

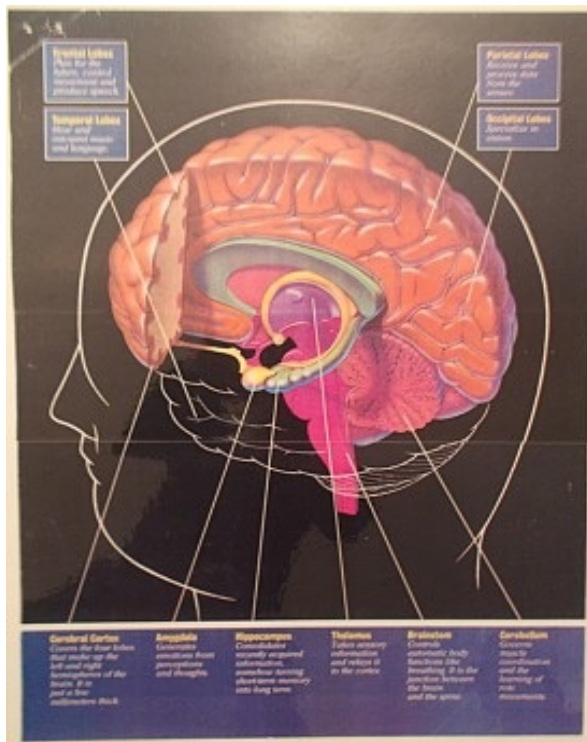
Smart Children Who Have Trouble Learning

It is probably safe to say that nearly every parent knows a child, perhaps their own, who is struggling in school. The vast majority of the time it is clear that these children do not lack intelligence. In fact, these children are clearly very intelligent, but they still struggle to use their intelligence in academic ways. Why, despite their intelligence, do they have such difficulty in reading, or grasping mathematical concepts, or understanding social dynamics? The explanations that are usually given are not very satisfying.

Children in this situation are often given various diagnoses such as dyslexic (which simply means that they have trouble reading), ADD or ADHD (which means that they have difficulty focusing on a task or seem to move around more than necessary). While it may be comforting to have a name for the problem, having a name does not mean that you have the answer to the problem.

Parents with children who are struggling in school are sometimes told that “they will grow out of it”, or “they simply need extra tutoring,” or “they have a particular learning style.” In some situations, various medications are recommended. There are also times when the struggles are simply attributed to the child’s personality, or even denied. It is very difficult to face a problem for which you have no answer.

A Different Answer



In this article we would like to offer a perspective that you may not have heard before, or have only briefly encountered. It will come with no surprise that we must start with some comments about the brain.

When we hear any mention of the brain, it is usually in terms of “right brain” and “left brain.” Several books have been written about the characteristics of people who are predominantly “right brained” or predominantly “left brained.” These terms refer to the top of the brain, called the cerebral cortex, and a person’s intelligence is usually considered a measure of how well the cerebral cortex functions.

Most of the pictures of the brain that we see are a view from the top, showing the two hemispheres of the cerebral cortex. However, if we were to look at a picture of the brain from the side, we would see that there are many structures beneath the cortex. The functioning of these parts of the brain is seldom considered when trying to find a solution to a child's struggles in school. If mentioned at all, these structures may have been called the "primitive" parts of the brain. They are often dismissed as having no impact on intelligence, but only with the automatic functions of our body. While it is true that these lower parts of the brain may not be directly related to intelligence, their ability to properly perform their functions greatly affects the cortex's ability to properly perform its functions. A child may be very intelligent, but if these lower parts of the brain are not doing their jobs, the child will have a very difficult time using the intelligence he or she has been given.

To make this last point more clear, let us consider an analogy. While many people have watched a new building gradually take shape during its construction, fewer are aware of all the inspections that are required along the way. After the general plans are reviewed and approved, the construction can begin. First, machinery is brought in to dig a hole for the foundation. Sometimes the qualities of the soil itself are inspected. The framing for the foundation is built and inspected. Then the foundation is poured and inspected. When the general framing is done, it gets inspected. Basic electrical and plumbing structures are added and are then inspected. When insulation is put into place, that is inspected.

You get the idea. Every step in the construction of a building must be inspected and approved before the next step is taken. All these inspections are required so that when the building is finished, the owner has some assurance that it will function as it should. What is interesting, and noteworthy, is that once the building is in use, all the parts of the building which required such careful attention are not even seen. All the inspected structures are within the walls and therefore "invisible."

If we were to walk into a new house, we would look at the colors on the walls, the beautiful lighting, the lovely windows and all the other external features. Very few people would immediately consider the foundation, or the framing which holds up the walls and roof, or the plumbing and electrical work which is hidden within those walls. Yet, the truth is that all those unseen parts of the house allow the occupants to live comfortably within it and add beautiful and useful features. The purpose of all those careful inspections is to ensure that the invisible parts of the house are of a quality to support the visible parts. With poor framing, or sloppy electrical and plumbing work, the owner of the house will eventually have trouble. The visible parts of a house are dependent upon the invisible parts.

In this analogy, the cerebral cortex is, of course, the beautifully painted walls, the artistic arrangement of windows, the small fountain in the entry way, and the lighting that can be adjusted in a hundred different ways. The invisible parts of a house - foundation, framing, plumbing and wiring - are the pons and midbrain areas of the brain. What is not generally appreciated, even by pediatricians, is that, just like invisible parts of a house, the pons and

midbrain are responsible for many crucial functions that are, most often, taken for granted. It is only when there are problems that we appreciate the roles they play. If the pons and midbrain parts of the brain are not functioning (that is, not doing their jobs), then the cerebral cortex can not do its job of learning. This is why we have "smart children who have trouble learning." What is true in our analogy, is true in the brain. The visible parts, or functions, are dependent upon the invisible parts, or functions.

The pons and the midbrain parts of the brain have many very important jobs to perform. If these parts of the brain are not doing their jobs, the child can not be all that they have been given to be.

Pons, Midbrain and School

The following are a few of the pons/midbrain functions that most directly influence learning and a child's life in school.

- the ability to make and maintain eye contact
- the ability to track smoothly across a page of text with the eyes
- the ability to use our eyes as a team, with both eyes looking at the same thing, as in words on a page
- the ability to stay focused on the task at hand
- the ability to "think before we act" rather than acting impulsively
- the ability to automatically maintain balance
- the ability to have an innate sense of where our body is in space
- the ability to accurately receive sensory information and correctly process it for use by the cortex
- the ability to automatically access both hemispheres of the cortex quickly
- the ability to filter out visual, auditory and tactile stimulation that is not important
- the ability to discern threatening situations from non-threatening situations

Anyone who has these abilities never thinks about them because they are what they are supposed to be, automatic. But what happens if a child (or an adult) does not have these

automatic abilities? Many of us have seen examples of underdeveloped pons and midbrain, but did not know the cause. We wondered why some children can not what should be simple tasks.

Have you ever seen a child, or an adult, use a finger to follow along a line of text and to direct the eyes to the next line? Have you seen a child hold his/her head in a rather strange position while reading or writing? Do you know a child who has persistent fears or anxieties that have no basis in reality? Have you ever been concerned about a child's clumsiness? Have you seen a child, beyond the age of seven or eight, reverse letters and numbers? Have you seen, or have been frustrated by, a child who just can not keep still, does not look at you when you speak, or keeps moving around when you speak, apparently not paying attention? Many other examples could be given, but these will suffice for our purpose.

We often consider these behaviors as either "this child's style or personality" or even as expressions of disrespect, yet all these situations may be signs that the pons/midbrain areas of the brain are not functioning as they were designed to function. If the child had the abilities listed above, we would not see these behaviors.

The abilities listed above should be automatic. We should not have to "think" about them or be taught them as some sort of special, individual skill. They should be as easy and as automatic as breathing. These are not things we learn in school, nor are they things our mother and father taught us. How then do we gain them? And why do some children, and adults, not have them?

Movement and the Brain

To answer to these questions, it will be helpful to consider the fact that we do not expect our cortex to develop its full potential without any effort. Do we expect a child to learn to read without any exposure to books and without some explanation of what those funny little marks mean? Do we expect a child to be a mathematical genius without ever exposing him to the concept of number, weight, volume, motion and all things mathematical? Does a child learn to play a musical instrument or to sing beautifully without some instruction and practice? In other words, we all accept the fact that developing the cortical abilities we have been given takes opportunity and effort.

However, most people assume, or are taught, that the lower parts of the brain develop without any particular stimulation. The fact is that, just like the cortex, the pons and the midbrain areas of the brain do require experience to develop fully. However, the type of experience, or stimulation, that helps the pons and midbrain to develop is different from the type of stimulation that helps the cortex to develop. The cortex develops through the experience of auditory and visual stimulation. This is the type of stimulation the children generally receive in school. However, auditory and visual stimulation mean nothing to the pons and midbrain. They respond and develop through the experience of physical movement.

What are the physical movements which will develop the pons and the midbrain? The answer is seen in natural childhood development. Although this article is not the place for a detailed explanation, we will give the general idea. If given the opportunity, a child will go through a series of movements which are designed to stimulate, and thus develop, the pons and midbrain areas of the brain. These are movements that are built into our nervous system as reflexes. We do not have to teach the child. In fact, it would not serve the child well to teach these movements. The struggle to move is part of the process. We simply have to provide the opportunity by allowing the child to move.

A child struggling to roll over from his back to his stomach and from his stomach to his back is not just learning a new outward skill. He is developing the pons area of his brain. A young infant lying on her back will move constantly move her arms and legs. At first, these movements are very uncoordinated, but will gradually become more smooth. A child on his back on the floor will have the opportunity to exercise a reflex called the Asymmetric Tonic Neck reflex. This reflex movement is one of the movements which help develop good communication between the right and left hemispheres of the cortex.

From a neurological perspective, the most important position for the infant is on his belly on the floor. This might sound strange to us, but a very highly respected pediatrician/psychologist of the twentieth century, Arnold Gesell, considered the floor to be the “athletic field for the child.” The floor was the place where the child could explore and develop coordinated movement. Not too long ago, allowing a child to move around on the floor used to be a standard child-rearing practice. However, in today’s society, many things have greatly reduced the time that most children spend on the floor. Consider the many modern “conveniences” like walkers, mechanical swings, car seats (which easily become “all the time” seats), and the concern that the child might get dirty, or be in contact with too many “germs”. All these things reduce the child’s floor time and thus limit the development of the pons and midbrain areas of the brain.

If an infant is placed on a smooth surface, she will eventually find a way to move, especially if objects are placed just out of her reach. Given enough time on the floor, she will gradually develop a movement on her belly, called creeping. The struggle to creep and creeping itself stimulates the pons area of the brain, causing it to mature and learn the jobs it is supposed to do. After a few months of creeping, another reflex will become active. This reflex will gradually bring the child up to the hands and knees. Now the child can learn how to crawl, a movement which stimulates the midbrain area of the brain, causing it to mature and learn its many jobs.

After hopefully several months of crawling, the child will start to experiment with standing and walking. Too often, however, the walking part of development is considered important while the creeping and crawling is considered simply what a child does until he can walk. This perspective has hampered the full development of many children.

A fair question at this point might be, “How do you know that creeping matures the pons and gives a child the ability to track easily when reading, makes it easier for him to make eye contact, relieves him from unreal anxieties, and so on? How do you know that crawling matures the midbrain and helps the child with balance, fine motor skills, memory, reading and many other things?”

The answer is that if a child, or adult, lacks one or more of the automatic functions listed above, they start to gain these functions by spending time on the floor, creeping and crawling as though they were a little child. This may seem like a wild claim, but it been shown to be true hundreds and hundreds of times over the last few decades.

Where To Get Help

Before starting St. Michael’s Orthodox School, we worked with children, using this approach. The results were very satisfactory. During the twenty years of teaching in St. Michael’s, we encountered intelligent children who lacked some of the functions of the pons and midbrain. They had reading, trouble with math, and, sometimes, trouble getting along with the other children. Those who used this development approach, did so with much success.

If a child you know is struggling to learn or lacks the automatic abilities listed above, I strongly recommend an organization called Brain Highways, brainhighways.com. They have a center in Encinitas, CA, but also offer The introductory videos are very entertaining and informative and there is much to read on the site. There are also videos on Youtube.

*James Hughes,
St. Michael’s Orthodox School*