



The importance of the first 1001 days: conception to Age two – Building the foundations of the mind.

**PIPUK**<sup>®</sup>  
Parent Infant Partnership  
United Kingdom

## Building the foundations of the mind

Humans are the most adaptable animals on the planet. Take a baby hedgehog from one part of the world and release it in another and it will still grow up to be a fairly boring hedgehog; take a baby human from one part of the world and bring it up in a totally different place and culture and he or she will become a totally different person.

We are what is known as an altricial species, born far less formed and far more helpless than other animals and so dependent on our parents for much longer. We have more to learn. The human brain is designed to change in response to the social as much as the physical environment, slowly gaining the skills needed to become an independent and responsible adult.

Our habitat is one of relationships rather than one governed by climate and geography. We adapt to culture via the family in order to become a member of society, and this occurs on both the psychological and neurological level of the mind.

At birth a large amount of the baby's brain has yet to be wired up. The "life support systems" of the autonomic nervous system should be operating, but for the rest of the brain the connections have barely started to form. A large number of situations in utero can have negative and long-lasting effects on brain functioning, e.g. maternal stress, alcohol and drug use.

The greater majority of the neurones that an individual will have for their lifetime are present at term; however, the fibres carrying outgoing energy, called axons, and those that gather in signals from others, dendrites, are mostly not in place. These inter-cell circuits, which go on to form incredibly complex neuronal networks, are often called synapses; although strictly speaking the synapse is the tiny gap between the axon of one neurone and the dendrite of another that is bridged by neurotransmitters.

These synaptic connections take up a lot of volume, and so by ensuring that the bulk of their formation occurs after the baby is born the process of giving birth is safer for all concerned. This also means that the structure of the brain in certain key areas will be influenced by the quality of relationships and general stimulation within the family for better or for worse.

The human brain is at its most adaptable, or "plastic", during this initial period of formation. This is not to say that change is impossible at any later period of life. However, any system is easier to change during the set-up period rather than after it has been established.

The early developing brain needs appropriate input in order to create neuronal connections during the windows of opportunity afforded by the normal waves of synaptic growth. Each area of the brain in turn goes through a process of synaptic proliferation and then pruning, these sequential phases of development ensure that the correct circuits are in place to match the specific demands of the individual environment.

This is known as “experience expectant” brain growth. The brain will preserve the circuits it appears to need to adapt to a particular environment, there is a neurological assumption that this is it for life, stabilising them through a process known as myelination and discarding the rest in the interests of efficiency and available space. Brains also form circuits in an “experience dependant” manner, learning from experience, a process that never ends. A straightforward way of thinking about this is to remember the two phrases “neurons that fire together wire together” and “use it or lose it”.

If the environment is one that causes the child to consistently feel unsafe and fearful, at the worst extreme experiencing “toxic stress”, then this will be reflected in the final survival, threat-reactive, circuits of the brain. Without help such a child might go through life responding to even minor problems as if they were a dangerous life-threatening situation. Brain plasticity both makes us human and is our most serious Achilles’ heel.

The longer a child’s brain is left in a stressful setting the harder it will be to create new more benign neuronal networks and re-set the stress response; but only if they are lucky enough to be noticed and helped. But it is never impossible – it just takes a greater investment of resources and effort as time goes by.

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