Supporting the Connecting Brain during Adolescence

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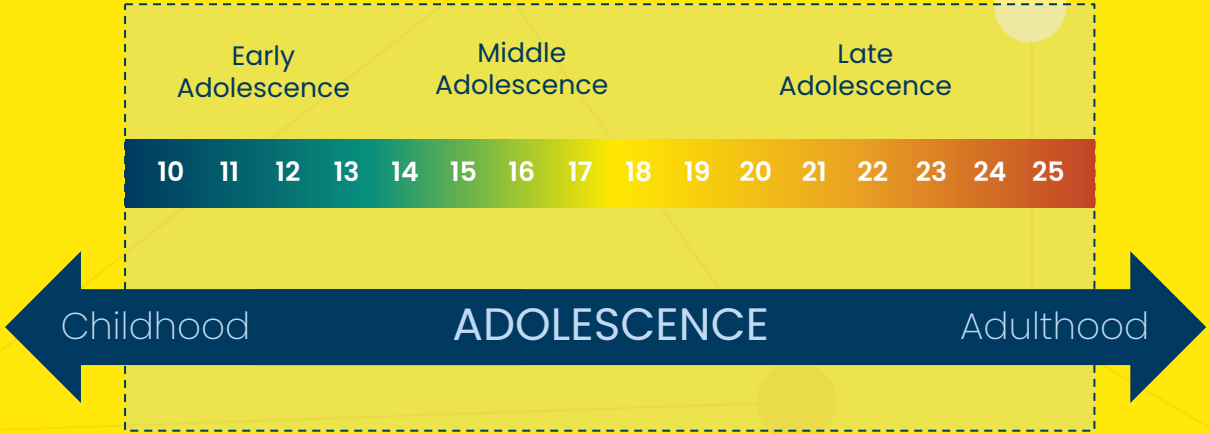
UCLA
Center for
the Developing
Adolescent

What Is Adolescence?

Developmental Periods of Adolescence



Adapted from *The Promise of Adolescence*, NASEM

What Is Adolescence?

Physical

Psychological

Social

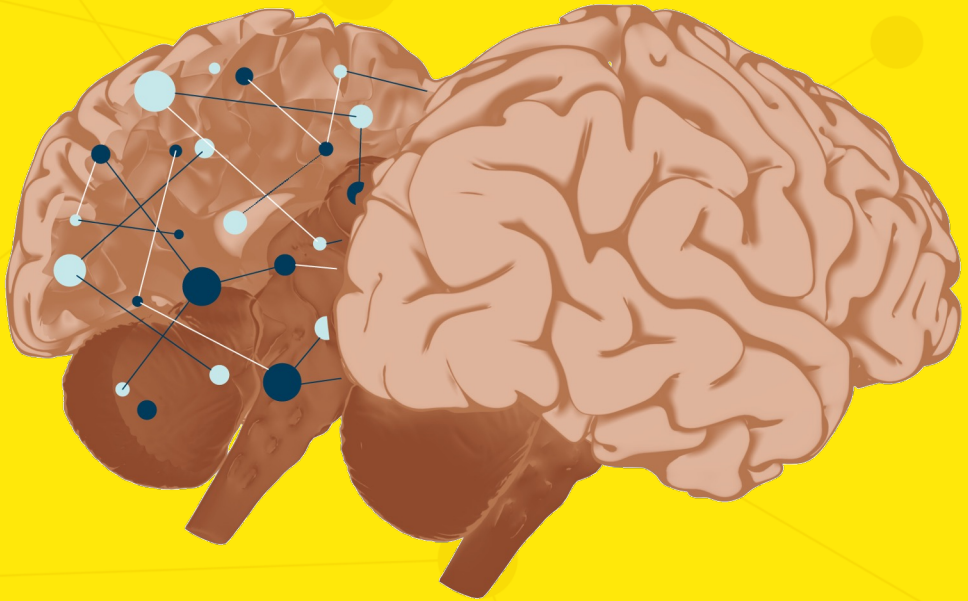
Why Is Adolescence Special?

Investments pay off for young people and communities

Help to realize gains from earlier investments

Brain Development during Adolescence

Fundamentally a story of connection within the brain



Brain Development during Adolescence

Fundamentally a story of connection within the brain *and between* young people and their environments

Brain Connectivity Is Refined during Adolescence

Credit: *UCLA Brain Mapping Center*

Plasticity in Brain Development during Adolescence

Neurons can gain and lose ~25% of their connections weekly at puberty

Drops to ~10% in adulthood

Credit: Javier Muñoz-Cuevas/Wilbrecht lab

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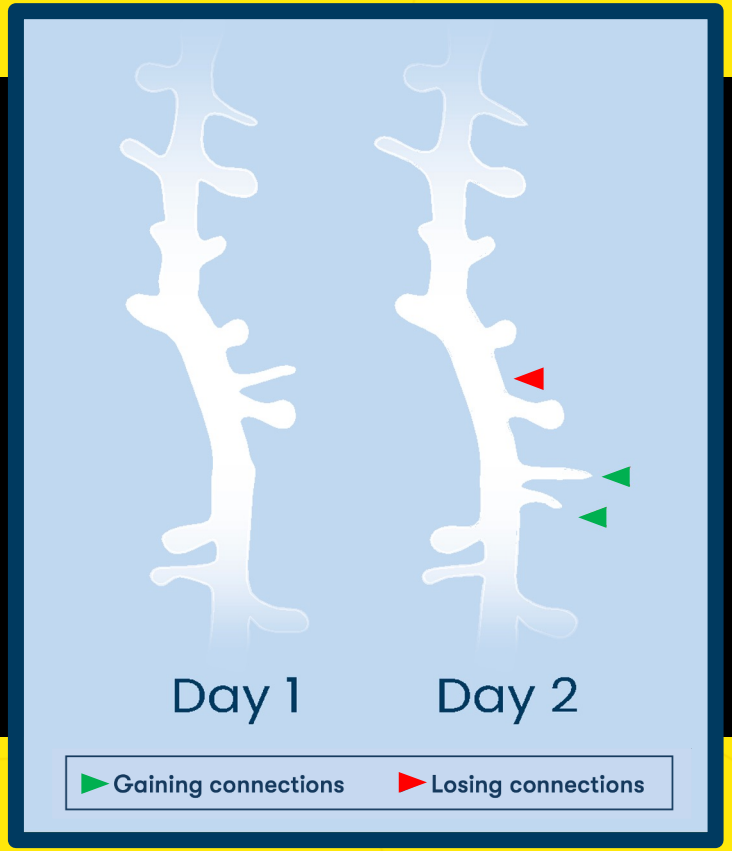
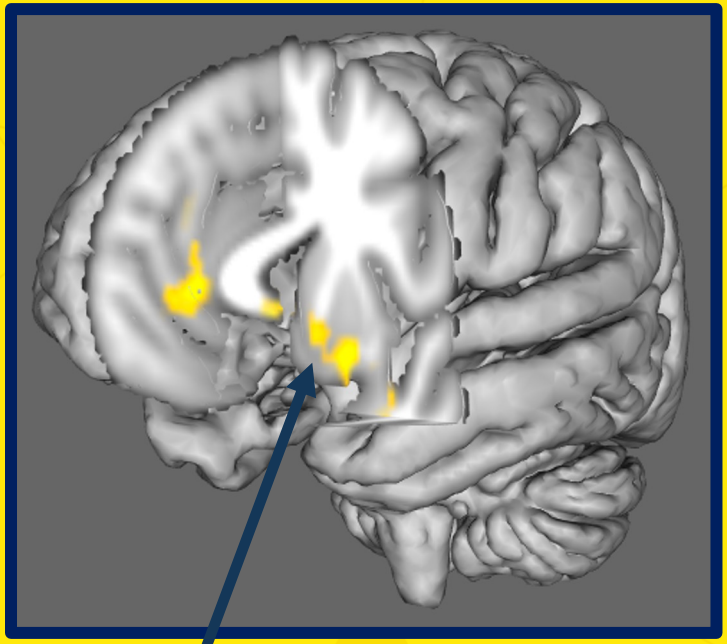


Credit: Javier Muñoz-Cuevas/Wilbrecht lab

A Brain Designed for Exploration & Connection

Our motivation and reward systems are more active



Striatal regions respond to diverse rewards

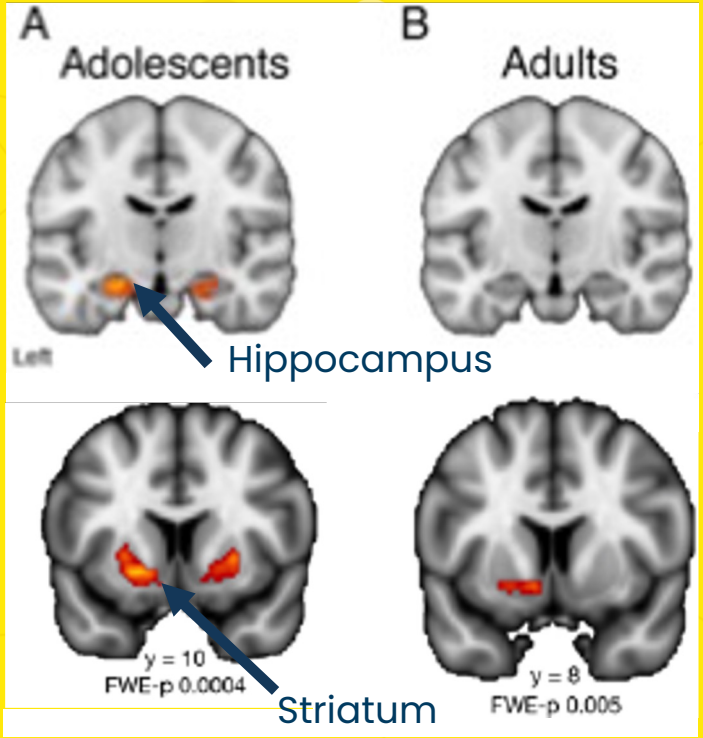
Credit: Galván lab

A Brain Designed for Exploration & Connection

Our motivation and reward systems are more active

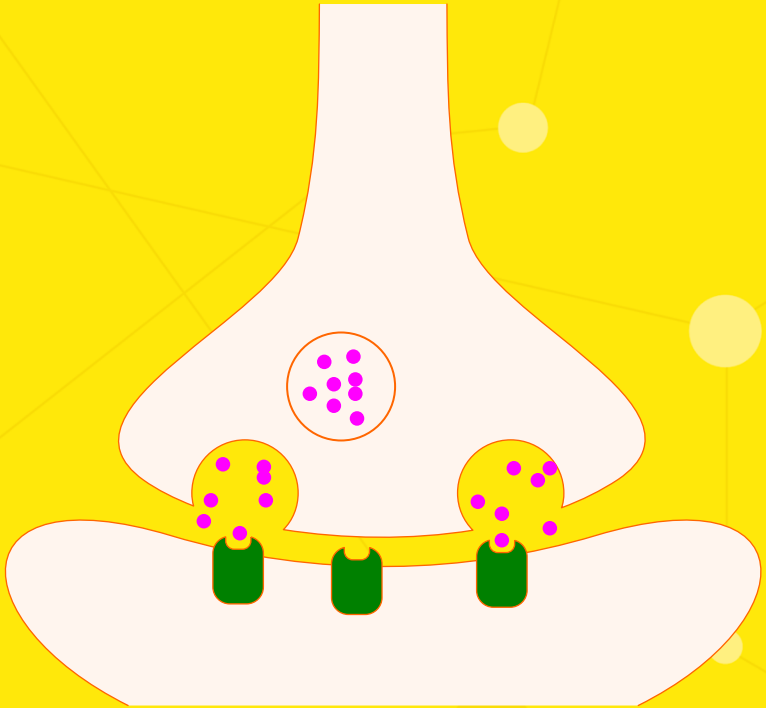
We are uniquely skilled at exploratory & flexible learning

Learning systems are uniquely responsive during adolescence and beneficial for learning



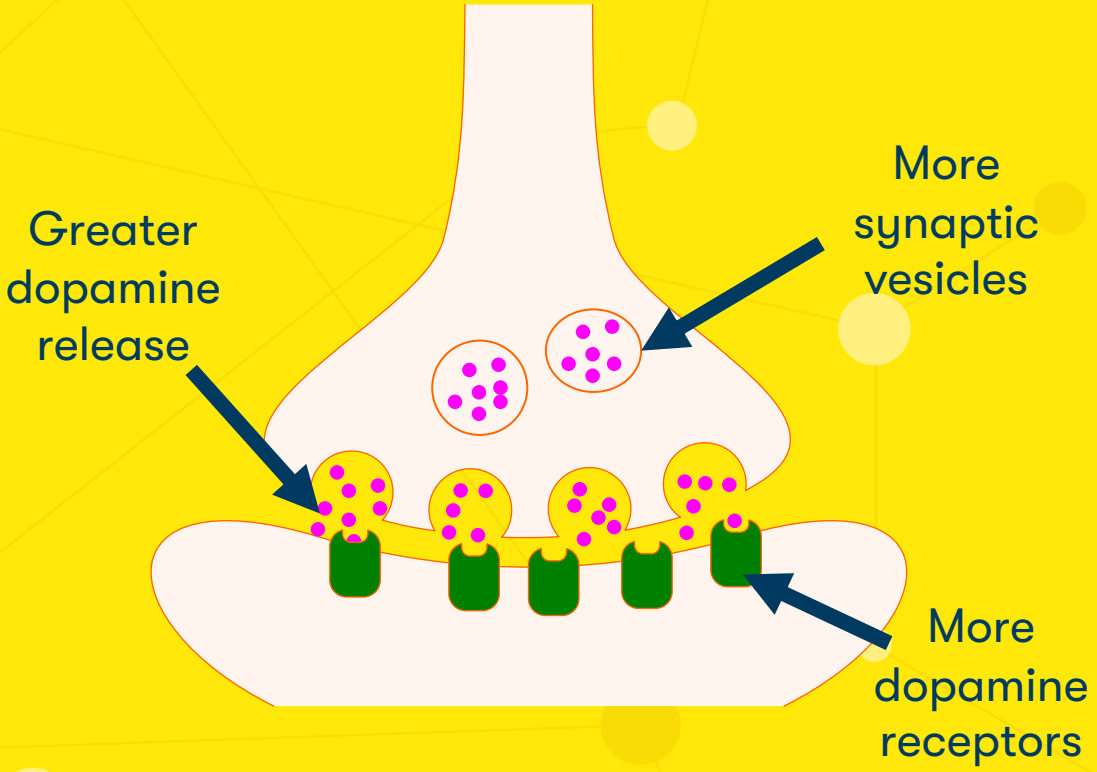
Credit: Davidow, Foerde, Galván and Shohamy, 2016

Dopamine in Adults



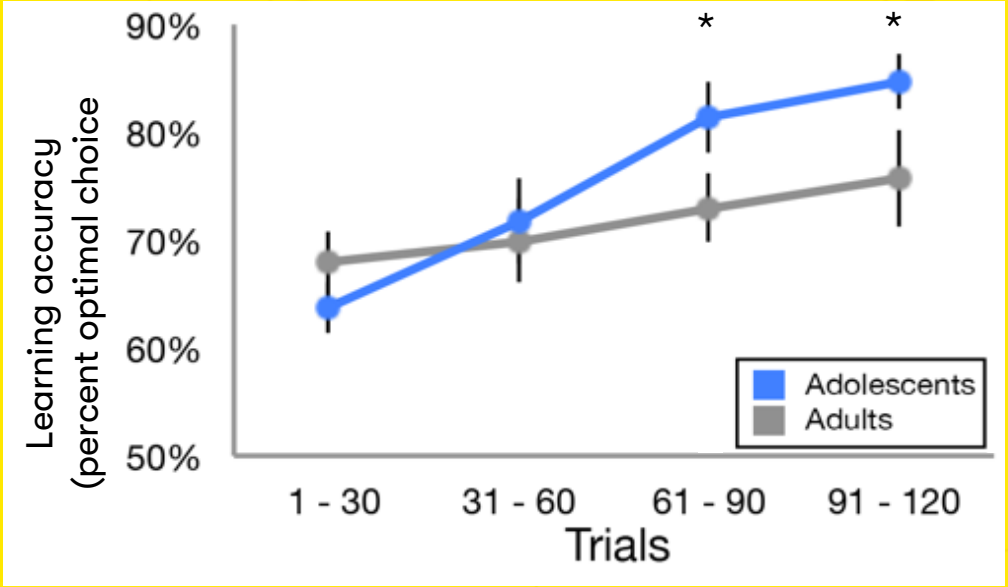
Dopamine in Adolescents

The learning and reward center of the brain is dopamine-rich and particularly active during adolescence



The Adolescent Brain is Primed to Learn from Experience

During a learning experiment, adolescents were better than adults at learning associations



Credit: Davidow, Foerde, Galván and Shohamy, 2016

Experience Plays a Major Role in Brain Development

Social structures and systems can support or challenge positive development

Communities and cultural practices support development

Negative experiences including exposure to violence and isolation impede healthy development

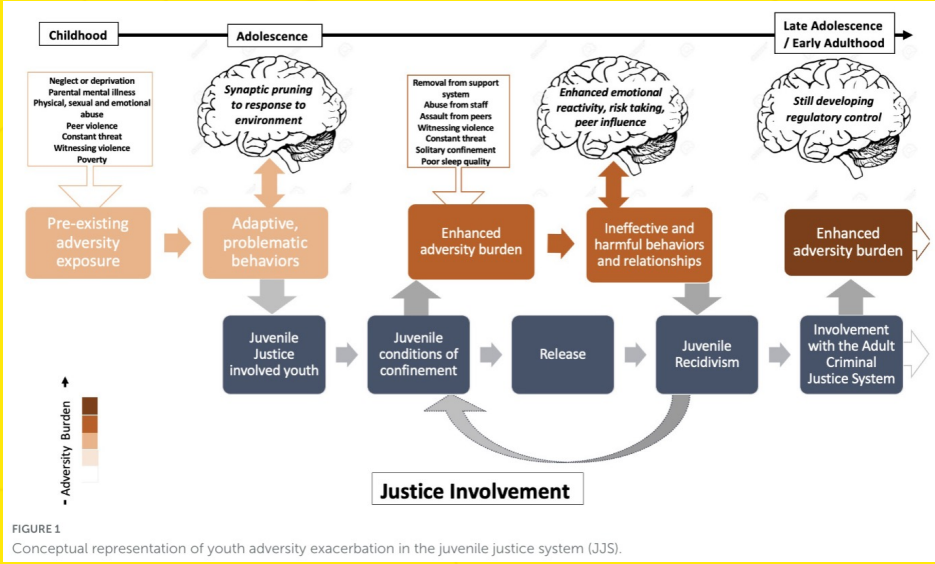


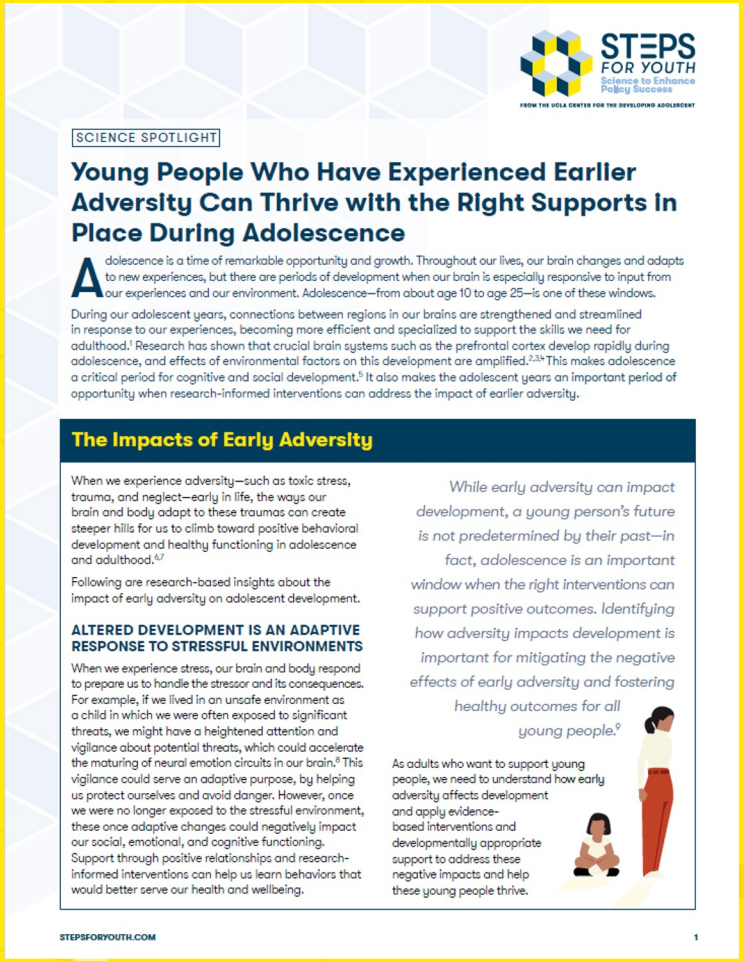
FIGURE 1
Conceptual representation of youth adversity exacerbation in the juvenile justice system (JJS).

Credit: Orendain, Galván, Smith, Barnert, Chung, 2022

Supporting Youth after Early Adversity

Many of us have faced challenges or adversities early in life and may need extra support

Our adolescent years present an opportunity to build positive connections by supporting key developmental needs



STEPS FOR YOUTH
Science to Enhance Policy Success
FROM THE UCLA CENTER FOR THE DEVELOPING ADOLESCENT

SCIENCE SPOTLIGHT

Young People Who Have Experienced Earlier Adversity Can Thrive with the Right Supports in Place During Adolescence

Adolescence is a time of remarkable opportunity and growth. Throughout our lives, our brain changes and adapts to new experiences, but there are periods of development when our brain is especially responsive to input from our experiences and our environment. Adolescence—from about age 10 to age 25—is one of these windows.

During our adolescent years, connections between regions in our brains are strengthened and streamlined in response to our experiences, becoming more efficient and specialized to support the skills we need for adulthood.[1] Research has shown that crucial brain systems such as the prefrontal cortex develop rapidly during adolescence, and effects of environmental factors on this development are amplified.[2,3,4] This makes adolescence a critical period for cognitive and social development.[5] It also makes the adolescent years an important period of opportunity when research-informed interventions can address the impact of earlier adversity.

The Impacts of Early Adversity

When we experience adversity—such as toxic stress, trauma, and neglect—early in life, the ways our brain and body adapt to these traumas can create steeper hills for us to climb toward positive behavioral development and healthy functioning in adolescence and adulthood.[6,7]

Following are research-based insights about the impact of early adversity on adolescent development.

ALTERED DEVELOPMENT IS AN ADAPTIVE RESPONSE TO STRESSFUL ENVIRONMENTS

When we experience stress, our brain and body respond to prepare us to handle the stressor and its consequences. For example, if we lived in an unsafe environment as a child in which we were often exposed to significant threats, we might have a heightened attention and vigilance about potential threats, which could accelerate the maturing of neural emotion circuits in our brain.[8] This vigilance could serve an adaptive purpose, by helping us protect ourselves and avoid danger. However, once we were no longer exposed to the stressful environment, these once adaptive changes could negatively impact our social, emotional, and cognitive functioning. Support through positive relationships and research-informed interventions can help us learn behaviors that would better serve our health and wellbeing.

While early adversity can impact development, a young person's future is not predetermined by their past—in fact, adolescence is an important window when the right interventions can support positive outcomes. Identifying how adversity impacts development is important for mitigating the negative effects of early adversity and fostering healthy outcomes for all young people.[9]

As adults who want to support young people, we need to understand how early adversity affects development and apply evidence-based interventions and developmentally appropriate support to address these negative impacts and help these young people thrive.

Developmental Needs during Adolescence

Experiences that support the connecting brain and help youth thrive

Exploring the world and testing out new ideas and experiences

Building decision making and emotional regulation skills

Forming values, goals, and identity

Sufficient sleep to support mental and physical wellbeing

Finding meaning and purpose through contribution

Support from parents and other caring adults

Finding respect among peers and adults

Confinement as Adversity

Confinement can:

- Expose young people to stressful environments
- Limit protective factors like community, family, and culture
- Restrict adolescents from filling key developmental needs

Aligning Justice Models with the Rehabilitative Opportunity of Adolescence

Adolescents have unique rehabilitative potential.

“Rehabilitative efforts that capitalize on youths’ existing strengths and incentivize learning through rewards versus punishments are neurodevelopmentally poised to succeed.”

Credit: Orendain, Galván, Smith, Barnert, Chung, 2022