



Brain Highways Basics

The Brain Highways program was created with the following mindset.

1. We have changed the way we live our lives—but the brain has not changed how it develops.

We don't often think of babies as doing hard work their first year of life, yet some of the most key neurological connections are made during this time. From a brain development perspective, there is nothing "random" about that first year. *If given the opportunity*, babies all over the world go through the same natural process of brain organization.

For example, if babies are placed on their belly, they innately learn how to creep (which looks similar to an army crawl). Such movement is directly linked to developing part of the brainstem called the pons. From there, babies get up on their hands and knees and begin to crawl. This movement is directly linked to development of the midbrain.

If a child creeps and crawls *enough*, then the pons and midbrain become fully developed. With such development, the child acquires, naturally, key brain functions that become the foundation for everything else that the child does later in life.

2. Various factors may interrupt natural brain organization.

While prenatal stress, birth trauma, neurotoxins, and genetics can all interfere with lower brain development, baby apparatus have also caused problems.

Once upon a time, babies did not have the option of spending their days on their back in infant carriers, positioned upright in a swing, or moving around in a walker. Instead, babies just spent their time on their bellies, in the crib or on the floor, and nestled against their mother's body. When such apparatus wasn't an option, we didn't have to understand that the default position for babies' lower brain development is *on their bellies*.

Perhaps you're thinking: But aren't babies happy when they're hanging out in that convenient apparatus? Of course they are—and, admittedly, parents are free to attend to other tasks when they're assured that their babies are safely confined. Yet that short-term happiness quickly fades as the child ages and is asked to do tasks that require automatic brain functions.

Also, young children of previous generations didn't spend endless hours in front of television, video, and computer screens. Rather, they were outside—building forts, creating mud pies, rolling down hills, climbing trees, and more. Such experiences were key to developing the vestibular and proprioceptive system. Although most of us have been (incorrectly) taught that we have just five basic senses, these other important sensory systems play pivotal roles in our ability to balance, focus, and move through space.

3. If babies skip over any significant stage of development, they will not acquire the same functions of babies who do complete that stage.

The brain changes with experiences. If some children only crept or crawled minimally—or skipped those stages altogether—we would not expect them to acquire the same neurological networks as children who spent the first year of life doing enough of these movements.

Yet sometimes we have difficulty believing that first year experiences could really be that important—that is, until we consider how neglect and abuse adversely affects a child's brain development. Then it's not difficult to accept that we'd expect to see differences between the brains of abused and nurtured children.

But all experiences, not just select ones, influence how the brain is organized. That's why we conclude that creeping and crawling—the main way babies move throughout their first year of life—must be important to overall brain organization.

4. If children do not complete their lower brain development, they rely on higher centers of the brain to compensate for what those lower centers were intended to do automatically.

When the brain has to rely on compensations to function, we often run into problems. First, children with retained primitive reflexes are wired to react, rather than reflect. To override such involuntary reactions, it takes a lot of cortical effort—and in reality, that's not always possible to do. For example, kids who perform well in school may melt down the minute they walk into their home if they're now "out of gas."

Retained primitive reflexes also interfere with the development of motor skills. These kids may initially try many ways to compensate to do such challenges. But they're usually no more successful than if we asked infants or young toddlers to do the same task. In other words, certain neural networks need to be in place—regardless of age—in order to develop specific motor skills.

5. It's possible for children to behave and perform well, even if their early centers of the brain are not fully developed.

Sometimes kids discover ways to compensate. Yet such kids are always vulnerable since helpful compensations may only be short-term.

As children age, more demands are made on the cortex with each new school year's curriculum. As a result, prior compensations are often no longer effective. At other times, kids' compensations only work during scattered times throughout the day. They may start out doing a task well, only to lose focus at midpoint. Or they may perform well for the entire first task, only to fall apart for the one that follows.

In short, inconsistency is a hallmark of a brain that is continually trying to compensate. In such cases, one constant dominates: Children with underdeveloped early centers of the brain can only behave and perform as well as their immediate compensations are working.

6. When we don't make a connection between lower brain development and performance, we often think such children are lazy and careless.

Children who are scolded the most for not "trying hard enough" have likely expended way more effort to do tasks than those who merely sail through them. While we have been conditioned to think that trying, again and again, ultimately yields results—this simply is not true if a child is asked to perform with retained primitive reflexes, underdeveloped lower centers of the brain, and poor sensory processing.

7. Neuroscientists no longer think the brain is hardwired; they now believe experiences can change the structure and chemistry of our present neural networks.

Simply put, this says we can positively impact brain function at any time in our lives. For kids who participate in the Brain Highways program, this means that if they didn't finish the lower brain development the first time around, then it's still possible to re-create those missed opportunities and, in turn, acquire those automatic brain functions.

8. Our human potential can be defined as our genetics *plus opportunity*.

While we don't have a say about the genetics we inherit, we can address the opportunity part of that equation. In short, if primitive reflexes are not inhibited and we have not completed the development of our lower centers of the brain, then we have not yet reached our potential.

9. Missing some or all of a developmental stage does not automatically spell doom and gloom for a child later in life.

There are variables in a child's life that can influence whether the underdevelopment ultimately becomes a significant problem or not. Yet if we have the opportunity to complete lower brain development—whether it is during the first year or later in life—why wouldn't we? After all, a well-organized brain is only going to make for an easier and more productive life.

10. Not every behavior is related to underdeveloped lower centers of the brain.

While the underdevelopment may be contributing to a problem, it's not always the only explanation for a child's behavior or performance. Socioeconomic-related issues (e.g. a child is hungry) or emotional issues (e.g. a child has been abused) may be contributing factors, or they may even be the sole reason for whatever is going on. That's why the Brain Highways program always encourages families to seek or continue other interventions that are appropriate to specific situations.

11. Brain Highways is an educational, not a medical, program.

The Brain Highways program was created to provide information, movements, and activities related to brain development. Since it's truly just an educational curriculum, it would be inaccurate to think of the program as any kind of therapy. Likewise, the Brain Highways assessment and curriculum should never be used as the basis for challenging a medical diagnosis or treatment, identifying a child with a learning disability, or placing a child in Special Education classes.