

A sudden and lasting separation from a parent can permanently alter brain development

June 22 2018, by Jacek Debiec

At birth, the brain is the most underdeveloped organ in our body. It takes up until our mid-20s for our brains to fully mature. Any serious and prolonged adversity, such as a sudden, unexpected and lasting separation from a caretaker, changes the structure of the developing brain. It damages a child's ability to process emotion and leaves scars that are profound and lifelong.

That's bad news because, although President Trump has ended his "zero-tolerance" immigration policy of separating [parents](#) and [children](#) at the border, there are some [2,300 children](#) whose reunification with parents remains uncertain.

In my psychiatric and therapeutic practice, I work with children and adults who as children experienced unexpected and lasting separation from their parents. Some fare better than others. Some struggle with major psychiatric disorders, whereas others have no psychiatric diagnosis. Yet, their feeling of safety and trust in others is compromised. The impact of separation trauma is everlasting.

Born to be nurtured

Altricial species, such as humans, are dependent upon parental care for survival and development after birth. The parent is necessary to regulate the offspring's temperature and to provide food and protection against

environment threats. This is accomplished through parent bonding with the offspring that nurtures a deep attachment. The newly born learn quickly that signs of [parental presence](#), such as an image, voice, touch or smell, [signal safety](#).

Studies in mammals show that infants naturally conform to parental emotions. The presence of a calm and caring parent produces the feeling of safety in a child. On the contrary, [parental distress and fear activate the infant's brain circuits](#) that are responsible for processing stress, pain and threat. The ability of a caretaker to regulate the offspring's emotions is an adaptive function encoded in our genes. Before people have our own independent experiences, we start learning what is safe and what is dangerous in the surrounding environment through observing and interacting with our parents. This increases our chances of survival and success in the world.

[Numerous studies](#) show that parental presence is more important than the surrounding environment for the emotional well-being of an infant or a very young child. As long as the parent is present and remains calm and caring, the child is able to endure many threats and adversities. Metaphorically speaking, the caretaker is the world for the young child.

Separation alters the brain's structure

The parents' presence is also necessary for a person's harmonious growth and development. That includes the [development of our psychological and social functions](#), such as our ability to respond to stress and self-regulate our emotions or our ability to trust others and function in a group.

Any serious and prolonged disruption of [parental care](#), especially in infants and very young children, alters how the young [brain](#) develops. Very young children, younger than five years old, separated from their

parents cannot rely on their presence and care anymore, which causes their stress levels to spike. As [stress hormones](#) like cortisol, epinephrine and norepinephrine rise, they alter physiological functions of our bodies to better prepare us to cope with threat. However, prolonged increases in the levels of stress hormones disrupt physiological functions and induce inflammation and epigenetic changes – chemical alterations that disrupt the activity of our genes. Turning genes on or off at the wrong time alters the developmental trajectory of the brain, changing how neural networks are formed and how brain regions communicate.

[Studies](#) of children who were separated from their parents or neglected by their parents, and [experimental research on animals](#), consistently show that the disruption of parental presence and care causes a precocious and rapid maturation of brain circuits responsible for processing stress and threat. This fast-track development alters the brain's wiring and changes the way how emotions are processed.

Short, sharp separation quickly causes harm

Laboratory studies show that it doesn't take long for separation to hurt these infants and children.

[In laboratory rodents](#) these changes in brain wiring are triggered when a pup is separated from its mother for a mere two to three hours a day for a several consecutive days. We know the stress to the pups is caused by the mother's absence, not by other changes in the environment, because the researchers continued to feed the pups and maintain their body temperature during the experiment.

Premature maturation of stress and threat processing networks in the brains of children separated from parents stunts the child's development and leads to [loss of flexibility in responding to danger](#). For example, most of us are able to "unlearn" what we may have initially considered

threatening or scary. If something or someone is not dangerous anymore, our defense responses adapt, extinguishing our fear. This ability to unlearn threat is compromised in maternally separated animals.

The subsequent reunification with a parent, or the replacement with a new caretaker, may not reverse the changes caused by this early separation stress.

Pictures of the brain reveal altered brain structures

Brain imaging studies demonstrate structural and functional changes in the brains of children separated from their parents. Specifically, [the stress of separation increases the size of the amygdala](#), a key structure in threat processing and emotion, and [alters amygdala connections](#) with other brain areas. On the molecular level, [separation alters the expression of receptors on the brain cell's surface involved in stress response](#) and emotion regulation. Without the right number of receptors, the communication between neurons is disrupted.

The trauma of either permanent or temporary separation poses general health risks and affects academic performance, success in career and personal life. In particular, the loss or [separation from parents increases the likelihood of various psychiatric disorders](#), including post-traumatic stress, anxiety, mood, psychotic or substance use disorders.

The feeling of safety and the associated ability to bond with others, the ability to detect and respond to threat, as well as the ability to regulate one's own emotions and [stress](#) are vital. Early reprogramming of neural circuits underlying these functions can directly or indirectly alter the child's physical, emotional and cognitive development and causes lifelong changes.

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