

Balancing to Resolve Symmetrical Tonic Neck Reflex

and its Effects on Posture, Learning, Behavior and Performance

by Kathy Brown, M.Ed.

In previous articles I have described the challenges resulting from incomplete progression of infant reflexes, and how “retained” reflexes are at the core of many academic and behavior issues. Here is the story of a profound shift experienced by a recent client, using techniques from Educational Kinesiology (Edu-K) and its introductory program, Brain Gym®. For more on reflexes, please see the Articles page of my website, www.centeredge.com.

How does an infant develop the ability to get from his tummy up onto hands and knees? It’s thanks to *Symmetrical Tonic Neck Reflex (STNR)*. This reflex emerges at about six to nine months after birth. During this time, when the infant is on his tummy and lifts his head, his arms automatically straighten and his legs automatically bend, leaving him sitting back on his heels. Conversely, when he tilts his head down, the opposite actions reflexively manifest: his arms bend and his legs straighten, elevating his rear end. Over time, these movements are refined into a fluid motion that brings him up from his tummy into a stable all-fours posture, in preparation for crawling.

By the time the infant is about nine to eleven months of age, these reflexive movements will have done their work, and his head movement no longer triggers automatic bending or straightening of his arms and legs. He’s ready now for independent crawling, which learning specialists agree is the foundation for cross-lateral integration: the ability to coordinate the use of both brain hemispheres for easy learning.

However, not all infants go smoothly through the STNR stage, and vestiges of this reflex are “retained,” through childhood and into adulthood. One of the most common results of retained STNR is the inability to comfortably sit still. How could this be? Let’s explore the principle at work.

Reflect for a moment on how a child is expected to sit at his desk in school. To

sit “properly” on a chair, his knees must bend. However, the STNR pattern would then prompt him to straighten his arms. He must bend his elbows to be in the “proper” position for reading a book or writing, but this would prompt him to straighten his legs. Add to this the action of tilting his head up to see the board, and then down to focus on his work, and his retained STNR may be triggered even more.

When a child with retained STNR must sit with arms and legs both bent, he often ends up uncomfortable, agitated—and potentially labeled as hyperactive. In fact,

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the authors of *Stopping Hyperactivity—A New Solution* describe “immature STNR” as a prime cause of ADHD diagnosis.¹

As a career K-6 educator, I can attest to being utterly mystified by the odd postures children would assume at their desks. Some wanted to read or write slumped over, with their arms out straight in front of them. I would constantly remind them to “sit up straight and put your paper (or book) right in front of you.” Others persisted in sliding down

¹ For many children with retained STNR, certain standing activities may be as challenging as sitting, since in the typical “arms at your sides” position, arms and legs are both straight. Such children may benefit from an adapted standing position, with “hands resting on opposite elbows” (legs are straight, arms are now bent).

in their chair with legs straight and angled out in front of them, even finding something to use as a footstool. I would tell them to “put your feet under your desk.” Little did I realize that these students had gravitated into the only postures where the strain of Symmetrical Tonic Neck Reflex would be relieved, and they could actually do what I really wanted them to do—focus, read, write, and learn.

I see now that these children were very creative problem-solvers. It was only my lack of understanding that prevented me from appreciating their behaviors as a search for release of inner tension, from what I call “the pull of the invisible puppeteer” that results from retained reflexes.

Here are some of the behaviors that may result from retained STNR:

- agitated and unable to focus when sitting for any length of time
- more comfortable when standing
- when sitting, prefers postures that allow legs to be straight
- on the floor, prefers “W” sitting, with feet tucked back on either side
- poor eye-hand coordination
- poor at sports, especially swimming (raising head to breathe causes arms to automatically stiffen)
- difficulty copying from the board (rapid adjustment of near to far focus)
- muscle tension in neck and shoulders
- legs on the move, or twisted around chair legs
- skipping the infant crawling stage².

Numerous educators I’ve talked with describe what they see as a “growing epidemic of hyperactivity” in children. Could it be that many more children than ever before have retained STNR? And if so, where could this be coming from? I have a theory: some infant-care practices adopted in recent decades prevent children from being on their tummy as much as was historically the case.



A generation ago infants spent huge amounts of time on their tummy—both sleeping and playing. With the “back to sleep” movement (recommended by doctors to reduce the chance of SIDS, Sudden Infant Death Syndrome), parents now consistently position infants on their back for sleeping; over-cautions parents may translate this into a practice of *never* putting infants on their tummy. In some cases, infants even end up with “positional plagiocephaly”—they are positioned on their back so much, the back of their head actually becomes flat from constant contact with the surface beneath it.

Then there’s the prevalence of baby carriers. The development of infant car seats is an incredible boon for infant safety. However, because car seats now come with handles, parents have begun carting their infants everywhere in them. One mother I talked to realized that her son had been in his baby carrier for more than *eight hours* that day, what with her commute, many errands, lunching with a friend—and simply setting the baby in his car seat next to her desk while she worked. These carriers have become a convenient means of managing infants. Is their over-use preventing infants from getting the tummy-time (not to mention vital human touch and variety of physical movement) they need?

If an infant is seldom on her tummy, she may not have the time (notice I say “time,” as opposed to “occasional opportunity”) required to explore her world from a tummy-down position:

- What does it feel like to orient myself this way?
- How is my view of the world different from this position?
- How is the pull of gravity different, and what does it take to raise my head?
- How different is it to feel the solid earth under my tummy?
- How can my body move when I’m on my tummy? (lifting arms and legs to “fly,” and more)

² For infants with retained STNR, attempts at crawling can be frustrating. When they look up, arms stiffen, legs bend, and they must sit back; when they look down, arms bend and they do a nose-dive. In either case, they get nowhere. Such children may give up attempts at crawling altogether, or develop “different” means of all-fours movement, such as backwards or sideways.

All of these experiences build vital aspects of her relationship to the world around her, creating an integrated developmental foundation for new movement patterns.

Then, six to nine months after birth, the Symmetrical Tonic Neck Reflex emerges, and when the infant raises her head she automatically pushes up with her arms; eventually her legs bend as well, and she’s soon up on all-fours, as described in the beginning of this article.

I wonder: If a child never has sufficient tummy-time, is it even possible for her to appropriately engage the STNR, rise onto all-fours, learn all the vital brain-wiring lessons from months of cross-lateral crawling—and, then, appropriately graduate to walking? Will her mind-body system be waiting a

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lifetime to fully “use” the STNR, so this reflex pattern can be incorporated into more mature, intentional movement, as the “trigger” for this reflex simply fades away?

Time, and research, may tell. In the mean-time, however, our world is full of children (and adults) who daily experience the stress of retained STNR. How much better it would be if intervention was never needed in the first place. But I’m grateful that STNR often responds quickly to specialized Brain Gym/Edu-K processes.

I recently worked with “Ronny,” a very bright, likable boy, whose teacher was amazed (and frustrated) by how agitated he was when sitting, and how poor his focus was. Now in eighth grade, Ronny was still struggling to achieve academically. I had worked with him several times over the last few months, addressing different aspects of reading and focus, and after each session he showed progress. However, he still

lacked the ability to sit quietly and work as well as was necessary to succeed at that grade level.

As our sessions progressed over the weeks and months, perhaps as a direct result of the way Brain Gym processes foster inner noticing, Ronny became a very good observer of his own state. One day he commented, “You know, I think I’m smarter standing up.” What a revelation! I asked for more details, and he continued:

“When I sit down, I can’t focus at all. I’m much happier standing. At home, I’ve found the best place for me to do my homework is standing and using the ironing board as a desk.” We created a goal for his balance, which was to “sit comfortably while I focus and learn.” Not surprisingly, of all the processes available on my Brain Gym/ Edu-K learning menu,³ Ronny was drawn to one that addresses Symmetrical Tonic Neck Reflex.

This made so much sense! If Ronny had a retained STNR, he would feel agitated when sitting with both his arms and legs bent. Standing at the ironing board, his legs would be straight, but his arms would be bent so he could hold a book or write. He had found the perfect physical posture to relieve himself of the pull of the invisible puppeteer.

I led Ronny through some pre-checks to determine if STNR was present. One involved seeing if he experienced stress while sitting or standing. (This was determined through the Applied Kinesiology process of “muscle-checking,” which challenges the ability of a muscle to “hold” in certain positions, revealing aspects of systemic stress.) When seated (legs bent) he was stress-free only with his arms straight; when standing (legs straight), he was stress-free only with his arms bent. No wonder he felt so agitated when he had to assume a typical seated posture!

³ Since Brain Gym and Edu-K are built on the “drawing-out” model, the facilitator does not “diagnose and fix,” by observing behaviors and then selecting a certain technique for the learner. Through various means of noticing and choosing, the learner will find himself drawn to a specific balance process from a “menu” of available processes. It never fails: the learner is always drawn to the “perfect” process to resolve his or her own challenge, in essence selecting his own path to wholeness.

The process Ronny had chosen from the learning menu was Total Core Repatterning, a technique developed by Dr. Paul Dennison (which he teaches in a course by the same name). Following this process, we rechecked Ronny's postural stresses. While these checks did not indicate that the reflex was completely resolved, they showed there was great improvement.

Following this session I had a discussion with Ronny's teacher. I explained to him how a retained STNR results in the inability to sit still and focus, and how he could help Ronny learn more easily by creating a space where he could do his work standing up, perhaps in the back of the room. Ronny's teacher immediately grasped the concept and created a "standing work space" by placing a box on top of a table, to position Ronny's work at just the right level for him. He also gave Ronny permission to move from his desk to that standing work space as needed.

When I worked with Ronny again two weeks later, he was excited to report all the positive changes he'd experienced


since our last session. He was very pleased that his teacher was allowing him to stand at the back of the room to do his work, but said that he didn't always need to, and that sitting was much more comfortable than ever before. He also said that he has much better comprehension when he reads, and is even passing more tests. He had just received a social studies test from his teacher, and had earned 100% on it. We definitely celebrated all these changes!

In this session, Ronny wanted to continue his focus on sitting comfortably. The postural prechecks from our last session still showed a stress response, and Ronny again chose Total Core Repatterning from the learning menu.

This time when we were finished, his post-checks were solid: sitting or standing, he showed no stress at all, whether his arms were straight or bent. He was delighted!

Three weeks later, both Ronny and his teacher reported that he is much more able to sit still in the classroom, and his focus has improved as well. Ronny

told me that he no longer feels the need to stand or move around in order to concentrate; he is perfectly comfortable and focused doing his homework sitting at a table. He no longer has to stand while reading and writing, because the former agitation from sitting is simply gone.

Ronny will still benefit from additional sessions to address other areas of learning challenge, but this STNR shift will certainly go a long way toward providing a new, more integrated foundation for all his future changes. 

Recommended Resources:

- *Learning, Reflexes and Behavior: A Window Into the Child's Mind* by Sally Goddard
- *Stopping Hyperactivity: A New Solution - A Unique & Proven Program of Crawling Exercises for Overcoming Hyperactivity* by Nancy E. O'Dell, Ph.D. and Patricia A. Cook, Ph.D.
- Several courses in the Edu-K curriculum address STNR and other reflexes. The specific course mentioned here, Total Core Repatterning, is open to graduates of Brain Gym® 101 and Edu-K In-Depth. See www.braingym.org

Interesting side note – Since writing this article I have come across coverage both on ABC News and in *The New York Times* of schools in 18 states introducing "adjustable height standing desks" into the classroom. The primary goal of the teacher who began this trend was to address childhood obesity by allowing students to be more active. Teachers are already noticing improvements in behavior, focus, and the ability to perform academically. I wonder how much of this change comes from the fact that children's STNR is not at issue when they're standing to do their work? See "Students Stand When Called Upon, and When Not," at www.nytimes.com, and "Facelift for America's Classrooms" at www.abcnews.com.