



## Adolescents and Risk: Helping Young People Make Better Choices

Insights for parents, teachers, and educators featuring research by [Dr. Valerie Reyna](#), Professor of Human Development and Psychology at Cornell University, and Co-Director of the Center for Behavioral Economics and Decision Research.

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Adolescence, as every teenager, parent, and youth professional knows, is a time of risks. With greater freedom and independence, young people face new choices involving automobiles, addictive substances, and sexuality—frequently in combination. Poor choices about these risks can have terrible consequences for individuals, families, and society as a whole.

The statistics are frightening, but they are not unknown to young people. For decades, adolescents have been bombarded by facts about the risks they face. Yet efforts to scare young decision makers with numbers and percentages have met with limited success (Reyna & Farley, 2006). There is even evidence that some risk-awareness-raising programs, such as DARE, actually increase the behaviors they are designed to prevent (see Lilienfeld, 2007). To reduce adolescent risk taking, a different approach is needed: one that recognizes how adolescents reason.

### The Immortality Myth

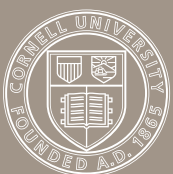
We've all heard the cliché that young people think they are immortal and invulnerable to harm. This cherished assumption about the adolescent mind is expressed as a truism in countless public health messages aimed at parents of teens, and underlies many efforts to educate young people about their risks. The problem is, it's not true.



*"To reduce adolescent risk taking, a different approach is needed: one that recognizes how adolescents reason."*

A growing body of scientific data shows that young people are actually well aware of their vulnerability. Adolescents estimate some of their risks, such as the odds of becoming a mother by age 20, quite accurately (Fischhoff et al., 2000); and they actually *overestimate* their risks for negative outcomes like contracting HIV and other STDs, getting lung cancer, and suffering adverse consequences of drinking alcohol (Reyna & Adam, 2003; Romer & Jamieson, 2001). Although young individuals do sometimes display an optimistic bias—that is, thinking they are at

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less risk than their peers—adults display the same fallacy in their thinking, so this does not explain why adolescents take risks that adults avoid (Reyna & Farley, 2006).

Dr. Valerie Reyna and her colleagues at Cornell University and elsewhere have studied patterns of reasoning in children, adolescents, and adults, and they have reached a startling, highly counterintuitive conclusion about the reasons for adolescent risk taking: Young people take risks not because of a belief that they are invulnerable, but because they engage in too much rational calculation when making choices.

Even if they know the risks they run, adolescents mentally weigh those risks against perceived benefits. When risks are engaged in “only once or twice,” the odds may appear favorable (Reyna & Farley, 2006). Adults, in contrast, tend to “go with their gut”—they don’t proceed down the slippery slope of trading off serious risks (such as dying in a car accident) against immediate rewards (such as approval of peers), and their choices are better as a result.

### The Science of Risky Decisions

Psychologists now believe that the brain encodes, stores, and retrieves representations of our experiences in two very different ways, involving separate brain areas and distinct mental processes (see Reyna, 2004). Any decision involving risk may use either or both of these separate forms of processing.

According to “fuzzy-trace theory,” developed by Reyna and her colleague Dr. Charles Brainerd (Reyna & Brainerd, 1991; see also Reyna, 2004; Reyna & Farley, 2006), one of these dual paths to processing risk judgments is highly deliberative and oriented toward facts and details. This is the type of thinking that corresponds to classical, logical models of economic decision making—the rational balancing of benefits against costs. And it is the type of reasoning that children and adolescents rely on most when making choices (Reyna, Adam, Poirier, LeCroy, & Brainerd, 2005).

The other route to making risk judgments tends to ignore details and focuses instead on the overall meaning or gist of a situation (Reyna & Kiernan, 1994). This form of thinking is more intuitive, and relies more on emotional reactions and situational cues than on deliberative calculation. It is also more categorical—seeing things in terms of black and white instead of shades of gray. With greater age and life experience, people increasingly utilize this second, “gist-based” path to making decisions (Reyna, 2004).

The tendency toward gist-based reasoning also characterizes relatively expert decision makers in skilled fields such as medicine. Physicians with more experience don’t focus on the details of a case but follow their informed intuitions, and they are more often correct than their less experienced colleagues (Reyna & Lloyd, 2006). (Informed intuition, which is what experts have, is not the same thing as naïve intuition.) The bottom line: intuitive, gist-based reasoning leads to better and more effective decisions in all walks of life. Not only is it good to think with your gut, it’s also more mature.

### The Adolescent Brain

Consider a typical scenario: an adolescent alone in the house with her boyfriend thinks about whether to have unprotected sex with him. To her rational adolescent mind, educated in the facts and deliberating on the odds, it may seem like a good bet. There is only a modest chance of becoming pregnant or catching an STD from a single encounter, and the perceived benefits—particularly in the heat of the moment, or under the influence of alcohol—may seem to outweigh the risks.

In contrast, an adult faced with the temptation of unprotected sex would be more likely to skip the deliberation and go to the main point: the risks of disease (or death, in the case of HIV), or of an unwanted pregnancy, are just not worth quantifying and cannot be weighed against immediate rewards like brief pleasure or social approval. In other words, the grown-up brain quickly grasps the gist of the situation: nothing is worth risking one’s health or future happiness.

The trouble is, getting young brains to compute a quick and categorical “no” rather than weigh the odds is not easy. In a recent study, people of different ages were asked to respond quickly to easy, risk-related questions like “Is it a good idea to set your hair on fire?” and “Is it a good idea to swim with sharks?” (Baird & Fugelsang, 2004). Adolescents took about a sixth of a second longer than adults to get to the obvious “no.” A sixth of a second may not seem like a lot, but it reflects a major difference between the brains of adolescents and adults.

The brain areas that quickly grasp the gist of situations and regulate judgments (specifically, the dorsolateral and ventromedial parts of the frontal lobe) are still developing during the teenage years, and don’t reach full maturity until the early to mid twenties for most people (see Reyna and Farley, 2006). The adolescent brain just isn’t yet optimized for making that adult beeline to the bottom line.

## Intervention Strategies

The science of adolescent risk taking leads to two broad conclusions for designing interventions. First, bombarding youth with the facts won't help them make better decisions, and may actually encourage a less mature, riskier form of reasoning. Interventions should instead encourage less deliberative, more categorical thinking about risk. Second, because adolescents' brains are not yet mature, exposure to major risks should be limited as much as possible.

The safety of young people is a community concern, not solely a matter of individual choice. However, interventions that help young people learn to make better choices can be an effective component of a larger commitment to youth development and healthy communities. The following strategies can be used by parents, youth professionals, and communities to keep young people safe and help them make better choices (see Reyna & Farley, 2006):

- **Don't assume that adolescents think they are immortal—they don't!** Research clearly shows that young people are well aware that they live in a world full of perils.
- **Help adolescents see *benefits* differently, not just risks.** Risks will have less appeal if young people perceive greater benefit from alternative, safer courses of action. For younger adolescents, highlight *short-term* benefits and risks, as these are the most salient.
- **Use positive images or models of healthy behaviors and negative images of unhealthy ones.** Positive, emotionally evocative images—such as those in the media, films, or fiction—can assist gist-based thinking and serve as reminders of the benefits of safer behavior.
- **Use analogies to steer adolescents away from deliberative calculation toward more categorical thinking about risk.** To help young people see that no possible payoff of risky behavior is worth risking death, ask questions like “Would you play Russian Roulette for one million dollars?”
- **Develop emotional and personal cues.** The most salient cues to making mature decisions are simple, visceral, and personal. A sexual health intervention could personalize risk by having young people write answers to questions like “What would happen if you were diagnosed with HIV? Who would you tell? How would it change your life?”

- **Give adolescents practice at recognizing environmental signs of danger.** Teach kids about “red and yellow alerts” that indicate the possibility of various risks—for example, being at home after school with a boyfriend or girlfriend (and no parents or other adults) as a signal of the possibility of unwanted or unsafe sex. Have them practice finding such alerts in various scenarios so that they can avoid such risks and, if the risks cannot be avoided, thinking through actions they could use to extricate themselves.
- **Teach self-efficacy; provide opportunities to practice concrete skills.** Giving young people real-world tasks and concrete strategies helps them become responsible and capable. For example, young teens who are not ready for sex can practice refusal skills; repeated practice leads to better self-confidence in using these skills when they are needed, often in situations involving high emotion that can disrupt thinking. A well-practiced skill can be used automatically, without requiring a lot of thinking.
- **Limit adolescents' exposure to risky substances and situations.** For example, limit the number of peers in automobiles; avoid exposing minors to addictive substances (rather than exposing young people to alcohol to teach them to drink responsibly, which has been shown to be ineffective and in fact is associated with higher rates of binge drinking and other bad outcomes; Grube, 2005).
- **Monitor and supervise younger adolescents.** Rather than rely on reasoned choices, remove younger teens' opportunity to engage in risk taking by occupying their time with positive activities.
- **Train young people in strategies to help them avoid dangerous situations.** Teach youth to avoid circumstances in which they will need to make an immediate, risky choice—for instance, encourage them to stay away from situations where alcohol and drugs may be present.

## Learn More

Resources on Risky Decision Making in Adolescents:

[http://www.human.cornell.edu/hd/Outreach\\_extension/risky-decision-making-in-adolescents.cfm](http://www.human.cornell.edu/hd/Outreach_extension/risky-decision-making-in-adolescents.cfm)

## References

- Baird, A. A., & Fugelsang, J. A. (2004). The emergence of consequential thought: Evidence from neuroscience. *Philosophical Transactions of the Royal Society of London, Series B: Biological Sciences*, 359, 1797–1804.
- Fischhoff, B., Parker, A. M., Bruine de Bruin, W., Downs, J., Palmgren, C., Dawes, R., & Manski, C. F. (2000). Teen expectations for significant life events. *Public Opinion Quarterly*, 64, 189–205.
- Grube, J. (2005, May). *Youth drinking rates and problems: A comparison of European countries and the United States*. Washington, DC: U.S. Department of Justice, Office of Justice Programs, Office of Juvenile Justice and Delinquency Prevention.
- Lilienfeld, S. O. (2007). Psychological treatments that cause harm. *Perspectives on Psychological Science*, 2, 53–70.
- Reyna, V. F. (2004). How people make decisions that involve risk. A dual-processes approach. *Current Directions in Psychological Science*, 13, 60–66.
- Reyna, V. F., & Adam, M. B. (2003). Fuzzy-trace theory, risk communication, and product labeling in sexually transmitted diseases. *Risk Analysis*, 23, 325–342.
- Reyna, V. F., Adam, M. B., Poirier, K., LeCroy, C. W., & Brainerd, C. J. (2005). Risky decision-making in childhood and adolescence: A fuzzy-trace theory approach. In J. Jacobs & P. Klaczynski (Eds.), *The development of judgment and decision-making in children and adolescents* (pp. 77–106). Mahwah, NJ: Erlbaum.
- Reyna, V. F., & Brainerd, C. J. (1991). Fuzzy-trace theory and framing effects in choice: Gist extraction, truncation, and conversion. *Journal of Behavioral Decision Making*, 4, 249–262.
- Reyna, V. F., & Farley, F. (2006). Risk and rationality in adolescent decision making: Implications for theory, practice, and public policy. *Psychological Science in the Public Interest*, 7, 1–44.
- Reyna, V. F., & Kiernan, B. (1994). The development of gist versus verbatim memory in sentence recognition: Effects of lexical familiarity, semantic content, encoding instruction, and retention interval. *Developmental Psychology*, 30, 178–191.
- Reyna, V. F., & Lloyd, F. (2006). Physician decision making and cardiac risk: Effects of knowledge, risk perception, risk tolerance, and fuzzy processing. *Journal of Experimental Psychology: Applied*, 12, 179–195.
- Romer, D., & Jamieson, P. (2001). Do adolescents appreciate the risks of smoking? Evidence from a national survey. *Journal of Adolescent Health*, 29, 12–21.

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