

SCIENCE SPOTLIGHT

## What Is Unique About Adolescent Decision-Making — And How We Can Support It

**A**dolescence, the years between 10 and 25, is a period of profound psychological, social, and brain development. Physical changes during these years are happening at the same time as changes to our social world, as we take on new responsibilities, gain new agency in our lives, and navigate evolving relationships with our families and peers. The brain development that occurs during adolescence helps prepare us for adulthood by prompting us to explore, take risks, and learn about the world around us. All of these developmental processes combine to make adolescence a time of remarkable opportunity.

Some of the most profound changes that take place during adolescence occur within brain systems that support decision-making—the process of evaluating options and choosing actions based on our values and goals. Understanding how our decision-making skills develop during adolescence and how and when adolescent decision-making differs from that of adults can help us create and improve policies and practices that support healthy development into adulthood.

### **BRAIN SYSTEMS THAT SUPPORT DECISION-MAKING CONTINUE TO DEVELOP THROUGHOUT ADOLESCENCE**

During adolescence, our brain’s “reward circuitry”—specialized brain systems that enable us to predict, respond to, and seek out rewarding experiences—undergoes significant changes.<sup>1</sup> Increased activity in response to stimuli in these systems motivates us to seek out new experiences, especially ones that have the potential to be exciting or enjoyable. This increased motivation to explore is generally beneficial to our learning: seeking out new experiences provides an opportunity to learn from novel situations and become better prepared to handle similar situations in the future. We are particularly skilled at learning from experience during adolescence, especially from trial and error.<sup>2</sup> This is, in part, because we are highly attuned not only to rewarding but also unexpected outcomes of our actions.<sup>3</sup> This heightened attention to new information and unanticipated or surprising results from our actions helps us learn from the outcomes of our choices and adjust our behavior accordingly, making us expert learners during this stage of life.

New experiences prompt our brain cells (called “neurons”) to connect with other neurons in ways that help us use what we learn to inform and guide our future decisions.

These connections between neurons become stronger the more we use them, while unused connections are pruned away. This natural developmental process creates more streamlined pathways between brain regions that help us become more efficient at acquiring and mastering new skills and new ways of thinking.

In particular, connections between our prefrontal cortex—a region of the brain that helps us make decisions, plan for the future, and regulate our emotions—and regions deep within the brain that are sensitive to rewarding feelings change and mature in response to our experiences.<sup>4</sup>

These maturing connections allow us to more effectively regulate our emotions, control our impulses, and align our behaviors with our long-term goals—all skills that we continue to refine during adolescence. Together, the development of these systems helps us build our decision-making skills.



## RISKY DECISION-MAKING DURING ADOLESCENCE DEPENDS ON CONTEXT

In many contexts, adolescent decision-making looks quite similar to adult decision-making. However, different scenarios require different skills, and certain types of situations can amplify differences in decision-making between adolescents and adults. In particular, many studies have examined differences in how youth and adults make decisions that involve some degree of risk—that is, making choices without knowing for certain what the outcome will be.

Although increased sensitivity to potential rewards makes us expert learners during adolescence, this same developmental asset can also motivate us to make impulsive or risky decisions, particularly in stressful situations, in the presence of peers, and in ambiguous situations where potential outcomes are highly uncertain. Importantly, taking risks to make decisions when we don't know the outcome is an important part of healthy development. While some risky decisions can be harmful, deciding to take a risk to try out a new activity, apply for a job, or ask someone out can help us learn about ourselves and the world.

Research points to three important contexts in which young people, on average, make riskier decisions than adults.

### Time-pressured and stressful situations

Regulating our emotions and making optimal decisions under stress is a difficult task at any age. However, research suggests that the negative effects of stress on decision-making can be amplified when we are adolescents.<sup>5</sup> This is in part because the networks within our brain that help us to regulate our emotions, manage stress, and make informed decisions continue to develop and strengthen in response to our experiences well into our 20s.<sup>6</sup> As a result, adolescents may behave more impulsively than adults in certain stressful or emotional contexts

Research finds that stress can lead to more impulsive decisions with a higher likelihood of a negative

outcome when adolescents are not given sufficient time to make a decision. For instance, one study measured how well adolescents and adults performed on a cognitive control task that required them to quickly press a button every time they saw a letter on the screen *unless* it was the letter 'X'. The researchers found that adolescents were just as good as adults at inhibiting their impulses to click on 'X' when their stress levels were low. However, when youth were experiencing higher stress in their daily lives, they were significantly worse than adults at suppressing their impulsive responses to click 'X,' leading to worse performance in the task.<sup>7</sup> Notably, participants in the study were given very little time (only one second) to make a decision.



Taken together, this research suggests it is important to consider how stress may shape decision-making in circumstances where an adolescent has little or no time to consider options or consequences.

In addition to research highlighting how in-the-moment and daily stressors shape adolescent behavior, there is also evidence that prolonged, chronic stressors have lasting impacts on behavior across development. Adverse childhood experiences including trauma, neglect, unpredictable caregiving, and poverty can affect how we weigh risks and make decisions.<sup>8</sup> The impact of early adversity on decision-making can be complex, leading some young people to be more risk-averse and others to show more impulsivity. Supportive relationships and research-based interventions can be particularly effective in promoting long-term healthy outcomes for adolescents, [including those who have experienced adversity](#).

## Decisions made in the presence of peers

During adolescence, we begin to spend more time with our peers and increasingly look to them for support. Being around our peers can amplify our motivation to seek out rewarding experiences, which can lead us to make riskier decisions than we would usually make. Particularly around middle adolescence (about 14 to 18 years old), there is more activity in our brain’s reward circuitry while taking risks when we are in the presence of peers compared to when we are alone. This can lead to riskier, and sometimes more dangerous, choices.<sup>9</sup> In many situations, our peers can improve our decision-



making by helping us to regulate our emotions<sup>10</sup> or motivating us to make more positive, healthy decisions to try something new, such as

volunteering for community service projects<sup>11</sup> and donating money to others.<sup>12</sup>

## Decisions made in ambiguous situations

Many decisions involve a bit of uncertainty: choosing a college without knowing who we will meet or what we want to major in, deciding to take a new job without knowing how well we are going to get along with our future coworkers, or deciding to go on a date with someone new without knowing if we will have anything to talk about. For many people, dealing with uncertainty when making decisions can be stressful. Research finds that during adolescence, we view this ambiguity more favorably than we do at other stages of life.

One study examined how adolescents (aged 12 to 17) and adults (aged 30 to 50) make decisions about risk in a gambling game.<sup>13</sup> When they were told the exact probability of winning, adolescents were actually *less* likely than adults to make the risky decision to take the gamble. However, when the probability of winning the gamble was hidden—that is, when there was more uncertainty—adolescents were significantly more likely

than adults to take the risk. These findings suggest that heightened risk-taking during adolescence partly stems from a greater willingness to tolerate ambiguous situations and to predict a positive outcome when the outcome is unknown. In real-world scenarios, this may mean that informing young people about real risks and benefits could help them to take fewer negative risks.

Given that adolescents have less life experience than adults, they may more frequently come across unfamiliar scenarios in which the outcomes of their actions are uncertain.<sup>14</sup>

This inexperience, coupled with a greater motivation to seek rewards and a tendency to assess ambiguous risks more optimistically, may lead adolescents to take more risks than adults.



The tendency to be more tolerant of ambiguity can motivate us to explore and experience novel situations, such as meeting new people, trying a new activity, or, in later adolescence, moving to a new city—experiences that involve risk but help us learn about the world and develop into independent adults.

## ADOLESCENTS MAKE SIMILAR DECISIONS TO ADULTS WHEN GIVEN TIME TO DELIBERATE AND CONSIDER THEIR OPTIONS

Research suggests adolescents are more likely to make impulsive decisions when they are faced with time pressure or in emotionally charged contexts. However, when young people are given time to deliberate and consider their options, studies find that they make logical, well-informed decisions similar to adults, often opting not to take the risk.<sup>15</sup> In fact, research suggests that the cognitive abilities that enable us to think logically and rationally reach adult levels around age sixteen.<sup>16</sup> These patterns have been observed in adolescents living in different countries around the world, suggesting that the ability to make well-informed, deliberative decisions by middle adolescence is a feature of this developmental period across different cultures and economies.<sup>17</sup> Together, this suggests that by around middle adolescence, youth are as adept as adults at making sound decisions in situations that allow time for deliberation, such as voting, career navigation, and many medical scenarios.

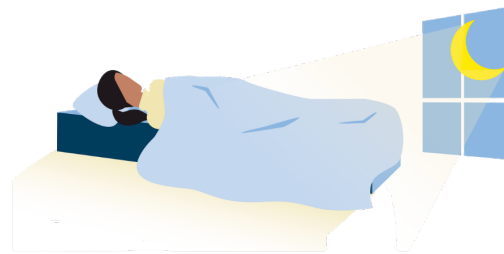
## EXPERIENCE, SUPPORT, AND SLEEP HELP ADOLESCENTS MAKE HEALTHY DECISIONS

Like any skill, learning to make healthy decisions that align with our long-term goals requires practice. During adolescence, we are especially good at learning from new experiences and adapting our behaviors accordingly.<sup>18</sup> The adolescent brain is especially receptive to new information, strengthening and streamlining connections among regions of the brain in response to our experiences. Experiences that allow us to practice healthy decision-making, consider our long-term goals, and manage our emotions during adolescence can promote healthy development and ultimately prepare us to navigate the transition to adulthood.

Research has also shown that our peers and supportive adults can help us regulate our emotions in ways that lead to healthy decisions.<sup>19</sup>

As we navigate new and unfamiliar challenges during adolescence, guidance from caring adults as well as our peers can help us deal with stress and make well-informed choices.

Studies have also showcased the importance of [sufficient, restful sleep](#) for healthy decision-making during adolescence.<sup>20</sup>



Sleep during adolescence has been linked to brain functioning in regions that support self-control, learning, emotional regulation, social interactions, and reward processing,<sup>21</sup> all important elements of everyday decision-making. Research has also demonstrated that sleep affects how our brains develop over time. In particular, consistent, healthy sleep is crucial for developing connections between neurons and building more efficient pathways throughout the brain.

Together, this research suggests that the amount of sleep an adolescent gets, the quality of that sleep, and the consistency of nightly sleep all affect brain functioning and brain development in ways that impact decision-making during adolescence.

## Policy and Practice Insights

- ◆ During adolescence, we build our decision-making skills in response to our experiences, as our brains strengthen and streamline connections based on real-life, trial-and-error learning. Youth need access to activities that allow them to practice healthy decision-making, consider their long-term goals, and manage strong emotions to prepare them to navigate the transition to adulthood.
- ◆ Research indicates that by middle adolescence (about age 16), young people can make decisions as well as adults when given relevant information and enough time to consider their options. With support and space to deliberate, adolescents as a group have the capacity to make sound, well-reasoned decisions about their health, their vote, their medical decisions, and their career paths.
- ◆ Stress can lead to more impulsive decisions that have a higher likelihood of a negative outcome, particularly when adolescents are not given sufficient time to make a decision. When youth are making particularly consequential decisions under challenging circumstances—for example, related to their legal rights, education, finances, or health care—supportive adults should ensure they have the time and information they need to weigh their options.
- ◆ Research suggests that adolescents are more likely to make riskier, sometimes more impulsive, decisions when they are in the presence of peers. These patterns may, in part, explain why young people are more likely than adults to commit crimes in groups with other youth,<sup>22</sup> and particularly to engage in crimes with peers who are within a year or so of their own age.<sup>23</sup>
  - However, peers can also positively impact young people’s decision-making. For instance, research has found that adolescents are more likely to express interest in volunteering in their community when they see their peers doing so.<sup>24</sup> Programs focused on encouraging positive youth choices—such as community engagement or healthy behaviors—may benefit from including peer support or peer mentors into their models.
- ◆ Heightened risk-taking during adolescence partly stems from a greater willingness to tolerate ambiguous situations and to predict a positive outcome when the outcome is unknown.
  - In real-world scenarios, this may mean that informing young people about real risks and benefits could help them to take fewer negative risks. This may be particularly important to consider in systems where risks and benefits may be known to others, but less accessible to young people as decision-makers (for example, when investing in career training, applying for student or consumer loans, or engaging in gambling or sports betting).
  - This difference from adult decision-making may have implications at several points in the criminal justice system, including for the assessment of a young person’s mental state (*mens rea*) and decisions regarding post-adjudication sentencing and services.

## ENDNOTES

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