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## No Brakes! Risk and the adolescent brain.

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It's often said that adolescents are fearless and see themselves as invulnerable, that they're irrational in how they reason and process information, that they act with no logical basis for their decisions and don't really understand risk. This is all a little true, but only to the extent that it's true of everybody. People of all ages are bad at assessing risk and making rational decisions. People of all ages underestimate likely dangers and overestimate unlikely ones.

A series of recent studies has demonstrated that the level of irrationality among adolescents and adults is about the same, which means that we can no longer explain the risky behavior of teenagers by telling ourselves that adolescents suffer from some special inability to reason.

These studies also encourage us to reconsider the notion that adolescents just make uniquely bad choices, and the corollary assumption that if we just *tell* them how to make better choices they will do so.

There are powerful forces—such as the brain's reaction to the presence of peers as a potent prompt and reward for sensation-seeking—that can move an adolescent to select risky behavior as the "right" choice. Urging kids to "Just Say No" to drugs, for instance, has been ineffective because it misses key factors leading to drug use. A given young person might say "No" when he or she is alone, but not when surrounded by peers. In fact, opting to say "Yes!" to drugs at a party—in a situation replete with the novel sensation and peer influence that light up the early adolescent brain like a Christmas tree—makes perfect sense because it maximizes rewards.

Interventions based on these erroneous assumptions are not likely to help much.

They include:

### **1. Reasoning with your child**

We've written before about the relative ineffectiveness of reasoned argument as a way to change behavior. The potential positive long-term effects of explanation do not make it an effective short-term intervention that will stop your early-adolescent child from going out and doing something risky tomorrow.

### **2. Educational programs in the schools**

Current research now suggests that attempts to make adolescents less impulsive, less shortsighted, and more aware of consequences have very weak effects, if any, on behavior. That doesn't mean the programs are worthless. Some tiny number of students will be influenced by them in the short run, and in the long run they're likely to provide tools that a maturing young person can take up when the further development of the cognitive-control system has brought him to the point that he's ready to use them.

### **3. Pledges not to engage in risky behavior**

One common intervention especially beloved by moral crusaders and supported by government funds asks teenagers to formally promise not to engage in behaviors that place them at risk. As far as we can tell, it doesn't work, and occasionally it makes things worse. As an ancillary but not irrelevant finding, five years after taking the virginity pledge 82 percent of the pledgers denied having ever pledged.

Larry Steinberg of Temple University has described the early-adolescent brain as being like a car with a very responsive accelerator and weak brakes. Steinberg and others have put two brain systems under particular scrutiny in recent years.

### **Gas Pedal**

The first, Steinberg's gas pedal, is the social-emotional system. About the time of the onset of puberty, changes in brain structure and function, hormones, and neurotransmitters work together to increase the desire to seek out rewarding experiences, especially the sensation afforded by novel and risky behavior. The effect of brain function is also conditioned by the social environment. Various lab experiments, including video driving games and gambling games, show that adolescents take more risks if peers are present or evaluating their

Name \_\_\_\_\_

performance. As the social-emotional system undergoes robust development in early adolescence, the brain gets better at guiding behavior toward sensation and reward—flooring it, in other words. But Steinberg's brakes don't kick in until a little later.

**Brakes**

The brakes take the form of the cognitive-control system, which constitutes an individual's capacity for self-regulation, including inhibition, planning, weighing consequences and risks and rewards, and abstract thinking. This system develops later than the social-emotional system, a process continuing well into late adolescence and early adulthood. The cognitive-control system connects—literally—with parts of the brain that control emotions.

As the cognitive-control system begins to develop in middle and late adolescence, thought and emotion are better coordinated, and emotions are held more in check. An adolescent's sheer ability to reason may already match an adult's, but the development of this system allows that ability to exercise greater practical control over risky impulses.

**Conclusion**

The result is that risk-taking increases significantly with the onset of puberty, peaks somewhere in the middle of the decade between ages 10 and 20, and then declines and stabilizes in late adolescence and young adulthood. And, while in early adolescence antisocial and risky behavior is more likely to be done in groups, in late adolescence, such behaviors, to the extent they occur at all, are more likely to be performed by individuals acting alone. It makes sense, then, that age 16 is the peak year for deaths by car accident: The age at which most novice drivers can first get their licenses coincides with the tail end of the peak of sensation-seeking and risky behavior.

**NO BRAKES! QUESTIONS**

1. What are 2 “powerful forces” on the teenage brain?
2. What 3 things don't work to change adolescent behavior?
3. What is the gas pedal and when does this develop?
4. What system constitutes the brakes and when does this develop?
5. At what age approximately, does risk-taking peak? Based on this, when might be the best time to allow kids to drive?

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