

When do we become adults - Brain science and passive voice - Video transcript

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00:00 Most countries recognize 18 as the start of adulthood by granting various freedoms and privileges. But is age the best way to measure maturity?

00:17 I was born 12:05 AM on November 6th— 5 minutes short of being eligible to vote in the election tomorrow.

00:24 Meanwhile, your big brother— yours truly— was born 15 minutes earlier, so I can vote.

00:30 It's arbitrary and unfair!

00:33 The voting age should be lowered to 16!

00:37 I firmly disagree! No way 16-year-olds are mature enough to make decisions with national consequences.

00:42 I'm eligible and I don't even know who's running. Meanwhile, I know the candidates inside and out.

00:50 She's obsessed with politics.

00:52 Exactly! If 16-year-olds aren't mature enough to vote, then by that same logic, they shouldn't be allowed to drive.

00:58 I firmly disagree! I'm an excellent driver! And I've never gotten a ticket, unlike some people.

01:04 That's so unfair! That stop sign was hidden by a tree.

01:08 I think you both make valid points. And questioning the age limits of adulthood is well warranted.

01:14 Some countries have lowered the voting age to 16, and cultural coming-of-age ceremonies are often celebrated at different ages.

01:21 As there seems to be no consensus on exactly when we reach maturity, perhaps science can give us a clearer answer.

01:30 One way neuroscientists have looked to define adulthood is by when the brain is fully grown.

01:36 Brain development involves two trajectories.

01:39 First, there's a reduction in **gray matter**. **Gray matter** consists of cells and connections that facilitate communication at short ranges, creating dense, information-processing hubs.

01:51 While a reduction may seem like a bad thing, what's happening is a **selective pruning**. Connections that are used are kept and strengthened, while under-used ones are weeded away, creating a brain that is both fine-tuned to its environment and energy efficient.

02:08 This **gray matter** reduction coincides with an increase in **white matter**.

02:13 **White matter** refers to connections that are **myelinated**, coated in a layer of insulation, allowing for fast far-range communication between information hubs.

02:23 For example, these paths connect regions that signal the pleasure of immediate reward with regions that help us plan ahead, allowing us to make more balanced, forward-thinking decisions.

02:34 Imaging studies show that **white** and **gray matter** volumes undergo drastic changes during adolescence, and continuing through your twenties.

02:44 But the brain's journey is far from finished, as various experiences continue to reshape its connections throughout your lifetime.

02:49 So brain structure alone may not give us our answer.

02:53 Another way scientists have tried to define adulthood is by measuring **cognitive development**— when are you able to learn and complete mental tasks at the same efficiency as older adults?

03:05 By this definition, adulthood may begin as early as 16, as teens perform just as well on tests that assess reasoning, problem-solving and critical thinking.

03:14 Though capable of making smart, well-informed decisions, teens may be more susceptible to external pressures.

03:21 Studies show that when performing risk-taking and self-control related tasks, 18 to 21 year olds behave much like older adults.

03:29 But when these tests include an emotional element— such as utilizing self-control when identifying fearful faces— or a social element— such as making a decision in the presence of a friend— different patterns emerge.

03:42 Under these influences, 18 to 21 year olds tend to behave more like younger teens, and their brains show younger-teen-like patterns of activity.

03:51 In other words, during your teens and early twenties, your brain is wired to place more value and attention on **\*\*social and emotional elements\*\***.

04:00 This allows emerging adults to better explore their identities and connect with others, but may also create more vulnerability to negative peer influence and rash heat of the moment decisions.

04:11 For this reason, many scientists argue that judicial systems should expand juvenile courts to include those in their late teens and early twenties, as current systems fail to recognize how the emerging adult brain is still changing.

04:25 So when are you actually an adult?

04:27 As you can see, there is no exact age or moment in development that we can point to.

04:32 Instead, neuroscience suggests that there are **\*\*waves of maturity\*\***.

04:36 As different brain regions and mental abilities mature at different times, so do different adult-like states and behaviors.

04:44 Not everyone will reach each **\*\*wave of maturity\*\*** at the same age.

04:47 Each person's journey to adulthood is unique, influenced by genetics, environment, and experience.