

0068 Adolescent Brains Are Wired to Want Status and Respect: That's an Opportunity for Teachers and Parents

青少年的大脑天生想要地位和尊重：这对老师和家长来说是一个机会

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1. Adolescent Brains Are Wired to Want Status and Respect: That's an Opportunity for Teachers and Parents 青少年的大脑天生想要地位和尊重：这对老师和家长来说是一个机会

Here is a parable 寓言故事 for our time: There once was an adult /who wanted to encourage eighth graders 某某年级的学生 to eat healthier food. The adult designed a lesson plan /full of nutritional 营养的 information —why fruit and vegetables are good for you, why junk food is bad for you, and so on. A similar approach had worked with younger children. But the eighth graders declared (v.)宣布；宣告,宣称；断言 the intervention —and, if we're being honest, the adult —boring. They **carried on** 继续;开展; 参与 eating junk food, some of them /in greater quantities than they had before.

Example 1. 标题

有一个适合我们这个时代的寓言：曾经有一个成年人想鼓励八年级学生吃更健康的食物。这位成人设计了一个充满营养信息的课程计划——为什么水果和蔬菜对你有益，为什么垃圾食品对你有害，等等。类似的方法也适用于年幼的孩子。但八年级学生表示这种干预——而且，老实说，成年人——很无聊。他们继续吃垃圾食品，其中一些人吃的数量，比上课前的还要多。

With discouraging 使气馁 regularity 规律性；经常性, researchers find that / 主 what works with younger children 系 is no longer effective with adolescents 青少年. Eighth grade seems to be the inflection 语调的抑扬变化 point.

Thirteen-year-olds **are concerned with** status and respect —these kids do not want to feel patronized 屈尊俯就地对待；摆出高人一等的派头 by adults.

In a study published in 2019 in Nature Human Behaviour, instead of nutritional information, researchers **showed** more than 300 eighth graders in Texas investigative **reports** (n.) /revealing that food company executives 高管；主管；执行总监 use (v.) unhealthy ingredients (尤指烹调用的) 原料, target young adolescents in their marketing, and won't let their own children eat their products. The students were outraged 使震怒 /and began to **see** healthy eating **as** a way of taking a stand 站立 against being manipulated (暗中) 控制，操纵，影响.

For the next three months /the students made healthier snack 点心；小吃；快餐 purchases (n.) /in the cafeteria 自助餐厅；自助餐堂.

And in a follow-up study, the researchers found that /the students, especially boys, with higher levels of testosterone 睾酮；睾丸素 (a marker of **pubertal 青春期的；发育期的 maturation** 成熟过程；成熟 in both boys and girls) /were most likely to respond well to the intervention.

Example 2. 标题

令人沮丧的是，研究人员发现，对年幼儿童有效的方法对青少年不再有效。八年级似乎是一个转折点。

十三岁的孩子关心地位和尊重——这些孩子不想感受到成年人的居高临下。在 2019 年《自然人类行为》杂志上发表的一项研究中，研究人员向德克萨斯州 300 多名八年级学生展示了调查报告，而不是营养信息，这些报告显示食品公司高管使用不健康的成分，在营销中针对青少年，并且不让自己的孩子吃他们的产品。学生们感到愤怒，并开始将健康饮食视为反对被操纵的一种方式。在接下来的三个月里，学生们在食堂购买了更健康的零食。在一项后续研究中，研究人员发现，睾丸激素（男孩和女孩青春期成熟的标志）水平较高的学生，尤其是男孩，最有可能对干预措施做出良好反应。

Neuroscience 神经科学 has dramatically changed our understanding of the structural and functional changes in the brain during adolescence, which runs from around the age of 10 **all the way 一路上；从头到尾,一直到** into the mid-20s. It is a time of **rapid brain growth** and **neuronal 神经元的 fine-tuning 微调；细调** /when young people are especially sensitive to social cues and rewards.

Example 3. 标题

神经科学极大地改变了我们对青春期（从 10 岁左右一直到 20 多岁）大脑结构和功能变化的理解。这是大脑快速生长和神经元微调的时期，年轻人对社交暗示和奖励特别敏感。

A sensitive period for social and emotional processing /also suggests that /certain phases of adolescence **may be** more opportune 恰好的；适当的；恰当的 than others /for certain approaches 着手处理；对付. Early adolescence in particular —**from** roughly age nine **to** 11 —could be an opportunity /to launch 开始从事，发起，发动（尤指有组织的活动） kids **on a positive path** /by buttressing (v.)支持；给...以力量 their **sense of self** and **motivation to learn**.

主 To meaningfully compare (v.) the results of **which interventions work (v.) best** at age 10 or 14 or 18 谓 requires extensive 广泛的；广博的 **longitudinal 纵向的,经度的 studies**, which have not yet been done.

Example 4. 标题

longitudinal

(a.)concerning the development of sth **over a period of time** 纵向的

• **a longitudinal study** of aging 对衰老问题的纵向研究

社交和情感处理的敏感期也表明，青春期的某些阶段可能比其他阶段更适合采取某些方法。尤其是青春期早期——大约从 9 岁到 11 岁——可能是一个机会，通过增强孩子的自我意识和学习动力，让他们走上积极的道路。

要有意义地比较哪些干预措施在 10 岁、14 岁或 18 岁最有效，需要进行广泛的纵向研究，但目前尚未完成。

For decades /much of the research on adolescence **focused on** its dark side. Although those years are **the physically healthiest period** in life, when strength, speed, reaction time, **reasoning 推想；推理 abilities** and **immune function** 谓 all improve (v.) or peak (v.)达到高峰；达到最高值, adolescence also **brings (v.) alarming increases** in rates of accidents, suicide, homicide (蓄意) 杀人罪, depression, alcohol and **substance 物质；物品；东西 use**, violence, reckless behaviors, eating disorders, obesity 过度肥胖，肥胖症 and **sexually transmitted 传播；传染 disease /compared with** the rates for younger children.

Example 5. 标题

几十年来，大部分关于青春期的研究都集中在其阴暗面。尽管那些年生命中身体最健康的时期，力量、速度、反应时间、推理能力,和免疫功能,都得到改善或达到顶峰，但青春期也带来了事故、自杀、凶杀、抑郁、酗酒,和药物滥用的惊人增加，与年幼儿童相比，暴力、鲁莽行为、饮食失调、肥胖,和性传播疾

病的发生率更高。

Neuroscientists showed that /puberty (n.) 青春期 **ushers (v.) in** 开创；开始；开启 a period of exuberant 繁茂的；茂盛的；茁壮的 neuronal growth /followed by a pruning 修剪 (树木), 删减 of neural connections /that is second only to the similar process /that occurs in the first three years of life. They also showed that /the maturation of the adolescent brain /is not linear 线的；直线的；线状的. The **limbic 边的；缘的 system**, a collection of brain areas /that are sensitive to emotion, reward, novelty 新奇；新颖；新鲜, threat and peer 同龄人；同辈 expectations 期望；指望, undergoes (v.) 经历，经受（变化、不快的事等） a growth spurt (n.) （速度、干劲、活动或感情的）短时激增，迸发 /while 主 the brain areas 后定 **responsible for** reasoning, judgment and executive function 谓 continue (v.) their slow, steady march toward adulthood. 主 The resulting imbalance in the developmental forces / 谓 helps to explain adolescent impulsivity 冲动；冲动性, risk taking, and sensitivity to social reward and learning. **In** an evolutionary **sense** 意义；含义；理解...的方式；看待...的角度, 主 much of adolescents' behavior 谓 pushes them to leave the safety of family /to explore the larger social world — a step /**on the way** to becoming independent adults.

Example 6. 标题

usher /'ʌʃə(r)/

[VN+ adv./prep.] to take or show sb where they should go 把...引往；引导；引领

- The secretary ushered me into his office. 秘书把我领进他的办公室。

usher sth in

(formal) to be the beginning of sth new or to make sth new begin 开创；开始；开启

- The change of management ushered in fresh ideas and policies. 更换领导班子带来了新思想和新政策。

神经科学家表明，青春期迎来了神经元旺盛生长的时期，随后是神经连接的修剪，这种修剪仅次于生命前三年发生的类似过程。他们还表明，青少年大脑的成熟不是线性的。边缘系统是对情绪、奖励、新奇、威胁，和同伴期望敏感的大脑区域的集合，它经历了一个突飞猛进的成长，而负责推理、判断和执行功能的大脑区域，则继续缓慢、稳定地迈向成年。由此产生的发展力量的不平衡，有助于解释青少年的冲动、冒险，以及对社会奖励和学习的敏感性。从进化的角度来看，青少年的许多行为，促使他们离开家庭的安全，去探索更大的社会世界——这是成为独立成年人的一步。

Another line of research, from the human connectome project, shows that /adult brains vary (v.) in their patterns of neural connections throughout the brain, whereas children's connectomes are less distinctive 独特的；特别的；有特色的. Those differentiated 分化型；已分化的；可区分的 patterns of connection /emerge in adolescence —between the ages of 10 and 16, just when social values and cognition are developing quickly. And 主 the changes in the connectome (大脑中的)连接体 data 谓 **show up** 出现，露面 [on average] **a year to a year and a half**/earlier in girls than in boys, just like puberty 青春期 does, which suggests that /the two things are intertwined 使缠结，缠绕.

Example 7. 标题

人类连接组项目的另一项研究表明，成人大脑的神经连接模式各不相同，而儿童的连接组则不太独特。这些不同的联系模式，出现在青春期——10岁到16岁之间，此时社会价值观和认知，正在迅速发展。连接组数据的变化，在女孩中平均比男孩早一年到一年半出现，就像青春期一样，这表明这两件事是交织在一起的。

主 The idea /that adolescence might constitute (v.) (合法或正式地) 成立，设立 a sensitive period for social and emotional processing /谓 was put forward in 2014 /by neuroscientists Sarah-Jayne Blakemore and Kathryn Mills, now at the University of Cambridge and the University of Oregon, respectively 分别；各自；顺序为；依次为. Previous research had assumed that /主 **social-cognitive abilities** such as theory of mind 谓 were mature by the middle of childhood,

but Blakemore and Mills **laid out** 清晰地表达, 摆放 the many continuing changes (n.) /across adolescence in social cognition and the network of brain regions governing social behavior.

Example 8. 标题

2014 年, 分别就职于剑桥大学和俄勒冈大学的神经科学家 Sarah-Jayne Blakemore 和 Kathryn Mills, 提出了"青春期可能构成社交和情感处理敏感期"的观点。先前的研究假设, 心理理论等社会认知能力, 在童年中期就已经成熟, 但布莱克莫尔和米尔斯列出了"青春期社会认知和控制社会行为的大脑区域网络"的许多持续变化。

主 Sensitive, or critical, periods 系 are windows of time /when the brain is primed 待发的, 使准备好 to make specific neural connections /that depend on the input received. They **are timed (v.)** 为...安排时间; 选择...的时机 to when important information is available and most useful for development. For **sensory** 感觉的; 感官的 **processing** such as vision and hearing, such periods are well defined with an opening, peak and closing. 主 A brain 后定 **deprived** 剥夺; 使丧失; 使不能享有 of sight or sound early in development 谓 will never be able to see or hear normally. Likewise, 主 a sensitive period for language acquisition 谓 explains why 主 people who learn a foreign language after puberty 谓 typically have an accent. Sensitive periods for social learning have been harder **to pin down** 确定, 查明.

Example 9. 标题

敏感期或关键期, 是大脑准备根据接收到的输入, 建立特定神经连接的时间窗口。它们的时间安排, 在重要信息可用并且对开发最有力的时候。对于诸如视觉和听觉之类的感觉处理, 这些时期被明确定义为开始、峰值和结束。在发育早期被剥夺视觉或声音的大脑, 将永远无法正常看到或听到。同样, 语言习得的敏感期, 解释了为什么青春期后学习外语的人, 通常会有口音。社会学习的敏感期更难确定。

These windows of rapid change /create (v.) both learning opportunities and vulnerabilities. 主 What adolescents are learning 系 is all-important. “The adolescent brain is primed for social and emotional learning, to explore, to interact, to take chances /so they can learn, but it all depends on what we do /to give them **scaffolded 给.....搭脚手架；用支架支撑 opportunities** in order to learn,” says psychologist Andrew Fuligni of the University of California, Los Angeles. Harmful experiences may **lead to** negative spirals 螺旋形 /from which it’s hard to recover. Research has shown that /earlier experimentation with alcohol and drugs /**makes** an adolescent **more likely to become** addicted.

Example 10. 标题

这些快速变化的窗口既创造了学习机会，也创造了脆弱性。青少年正在学习的东西非常重要。“青少年的大脑已经做好了社交和情感学习、探索、互动、抓住机会的准备，以便他们能够学习，但这一切都取决于我们如何为他们提供学习的机会，”心理学家安德鲁·富利尼（Andrew Fuligni）说。加州大学洛杉矶分校。有害的经历可能会导致恶性循环，并且很难从中恢复。研究表明，较早尝试酒精和毒品会使青少年更容易上瘾。

Protective factors 保护性因素 in the adolescent’s environment /could support positive trajectories 轨迹；轨道线. What do protective factors look like? They include supportive relationships with family and caretakers 照看人；监护人；护理人员 /and access to resources such as scaffolded 脚手架 opportunities to learn in positive ways. They also include some elements /that have previously been underappreciated 未受到充分赏识的；未得到正确评价的.

Fuligni’s research shows that adolescents have a need to contribute to society, and 主 doing so 谓 makes them feel valued /and can safeguard (v.)保护；保障；捍卫 against anxiety and depression. “主 Part of what the brain is designed to do during the teenage years 系 is to learn how to contribute to the social world,” Fuligni says.

Example 11. 标题

青少年环境中的保护性因素可以支持积极的轨迹。保护因素是什么样的？其中包括与家人和看护者的支持性关系以及获得资源的机会，例如以积极方式学习的支架机会。它们还包括一些以前被低估的元素。富里尼的研究表明，青少年需要为社会做出贡献，这样做可以让他们感到受到重视，并可以预防焦虑和抑郁。“大脑在青少年时期的部分功能，就是学习如何为社会做出贡献，”富利尼说。

There is still debate about /how best to use the new neuroscientific knowledge to help adolescents. “We’ve learned an enormous amount about the brain, but 主 the application (尤指理论、发现等的) 应用，运用 of that knowledge 系 is not straightforward 简单的；易懂的；不复杂的,” Allen says.

Example 12. 标题

关于如何最好地利用新的神经科学知识来帮助青少年, 仍然存在争议。“我们已经了解了大量有关大脑的知识，但这些知识的应用并不简单，”艾伦说。

A big question is when to intervene. 主 One argument for **zeroing in on** 集中全部注意力于 early adolescence 系 is to act preemptively 先发制人地. Because so many of the problems of adolescence occur (v.) in the mid- to late teenage years, many interventions target (v.) that time. “If you’re a developmentalist 发展心理学倡导者；发展心理学专家, that is too late,”

They introduced Dahl 达尔 (人名) **to the idea of** the fifth grade slump (价格、价值、数量等) 骤降，猛跌，锐减；重重地坐下 (或倒下) and the eighth grade cliff, a phenomenon in which 主 children’s disengagement 脱离；分开 with education 谓 starts (v.) slowly /with a dip (通常指暂时的) 减少，下降，衰退 in grades 成绩等级；评分等级 /and participation around fifth grade, when most students are 10, and accelerates (v.) (使) 加速，加快 so /that those same students are failing three years later. “主 Smaller, more subtle, positive interventions earlier 系 are probably a much more promising way /to improve population health.”

Example 13. 标题

一个大问题是何时进行干预。关注青春期早期的一个论点是先发制人。由于青春期的许多问题发生在青少年中后期，因此许多干预措施都针对这一时期。

“如果你是一名发展主义者，那就太晚了，”“更小、更微妙、更早的积极干预，可能是改善人口健康的更有希望的方法。”

他们向达尔介绍了五年级衰退和八年级悬崖的概念，这是一种现象，儿童对教育的脱离开始缓慢，在五年级左右，当大多数学生10岁时，成绩和参与度下降，并加速，所以这些学生在三年后仍然不及格。

It is not surprising then that / 主 those interventions that look most promising 谓 **take into account** adolescents' desire for status and respect, as well as their need /to contribute and find a sense of purpose. According to Fuligni, 主 the most successful volunteer programs 谓 give adolescents **a say** in what to work on 从事，致力于 /**and a chance** to **reflect** 认真思考；沉思 **on** the work, and the projects also feel meaningful.

Meaning seems to matter (v.) in other efforts, too. In a study of early adolescents participating in a 4-H program, Burrow found that / 主 those who were asked to write about their sense of purpose /before **engaging in** (使) 从事，参加 an educational activity / 系 were more likely to **engage with** 与...建立密切关系；尽力理解 the activity /and find it important and interesting. “Purpose is a pretty powerful form of **identity capital** 身份资本 /because it's not just an answer to the question of who you are, but it's an answer to the question of who you're going to be /and the direction you're **heading in** 朝...走去，进入,” Burrow says. “It's got legs.”

Example 14. 标题

因此，毫不奇怪，那些看起来最有希望的干预措施，考虑到了青少年对地位和尊重的渴望，以及他们做出贡献和找到使命感的需要。富里尼表示，最成功的志愿者项目，让青少年对做什么工作有发言权，并有机会反思工作，而且这些项目也让人感觉很有意义。意义似乎在其他努力中也很重要。在一项针对参与 4-H

计划的早期青少年的研究中，Burrow 发现那些被要求在参与教育活动之前写下自己的目的感的人，更有可能参与该活动，并发现它重要且有趣。“目的是一种非常强大的身份资本形式，因为它不仅回答了你是谁的问题，而且回答了你将成为谁，以及你前进的方向的问题，”伯罗说。“它有腿。”

One series of experiments showed that / 主 the framing of a request to take medicine 谓 predicted (v.) different rates of compliance (n.)服从；顺从；遵从 /and that those rates **varied (v.) with** testosterone 睾酮；睾丸素 levels. Some 18- and 19-year-olds came into the lab /and were given instructions in a condescending 表现出优越感的；居高临下的 way: I'm the expert, I know what's good for you, take this. Another group of young adults were given instructions /in a more respectful manner: Let me explain the reasons this medicine can be useful.

Example 15. 标题

一系列实验表明，服药请求的框架可以预测不同的依从率，并且这些比率随睾酮水平的不同而变化。一些18岁和19岁的人走进实验室，并以一种居高临下的方式得到指示：我是专家，我知道什么对你有好处，拿着这个。另一组年轻人以更加尊重的方式接受指示：让我解释一下这种药有用的原因。

For ethical (有关)道德的；伦理的 reasons, the medicine in question was actually a spoonful of Vegemite 维吉米特黑酱(用酵母制成，涂于面包等上), a notoriously 众所周知地，声名狼藉地 strong-tasting condiment 调味品；佐料. Asked respectfully, people were twice as likely to take the Vegemite. Furthermore, 主 participants with higher testosterone 睾酮，睾丸素 levels 系 were significantly less likely to take the medicine in the disrespectful condition /and more likely to comply [in the respectful condition]. When Yeager and his colleagues manipulated testosterone levels /with a nasal 鼻的；与鼻子相关的 inhaler 吸入器(吸药用), they found that / 主 doing so 谓 **made** individuals with naturally low testosterone levels **behave (v.) just like** those with naturally high testosterone levels.

Example 16. 标题

出于道德原因，有问题的药物实际上是一勺 Vegemite，一种臭名昭著的味道浓烈的调味品。如果恭敬地询问，人们服用 Vegemite 的可能性是其他人的两倍。此外，睾酮激素水平较高的参与者，在不被人尊重的情况下，服用药物的可能性显著降低，而在尊重的情况下更有可能遵守。当耶格尔和他的同事用鼻吸入器控制睾酮水平时，他们发现这样做会使睾酮水平自然较低的人，表现得与睾酮水平自然高的人一样。

2. Adolescent Brains Are Wired to Want Status and Respect: That's an Opportunity for Teachers and Parents

Here is a parable for our time: There once was an adult who wanted to encourage eighth graders to eat healthier food. The adult designed a lesson plan full of nutritional information—why fruit and vegetables are good for you, why junk food is bad for you, and so on. A similar approach had worked with younger children. But the eighth graders declared the intervention—and, if we're being honest, the adult—boring. They carried on eating junk food, some of them in greater quantities than they had before.

With discouraging regularity, researchers find that what works with younger children is no longer effective with adolescents. Eighth grade seems to be the inflection point.

Thirteen-year-olds are concerned with status and respect—these kids do not want to feel patronized by adults. In a study published in 2019 in *Nature Human Behaviour*, instead of nutritional information, researchers showed more than 300 eighth graders in Texas investigative reports revealing that food company executives use unhealthy ingredients, target young adolescents in their marketing, and won't let their own children eat their products. The students were outraged and began to see healthy eating as a way of taking a stand against being manipulated. For the next three months the students made

healthier snack purchases in the cafeteria. And in a follow-up study, the researchers found that the students, especially boys, with higher levels of testosterone (a marker of pubertal maturation in both boys and girls) were most likely to respond well to the intervention.

Neuroscience has dramatically changed our understanding of the structural and functional changes in the brain during adolescence, which runs from around the age of 10 all the way into the mid-20s. It is a time of rapid brain growth and neuronal fine-tuning when young people are especially sensitive to social cues and rewards.

A sensitive period for social and emotional processing also suggests that certain phases of adolescence may be more opportune than others for certain approaches. Early adolescence in particular—from roughly age nine to 11—could be an opportunity to launch kids on a positive path by buttressing their sense of self and motivation to learn.

To meaningfully compare the results of which interventions work best at age 10 or 14 or 18 requires extensive longitudinal studies, which have not yet been done.

For decades much of the research on adolescence focused on its dark side. Although those years are the physically healthiest period in life, when strength, speed, reaction time, reasoning abilities and immune function all improve or peak, adolescence also brings alarming increases in rates of accidents, suicide, homicide, depression, alcohol and substance use, violence, reckless behaviors, eating disorders, obesity and sexually transmitted disease compared with the rates for younger children.

Neuroscientists showed that puberty ushers in a period of exuberant neuronal growth followed by a pruning of neural connections that is second only to the similar process that occurs in the first three years of life. They also showed that the maturation of the adolescent brain is not linear. The limbic system, a collection of brain areas that are sensitive to emotion, reward, novelty, threat and peer expectations, undergoes a growth spurt while the brain areas responsible for reasoning, judgment and executive function continue their

slow, steady march toward adulthood. The resulting imbalance in the developmental forces helps to explain adolescent impulsivity, risk taking, and sensitivity to social reward and learning. In an evolutionary sense, much of adolescents' behavior pushes them to leave the safety of family to explore the larger social world—a step on the way to becoming independent adults. Another line of research, from the human connectome project, shows that adult brains vary in their patterns of neural connections throughout the brain, whereas children's connectomes are less distinctive. Those differentiated patterns of connection emerge in adolescence—between the ages of 10 and 16, just when social values and cognition are developing quickly. And the changes in the connectome data show up on average a year to a year and a half earlier in girls than in boys, just like puberty does, which suggests that the two things are intertwined.

The idea that adolescence might constitute a sensitive period for social and emotional processing was put forward in 2014 by neuroscientists Sarah-Jayne Blakemore and Kathryn Mills, now at the University of Cambridge and the University of Oregon, respectively. Previous research had assumed that social-cognitive abilities such as theory of mind were mature by the middle of childhood, but Blakemore and Mills laid out the many continuing changes across adolescence in social cognition and the network of brain regions governing social behavior.

Sensitive, or critical, periods are windows of time when the brain is primed to make specific neural connections that depend on the input received. They are timed to when important information is available and most useful for development. For sensory processing such as vision and hearing, such periods are well defined with an opening, peak and closing. A brain deprived of sight or sound early in development will never be able to see or hear normally. Likewise, a sensitive period for language acquisition explains why people who learn a foreign language after puberty typically have an accent. Sensitive periods for social learning have been harder to pin down.

These windows of rapid change create both learning opportunities and vulnerabilities. What adolescents are learning is all-important. “The adolescent brain is primed for social and emotional learning, to explore, to interact, to take chances so they can learn, but it all depends on what we do to give them scaffolded opportunities in order to learn,” says psychologist Andrew Fuligni of the University of California, Los Angeles. Harmful experiences may lead to negative spirals from which it’s hard to recover. Research has shown that earlier experimentation with alcohol and drugs makes an adolescent more likely to become addicted.

Protective factors in the adolescent’s environment could support positive trajectories. What do protective factors look like? They include supportive relationships with family and caretakers and access to resources such as scaffolded opportunities to learn in positive ways. They also include some elements that have previously been underappreciated. Fuligni’s research shows that adolescents have a need to contribute to society, and doing so makes them feel valued and can safeguard against anxiety and depression. “Part of what the brain is designed to do during the teenage years is to learn how to contribute to the social world,” Fuligni says.

There is still debate about how best to use the new neuroscientific knowledge to help adolescents. “We’ve learned an enormous amount about the brain, but the application of that knowledge is not straightforward,” Allen says.

They introduced Dahl to the idea of the fifth grade slump and the eighth grade cliff, a phenomenon in which children’s disengagement with education starts slowly with a dip in grades and participation around fifth grade, when most students are 10, and accelerates so that those same students are failing three years later. “Smaller, more subtle, positive interventions earlier are probably a much more promising way to improve population health.”

It is not surprising then that those interventions that look most promising take into account adolescents’ desire for status and respect, as well as their need to contribute and find a sense of purpose. According to Fuligni, the most successful volunteer programs give adolescents a say in what to work on and a

chance to reflect on the work, and the projects also feel meaningful. Meaning seems to matter in other efforts, too. In a study of early adolescents participating in a 4-H program, Burrow found that those who were asked to write about their sense of purpose before engaging in an educational activity were more likely to engage with the activity and find it important and interesting. “Purpose is a pretty powerful form of identity capital because it’s not just an answer to the question of who you are, but it’s an answer to the question of who you’re going to be and the direction you’re heading in,” Burrow says. “It’s got legs.”

One series of experiments showed that the framing of a request to take medicine predicted different rates of compliance and that those rates varied with testosterone levels. Some 18- and 19-year-olds came into the lab and were given instructions in a condescending way: I’m the expert, I know what’s good for you, take this. Another group of young adults were given instructions in a more respectful manner: Let me explain the reasons this medicine can be useful.

For ethical reasons, the medicine in question was actually a spoonful of Vegemite, a notoriously strong-tasting condiment. Asked respectfully, people were twice as likely to take the Vegemite. Furthermore, participants with higher testosterone levels were significantly less likely to take the medicine in the disrespectful condition and more likely to comply in the respectful condition. When Yeager and his colleagues manipulated testosterone levels with a nasal inhaler, they found that doing so made individuals with naturally low testosterone levels behave just like those with naturally high testosterone levels.