



## Neuroscience Lesson Behind Student Trauma

Welcome to this audio brief, developed especially for out-of-school time professionals like you, and brought to you by the U.S. Department of Education's 21<sup>st</sup> Century Community Learning Centers National Technical Assistance Center. This resource is one of several that the center provides to help you support students. This one looks at the neuroscience behind student trauma and introduces the idea of the upstairs and downstairs brains. The information in this recording was adapted from the work of Dan Siegel and Tina Payne Bryson.

Have you ever wondered what's going on in the mind of a student doing things you might see as unpredictable, confrontational, or even out of control?

As educators, we're in a critical position to support students who have faced distressing or disturbing events. This includes exploring positive and practical educational strategies to create a psychologically safe environment for the students we serve.

Let's take George, for example. George is an amazing fourth-grader that typically is very quiet and reserved. He seems to come alive when he's talking with the teacher or other students, or busy with activities that he likes. But every now and then, George starts fistfights with other kids, and has been seen cursing and destroying some of the materials around the room. It's discovered later that George has been experiencing verbal abuse and teasing at school and at home.

You can help students like George understand what's happening in their brain when they are upset or angry, then help them make positive choices and regulate their emotions and behavior. Ultimately, this also supports their cognitive development. In the book *The Whole-Brain Child*, Dr. Dan Siegel and Dr. Tina Payne Bryson introduce the useful analogy of the upstairs and downstairs brain.

Picture the brain like a house with a downstairs and an upstairs. Downstairs is where the more basic functions of the house occur, like in the kitchen and laundry room. Likewise, the downstairs brain, or limbic system, controls the basic brain functions like breathing; blinking; and the fight, flight, or freeze response. This is where emotions happen too. Now the upstairs brain, or neocortex, is more complex and involves more complicated mental processes. Like the upstairs in a house where we go to read a nice book, do a puzzle with our kids, and recharge our batteries at night, the upstairs brain controls our thinking, our body control, self-awareness, problem-solving, and decision-making. The neocortex is not fully developed until we reach our mid-20s! This is part of why we may see young students like George sometimes acting erratic or explosive without weighing the effects of those decisions. But there is more to the story.

To function, we need both the upstairs and downstairs brains. The downstairs brain keeps us safe and helps us detect serious or unsafe situations in a very unsophisticated — really an animalistic — way. This part of the brain can't be in complete control, so we need the upstairs brain to work



with the downstairs brain. In other words, we need a staircase! The staircase helps the upstairs brain monitor emotions and impulses in the downstairs brain and make sense of our reactions to the environment. Find a neutral time to talk in age-appropriate terms to all your students about their good cognitive health. Your elementary students will understand the downstairs and upstairs brain metaphor, and how they will use their staircase. Your *adolescent* students should be taught the importance of strong neural pathways between their limbic system and their neocortex in bringing their thoughts and feelings together constructively. This way, when a moment of crisis arrives, these terms and concepts will mean something to them.

Helping kids understand what part of their brain they are using when they throw a tantrum or can't control their emotions is truly a lifelong tool to give them, and is an important step for you, the educator, in responding supportively and effectively. When a child is "flipping their lid," this means their upstairs and downstairs brains aren't working together. A child who is upset and angry or can't make decisions is trapped in their downstairs brain. Once the child is comforted by an adult, then problem-solving can begin. Saying to them, "I see you are upset about this," validates how they feel. The child may be comforted by this alone, but you can begin to problem-solve by also walking them through a conversation about their downstairs brain needing a little help from their upstairs brain.

As afterschool professionals, we develop close and trusting relationships with our students. Our students may even depend on our program staff to show them compassion, care, and empathy that could be lacking in their lives outside these four walls. We can and should be a strong influence through our modeling and reinforcement of social-emotional skills. Check in to see how students are feeling every day to show you care for and respect them as individuals. That display of genuine concern for a student's daily well-being could be the most positive interaction that student receives in a given day. With any luck, they'll pass on that same respectful and compassionate spirit to their peers. You can cultivate an environment where emphasis is on guidance and learning rather than punishment. Shifting our own mode of thinking in this way can make us more empathetic and more likely to take the time to slow down and help students understand and manage their feelings more effectively.

So, what else can we do to support students and the upstairs and downstairs brain? There are really useful strategies you can introduce to young children and adolescents. First, make it a habit to think about how they are feeling, and how, good or bad, this is engaging, not enraging, their downstairs brain. Once you have acknowledged together how they feel, start talking about finding a solution to bad feelings. Threatening students or giving consequences because of their feelings or behaviors will not teach them to use their upstairs brain to problem solve.

You can also encourage a student to move their body when upset to regain their emotional balance between the upstairs and downstairs brain. In 2001, researchers Siegel and Bryson determined that by changing our physical state, whether with movement or relaxation, we can change our emotional state. Deep breathing, chair push-ups, stretching, taking a walk, or other physical activities like jumping jacks or sit-ups are all helpful. Another strategy to offer students is using



tactile sensations like hugging stuffed animals, holding or rubbing a worry stone, or wrapping in a blanket to self-soothe and get our upstairs brain back in charge.

It is important to bear in mind that experiences like extreme danger, fear, or trauma can more severely block students from using their upstairs brain at all, or accessing their staircase. Working with a professional trained in trauma therapy may be necessary, and you should consult your organization's policy when in doubt. But you can never go wrong with a healthy regimen of kindness, compassion, and patience in your trauma-informed 21<sup>st</sup> CCLC practice.

We hope this audio brief has helped you gain a better understanding of this important topic area. For additional resources on topics relevant to out-of-school time programs, visit the 21<sup>st</sup> CCLC National Technical Assistance Center website at [21stcclcntac.org](https://21stcclcntac.org).

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Adapted from Siegel, D. J., & Bryson, T. P. (2011). *The whole-brain child: 12 revolutionary strategies to nurture your child's developing mind*. New York: Random House.

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