of the most important contributors to healthy brain development (Verburgh, Konigs, Scherder, & Oosterlaan, 2014), many school districts have eliminated physical education from their daily curriculums. In many high schools, the only students who get regular exercise are those who are talented enough to play on competitive interscholastic teams.

Given what we know about the importance of exercise for brain development, one hour of each school day should be devoted to physical education. This will likely raise students' test scores more than additional instruction will. As with academic stimulation, the type of physical exercise that students are asked to do matters. Team sports, because they're often demanding mentally (with respect to strategy); psychologically (with respect to cooperation and teamwork); and physically, may be especially beneficial. Team sports don't have to be interscholastic or limited to the most athletically able students to provide these benefits.

Bring in mindfulness programs

There's growing evidence that mindfulness training stimulates the development of brain systems that support self-regulation and strengthen self-control (Davidson et al., 2012). A small number of schools around the United States have incorporated mindfulness exercises, such as meditation, into their daily routines, and preliminary evaluations of these efforts have shown improvements in student learning as well as reductions in problem behavior (Steinberg, 2014). Other

ways of teaching mindfulness, including yoga, may also be beneficial.

At a time of shrinking school budgets, I realize that any call to add meditation and yoga to the high school curriculum won't be warmly embraced and may be ridiculed as extravagant. To this resistance I can only say that our persistently mediocre record of secondary school achievement, despite the relatively long school days we force our adolescents to endure, suggests there's plenty of room to rethink how students might spend that time more profitably.

Strengthen students' working memory

There's some evidence that providing training on certain demanding cognitive tasks, especially those designed to strengthen working memory, may contribute to the development of other skills and capabilities, including self-control (Morrison & Chein, 2011). Working memory refers to how we retain information in our minds and use it—like keeping the first part of a long sentence in mind while you finish reading it so the end of the sentence makes sense, or holding a set of directions in your head as you drive so you know what landmarks to look for. Working memory is essential to things like planning ahead, considering multiple possible actions at the same time, or comparing the short- and long-term consequences of a potential decision.

One effective training exercise is the "*n*-back" task, in which students are presented with a sequence of items (like letters) one at a time and asked to indicate whether the letter shown is the same as the letter that appeared *n* letters ago.

Offer an SEL program

There's good evidence that social and emotional learning (SEL) programs contribute to the development of self-regulation, as long as they follow the SAFE principles (Durlak, Weissberg, Dymnicki, Taylor, & Schellinger, 2011): They should be *sequenced, active, focused, and explicit*.

Anyone interested in bringing SAFE SEL programs to their school should consult the [Collaborative for Academic, Social, and Emotional Learning](#), a nonprofit organization that conducts systematic evaluations of SEL programs, as well as the [U.S. Department of Education's What Works Clearinghouse](#), which maintains lists of school-based social and emotional learning programs with proven track records of success. Although we tend to think of SEL programs as geared primarily toward students with emotional problems, like aggression, SEL programs benefit all students.

Our Last, Best Chance

It's time for a new national conversation about the health, development, and academic success of our teenagers. But the conversation needs to be different from the one we've been having. It needs to apply the insights into adolescent brain development that have emerged over the past two decades.

We need a national focus on adolescence that is similar in magnitude to our focus on children from birth to age 3. Periods of heightened brain plasticity are times when our experiences are likely to have enduring effects. The first few years of life constitute one such period; we now know that adolescence is another.

The brain will never again be as plastic as it is during adolescence. We can't afford to squander this second opportunity to help young people be happier, healthier, and more successful. Adolescence is our last, best chance to make a difference.

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