



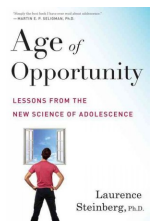
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Q&A: Plumbing The Mysteries Of The Teenage Brain

by ANYA KAMENETZ

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Age of Opportunity Lessons from the New Science of Adolescence

by Laurence Steinberg

Hardcover, 264 pages

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Do you remember the summer when you first fell in love? The songs that were playing on the radio, butterflies in the stomach, the excitement of a stolen kiss? The tendency of our brains to especially hold onto memories from the teenage years is called the "reminiscence bump."

It's one of the many distinctive characteristics of the adolescent brain that psychologist Laurence Steinberg lays out in his new book, *Age of Opportunity: Lessons from the New Science of Adolescence*.

Steinberg teaches at Temple University. As an expert on adolescent development, his testimony has contributed to Supreme Court decisions abolishing the death penalty for juveniles and life without parole for juvenile offenders.

In *Age of Opportunity*, he argues that in the last decade, neuroscience has established that the brain remains "plastic," that is, changeable, well into the early 20s. His experiments have shown that adolescents respond differently to rewards, are more likely to take risks and are more sensitive to peers than adults. But he argues that our education, legal system, and our parenting have yet to incorporate these insights.

This book makes the case that for all the current focus on the growth that occurs between ages zero to three, ages 12 to 25 may be just as important for shaping the future of individuals and society.

I'm all in favor of high-quality preschool. But the way that it's discussed is that it's some kind of

inoculation.

In fact, for interventions that promote these non-cognitive skills, adolescence is just as good a time as early childhood.

By non-cognitive skills, you're talking about qualities known as "grit" — perseverance, self-motivation. But you say in the book that these are actually neither precisely "non-cognitive" nor precisely "skills."

I think it's a bad phrase. I think the experts agree about what they are, but they're better thought of as capacities that are cultivated than skills that are taught.

There isn't a single trait that's more important for success in the workplace than kids' self-control. We know that from many, many studies.

And what is it that happens in the teenage years that makes it such a critical, formative period for developing self-control?

As we know, experience can play a very important role in shaping the brain. Not only in the present but with respect to how kids are going to learn in the future.

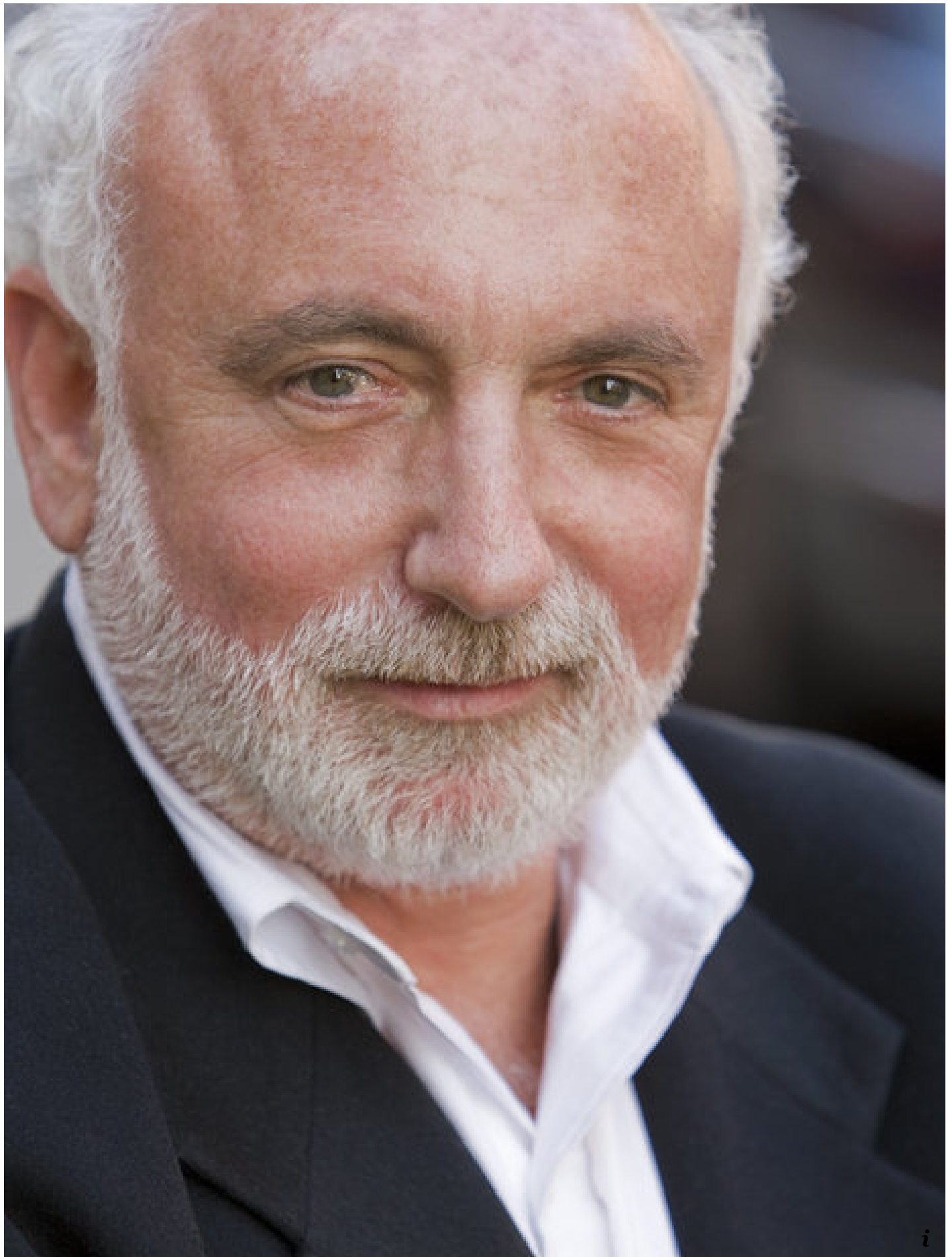
And I think that science suggests that it's important for kids to be challenged and exposed to novelty in order to facilitate healthy development of brain systems that are important for things like self-regulation.

You explain that adolescent brains are more sensitive to the "dopamine squirts" that come from rewards, be they sex, drugs, candy or money. This, combined with less-developed inhibition, is what makes them more likely to seek out challenges, novelty — in a word, risk.

We're hard-wired to be risk-takers as adolescents. The dark side of this is why societies from ours to ISIL recruit people this age to do the dirty work. [Young adults are] more interested in the immediate rewards than the long term consequences.

You say that so-called character education, abstinence education or drug education programs like DARE, haven't been shown to be effective. Because it's not that adolescents don't intellectually understand the impact of this behavior, it's that they are too compelled by the rewards.

Exactly. But the other side of this is, let's let kids satisfy those urges in pro-social ways. We want them to sign up for that course where they're not guaranteed to get As, to try out for the school play, or even ask that person out.



Axel Griesch Fotografie Tel. 004/Laurence Steinberg

How would you redesign high school to take advantage of current understanding of adolescent development?

First of all, I think we should think of high school as something that goes most of the day and doesn't stop at 3 p.m. We still run our school calendar and timetable as if we're an agrarian society in the beginning of the 20th century.

Give kids some choices: playing sports, arts, extra academic opportunities.

If kids are spending those hours unstructured and unsupervised, it's a recipe for experimenting with sex, drugs and delinquency. We know that kids are deterred when they're in settings with adults around.

The second thing I would do is to make high school more challenging. Now, for parents in the NPR audience, they're the ones who have kids in demanding schools. But there are far more high school graduates who need remediation than have ever taken a single AP class.

If we're talking about American education writ large, our schools are not very challenging. If only one in six students says she's ever taken a difficult class, this has more than just academic consequences. It's through challenge that kids develop things like determination and perseverance.

Any other changes you would make in high school?

I'd add some activities in the school day that research shows contribute to healthy brain development. For example, aerobic exercise, which is not part of the school day for a lot of kids. There have been schools that have had success with mindfulness training [meditation, yoga, tai chi].

And you say there may even be ways to explicitly teach qualities like self-control, empathy, and perseverance?

Most of the evidence for social-emotional learning programs comes from studies of kids with difficulties. It's a corrective. But I think there's no reason to think that it wouldn't work with kids who don't have behavioral problems.

Let's talk about peer pressure. Is it a myth?

We know that brain systems comprising the social brain are undergoing extensive

development during adolescence. They're particularly attentive to the behaviors of other people, and peers especially.

The studies we've done at Temple have been to understand why adolescents engage in more risk taking with peers than alone.

It's not so much that peers influence kids to take risks. It's that by activating their reward centers, peers make adolescents more sensitive to rewards in their immediate environment.

One example you use is that teen drivers are more likely to speed when they have teenage passengers.

Right, and this isn't true if they are riding with adults. But I think an important piece of our research has been misunderstood. Since peers activate the reward centers, there's plenty of reason to think that engaging in pro-social activity with their friends will make it more rewarding and desirable as well.

Like volunteer work? Or being on a sports team?

Yes. I think that for adolescents the presence of peers has a positive spillover regardless of what the activity is. So, in theory they should enjoy learning and other positive activities more if they're doing them with their friends.

So for this reason, you say that more group projects in high school might be a good idea.

Right. We often discourage group learning in school because we're very insistent in making sure we can assess individual levels of competency and mastery. But this may undermine students in some ways.

We often focus on the tough side of the teenage years — the idea that they're emotionally volatile ... drinking, smoking, acting up. And when people talk about "extended adolescence" or "delayed adulthood," that's usually thought of as a bad thing. But you have a different perspective.

There's this idea of meta-plasticity. That is the fact that the brain's degree of plasticity is itself a plastic characteristic of the brain. Certain experiences actually can increase the brain's plasticity, and they affect its capacity to be influenced in the future.

So the ability to keep learning, adapting and even experiencing the pleasures of youth, that's something we can and should cultivate and extend a little bit longer?

Well, there's got to be some ceiling. It wouldn't make evolutionary sense for the brain to be plastic forever. At some point you have to convert your brain portfolio from stocks to bonds. That's the shift from adolescence to adulthood.

But anything that keeps the brain plastic extends the period of being influenced by the environment. If you expose people to novelty and challenge, they're going to be able to learn and develop intellectually for a longer period.

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