

Can a 10-year-old be responsible for a crime? Here's what brain science tells us

August 29 2024, by Susan M. Sawyer and Nandi Vijayakumar



Credit: Pixabay/CC0 Public Domain

The age a child can be arrested, charged and jailed in Australia is back in the spotlight.

Last year, the Northern Territory became the first jurisdiction to raise the age of criminal responsibility from 10 to 12. Now its new, tough-on-crime government has pledged to [return it to ten](#). It comes after Victoria [walked back](#) its earlier commitment to raise the age to 14, settling instead on 12.

But the United Nations Committee on the Rights of the Child says 14 should be the absolute [minimum](#). It raised this age from its earlier recommendation (in 2007) of 12, citing a decade of new research into child and [adolescent development](#).

So what does the science say? What happens to the brain between 10 and 14? And how much can those under 14 understand the consequences of their actions?

Who is an adolescent?

Our research shows adolescence is a [critical period](#) for development. It's the time children's experiences and explorations shape how they develop cognitive skills (including critical thinking and decision making), as well as social and emotional skills (including moral reasoning).

Adolescence also lasts longer than we tend to think. Important brain development begins during late childhood, around eight to nine years. Intense changes then follow during [early adolescence](#) (ages 10 to 14). But these changes continue well into the twenties, and full cognitive and emotional maturity is not usually reached until around age 24.

However, everyone's brain matures at a different rate. That means there is no definitive age we can say humans reach "adult" levels of cognitive maturity. What we do know is the period of early adolescence is critical.

What does puberty do to the brain?

Puberty is a defining feature of early adolescence. Most of us are familiar with the changes that occur to the body and reproductive systems. But the increase in puberty hormones, such as testosterone and estrogen, also trigger changes to the brain. These hormones [increase most sharply](#) between 10 and 15 years of age, although gradual changes continue into the early twenties.

Puberty hormones change the structures in the brain which process emotions, including the amygdala (which encodes fear and stress) and ventral striatum (involved in reward and motivation).

This makes adolescents particularly reactive to emotional rewards and threats. [Our research](#) has shown the brain's sensitivity to emotions increases throughout early adolescence until around 14 or 15 years old.

At the same time, changes in puberty have [been linked](#) to increased sensation seeking and impulsive behaviors during early adolescence.

This context is crucial when we discuss the behavior of children in the 10 to 14 age range. The way their brains change during this period makes them more sensitive and responsive to emotions, and more likely to be seeking experiences that are new and intense.

How do adolescents make decisions?

The emotional context of puberty influences how younger adolescents make decisions and understand their consequences.

Decision making relies on several basic cognitive functions, including the brain's flexibility, memory and ability to control impulses.

These cognitive abilities—which together help us consider the consequences of our actions—undergo some of the [steepest development](#) between ages 10 and 14. By age 15, the ability to make complex decisions has usually [reached adult maturity](#).

But adolescents at this age remain highly susceptible to emotions. So while their brain may be equipped to make a complex decision, their ability to think through the consequences, weighing up costs and benefits, can be clouded by emotional situations.

For example, [research has shown](#) 13–14 year-olds were more distracted from completing a task and less able to control their behavior when they viewed images that made them feel negative emotions.

The social world of teenagers also has a significant impact on how they make decisions—especially in early adolescence. One study found that while older adolescents (aged 15–18) are more influenced by what adults think when weighing up risk, adolescents aged 12–14 [look to other teenagers](#).

Experiments [have also shown](#) adolescents aged 12–15 make riskier decisions when they are with peers than by themselves. Their brain responses also suggest they experience a greater sense of reward in taking those risks [with peers](#).

How do teens understand the consequences of their actions?

The concept of [criminal responsibility](#) is based on whether a person is able to understand their action and know whether it is wrong.

Moral reasoning—how people think about right and wrong—depends on

the ability to understand another person's mental state and adopt their perspective. These skills are in development [across adolescence](#).

Research suggests it may take more effort for adolescent brains to process ["social" emotions](#) such as guilt and embarrassment, compared to adults. This is similar when they make [moral judgments](#). This evidence suggests teenage brains may have to work harder when considering other people's intentions and desires.

Young adolescents have the cognitive ability to appreciate they made a bad decision, but it is more mentally demanding. And social rewards, emotions and the chance to experience something new all have a strong bearing on their decisions and actions in the moment—possibly more than whether it is right or wrong.

Early adolescence is critical for the brain

There are also a number of reasons adolescent brains may develop differently. This includes various forms of neurodisability such as acquired brain injury, [fetal alcohol spectrum disorder](#), [attention-deficit hyperactivity disorder](#) (ADHD) and intellectual disability, as well as exposure to trauma.

Teenagers with neurodevelopmental disorders will likely cope differently with [decision making](#), social pressure, impulse control and risk assessment, and face [extra difficulties](#). Across the world, they are [disproportionately incarcerated](#).

In Australia, Indigenous children and adolescents are incarcerated [in greater numbers](#) than their non-Indigenous peers.

Each child matures differently, and some face extra challenges. But for every person, the period between 10 and 14 is critical for developing the

cognitive, social and [emotional skills](#) they'll carry through the rest of their life.

This article is republished from [The Conversation](#) under a Creative Commons license. Read the [original article](#).

Provided by The Conversation

Citation: Can a 10-year-old be responsible for a crime? Here's what brain science tells us (2024, August 29) retrieved 29 August 2024 from <https://medicalxpress.com/news/2024-08-year-responsible-crime-brain-science.html>

<p>This document is subject to copyright. Apart from any fair dealing for the purpose of private study or research, no part may be reproduced without the written permission. The content is provided for information purposes only.</p>
--