## Social Dysfunction: The Effects of Early Trauma and Adversity on Socialization and Brain Development.

## https://acamh.onlinelibrary.wiley.com/doi/10.1111/jcpp.12507

## <https://www.researchgate.net/publication/308303380_The_effects_of_childhood_maltreatment_on_brain_structure_function_and_connectivity>

Brain development is directed by genes but sculpted

by experiences, particularly those occurring during

early sensitive or critical periods. Studies suggest that

the onset of regional critical periods may be triggered

when GABAergic inhibitory influences develop to the

point that they come into balance with excitatory influ-

ences1. This balance allows experience to shape and

fine-tune connectivity patterns and network architec-

ture. Contrary to earlier notions, plasticity is not lost but

seems to be dampened by molecular ‘brakes’ that draw

critical periods to a close, although these brakes can be

lifted through pharmacological manipulations or epi-

genetic modifications1. Together, these developmental

processes provide a highly adaptive mechanism for the

formation of optimally sculpted neural representations

to guide future actions based on early experience, while

allowing possible revisions1.

There are few early experiences as consequential as

abuse and neglect. Studies on the effects of childhood

maltreatment typically include physically, sexually and

emotionally abusive acts and episodes of both physical

and emotional neglect. Emotional maltreatment includes

intentionally eliciting feelings of guilt, shame or fear to

serve the emotional needs of the perpetrator; persuading

children to perform inappropriate acts; denigrating or

destroying things they value; or placing them in harm-

ful situations, such as witnessing interparental violence2.

Physical neglect is defined as failure to provide basic

needs such as food, clean clothing, shelter, supervision,

and dental and paediatric care2. Emotional neglect is the

failure to provide for fundamental emotional needs, by

being emotionally unresponsive to children’s distress,

failing to attend to their social needs or expecting chil-

dren to manage situations that are beyond their maturity

level or unsafe2. Some studies also include exposure to

various forms of household dysfunction, such as living

with substance-abusing parents.

According to the Adverse Childhood Experiences

(ACEs) study, a collaboration between Kaiser Permanente

and US Centers for Disease Control and Prevention,

exposure to one or more maltreatment-related ACEs

accounts for 54% of the population attributable risk (PAR)

for depression3, 67% of the PAR for suicide attempts3 and

64% of the PAR for addiction to illicit drugs4. Exposure

to five or more ACEs was associated with a 2-, 3-,

10- or 17-fold increase in risk for receiving a prescrip-

tion of an anxiolytic, antidepressant, antipsychotic or

mood-stabilizing medication, respectively5. Individuals

exposed to six or more ACEs were found to have a 20-year

reduction in lifespan6, which may be due to accelerated

telomere shortening7. Understanding how maltreatment

increases risk of various psychiatric and medical disorders

is of crucial importance to prevent, pre-empt or treat the

consequences of abuse and neglect.

We hypothesized several years ago that maltreatment

acts as a stressor to produce a cascade of physiological and

neurohumoral reactions that alter brain-development

trajectories, setting the stage for the emergence of psy-

chiatric symptoms in genetically susceptible individu-

als8–10. Since then, there have been more than 180 original

reports showing an association between childhood mal-

treatment and alterations in brain structure, function,

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The effects of childhood maltreatment

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## [The Neurobiology of Brain and Behavioral Development](https://www.sciencedirect.com/science/book/9780128040362). 2018, Pages 439-467.

Retrieved from https://www.sciencedirect.com/topics/neuroscience/corpus-callosum

## The corpus callosum is a large bundle of more than 200 million myelinated nerve fibers that connect the two brain hemispheres, permitting communication between the right and left sides of the brain that carry neural signals from one side of the brain to the other.

## Abnormalities within the corpus callosum have been identified in maltreated children. Teicher et al. (2004) examined the corpus callosum of children with a history of maltreatment. Researchers discovered that maltreated subjects had a 17% reduction in total corpus callosum area compared to controls, and an 11% reduction compared to non-maltreated psychiatric patients. Observed decreased corpus callosum size was associated with traumatic experiences early in life, rather than diagnosed psychiatric illness. Neglect was found to have a greater impact on corpus callosum size in boys. Alternatively, girls exhibited the most significant reduction in corpus callosum size in relation to sexual abuse.

## Interneurons are situated between sensory and motor neurons. There are approximately 20 billion interneurons, or *association neurons*. Most are found in the brain and the spinal cord, and others are within the autonomic ganglia. Interneurons make up > 99% of all the neurons in the body.

## The primary function of interneurons is integration. They carry sensory information and regulate motor activity. More interneurons are activated when a response to stimuli is required to be complex. Interneurons are utilized in all higher functions, including learning, memory, cognition, and planning. Nearly all interneurons are multipolar. However, they are of many different sizes and have different patterns of fiber branches. Although most of these fibers are thought to be excitatory, their effect may be inhibitory due to the activity of inhibitory [interneurons](https://www.sciencedirect.com/topics/neuroscience/interneuron).