

How Trauma Affects the Brain

The way trauma influences brain development will be different for each person. Just as each child will have different emotional responses to a traumatic event, the way that the brain responds to trauma will also vary across children. The following regions of the brain are the most likely to change following a traumatic event.

prefrontal cortex



The **medial prefrontal cortex (mPFC)** helps to control the activity of the amygdala and is involved in learning that previous threats are no longer present. Connections between the mPFC and amygdala are sometimes not as strong in children who have experienced trauma. As a result, the mPFC is not as effective at reducing reactivity to people, places, and things that are no longer predict danger. This can lead to persistent elevations in fear and anxiety about reminders of the trauma they experienced.

The **hippocampus** is involved in learning and memory. Impairments in both have been seen in children who have experienced trauma, suggesting that trauma likely impacts a variety of types of learning and memory, such as the ability to learn and remember information about the environment. As a result, children who experience trauma may not be able to retain information about how to tell if one situation is safe and another is dangerous, leading them to experience harmless situations as scary. For example, a child who has experienced trauma may have difficulty distinguishing between activities that are dangerous (e.g., walking down a dark alley) and safe (e.g., walking around a dark corner at home).

hippocampus



amygdala



The **amygdala** is designed to detect and react to people, places, and things in the environment that could be dangerous. This is important for safety and survival. After trauma, the amygdala can become even more sensitive to potential threats, leading a child to closely monitor their surroundings to ensure they are safe and have strong emotional reactions to people, places, or things that might be threatening or that remind them of the trauma. This heightened attention to potential threats can make it hard for children to pay attention in school, go new places, or interact with people they don't know.

These changes in the brain are **not** permanent

The brain is remarkably plastic, meaning that it changes in response to social and environmental and experiences. This enables us to learn, form relationships with people, and develop new skills. Changes in the brain that happen after trauma can improve over time. This is particularly likely to happen when children experience safe, stable, and supportive environments after trauma. In fact, certain kinds of psychotherapy, like cognitive behavioral therapy, can actually lead to positive changes in the same regions of the brain that are influenced by trauma.