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## ***Why Waldorf Works: From a Neuroscientific Perspective***

By Dr. Regalena “Reggie” Melrose

Why Waldorf works has more to do with how the brain develops and functions optimally than Rudolf Steiner ever could have known. Sure the educator and founder of Waldorf Education theorized convincingly about how children learn best, but until MRIs and other sophisticated measures of the brain were developed, we had no way to prove or disprove any of Steiner’s theories, not with the kind of precision and accuracy we can now. An overwhelming body of evidence from the last 20 years of neuroscientific inquiry supports Steiner’s theories, including some of the most fundamental foci of Waldorf Education.

Three foci thrill me the most, both as a parent of a Waldorf student and as an international speaker on the topic of learning, behavior, and the brain: holism, play, and nature. An emphasis on all three is consistent with how the brain learns best: when the whole brain is engaged at any given moment, when its foundational neural connections have been given ample time to develop, and when it is in an optimally aroused state.

Knowing how the brain develops is essential to understanding why these three foci are so important to the success of any educational program. Let us first learn some basic fundamentals of the brain. First of all, it is “triune,” that is, it has three parts. More importantly, not all three parts are fully developed at birth as we once believed. In fact, very little of a newborn’s brain is “online” and “ready to go.” When the brains of newborn babies are observed with an MRI, the only part of the brain that is lit up or active is the most primal part - the brain stem, sensing brain, or “animal brain,” as it is also called. (Small underdeveloped parts of the auditory and visual cortices are the only exceptions.) This primal part of the brain is responsible for our experience of arousal

and stress. It kicks into high gear and mediates our fight or flight response when needed. I like to call it the “sensory brain” because it only speaks the language of sensations, the only language that most consistently enables our survival. When we encounter a bear in the woods, for example, our words will not save us, but our heightened senses do.

The second and third parts of our brain - the limbic, feeling brain and the neocortex or thinking brain, respectively - only begin to develop after birth. This is critical new knowledge that provides a compelling answer to the long, highly debated question of nature versus nurture. We now know that because we only have use of a very small part of our brain at birth, the brain is literally sculpted by the experiences we have interacting with others in the environment. It is not until 3 to 4 months of age, when the feeling brain has become activated by experience that newborns are able to express more than just states of distress or contentment, as it does with only the sensory brain. At this somewhat older age, babies can share a wide range of emotions, thereby giving us a more social baby.

The third part of the brain, the neocortex, thinking brain, begins to develop after the limbic, feeling brain. Indications of this maturation include babbling between 6 and 9 months, a first word around the age of 1, and 2 to 3 words strung together by the age of 2. Whereas sensations are the language of the sensory brain and feelings are the language of the limbic brain, the neocortex speaks the language of words and mediates all of what most educators value. For example, the neocortex mediates impulse control, the ability to plan ahead, to organize, and to understand that a choice we make now may continue to have consequences later. Empathy for another is mediated by the neocortex, as are our abilities to use reason, logic, and logic. We think and analyze with our neocortex, and of course, understand and have use of both receptive and expressive verbal language. If you’ve heard about “right brain” versus “left brain” functioning, it will make sense to you now that it is the neocortex that controls the functions of the left hemisphere whereas the sensing and feeling parts of the brain control the functions of the right hemisphere. The brain operates optimally when all its parts are equally developed, valued, and

engaged. Why Waldorf works is because it does just that.

Steiner's approach to education was a holistic one. He recognized that our senses, feelings, and cognitions must all be actively engaged at each stage of development in order for students to maintain, over the long term, a joy and love of learning. Waldorf educators do not make the same mistake made by a number of other more traditional, conventional, and mainstream models of education. Waldorf educators do not overvalue the development of the neocortex and left brain to the exclusion of the right brain, that which senses and feels deeply. It does not focus at too young of an age, before the brain is ready, on purely academic endeavors that attempt with rigor to engage a part of the brain that the child has little access to, the underdeveloped neocortex. (The neocortex is not fully developed until we are in our mid- to late twenties!) Instead, what Waldorf educators do successfully is involve and nourish the sensing, feeling parts of the brain, those easily accessed by young children, so that essential foundational neural connections needed for later academic learning are solidly laid.

Let me expand: You now know that the brain develops in a hierarchical fashion from more to less primitive, from the animal to more uniquely human. What that means is that the healthy development of the more sophisticated neocortex **DEPENDS** upon the healthy development of the feeling, limbic brain which **DEPENDS** upon the healthy development of the sensory brain. The problem with today's mainstream educational models is that they want the brain to walk before it can crawl. Well, let's be accurate: Most school systems today want children to **RUN** before they can crawl. We encounter proud parents who say, "My child was walking at 9 months! She didn't even need to crawl, just up and went! Isn't that terrific?" And what I want to say is, "No! No, that's not terrific! Push her to the floor! Make her crawl!" That might be an overzealous reaction, but it is grounded in sound knowledge that every single stage of development is essential to the next, laying a neural foundation to support what is to come. Our children need ample time and practice to "marinate in their mastery," of one

skill or another, at each and every juncture of their development. This is not happening in enough schools across the country today, but it is happening at Waldorf.

Take the case of play. From the very beginning of a child's educational career at a Waldorf school, he or she is supported to play in a variety of different fashions and settings throughout the entire school day. Steiner knew that play is the invaluable foundation for any kind of healthy, human growth, including academic progress. And let's be clear about what kind of play this is. It is what Dr. David Elkind calls "the purest form of play: the unstructured, [spontaneous], self-motivated, imaginative, independent kind, where children initiate their own games and even invent their own rules." This kind of play, he warns us, is disappearing from our homes, schools, and neighborhoods at an alarming rate with great cost to the health, well-being, and achievement of our children.

Numerous studies have shown that play at every stage of development improves IQ, social-emotional functioning, learning, and academic performance. The findings of several studies conducted over a 4 year period found that spending one-third of the school day in physical education, art, and music improved not only physical fitness, but attitudes toward learning, and test scores, according to Dr. Elkind. Furthermore, when the performance of children who attended academic pre-schools was compared to the performance of children who attended play-oriented preschools, the results showed no advantage in reading and math achievement for the "academic children," but did show that they had higher levels of test anxiety, were less creative, and had more negative attitudes toward school than did the "play children."

This is precisely the point we are missing in today's achievement-driven culture. We have bought into a myth in education that "more equals more." A formula of more time spent on academics, starting earlier in development, with more homework, is not increasing the output of our children. It's decreasing it! Cutting time out for the arts, physical activity, and time in nature, so our children can spend more time reading, writing, and doing arithmetic is not the answer. It is the culprit. Our children are burning out and dropping out at catastrophic rates not just because more doesn't equal more, but also because it equals shut-down.

The brain functions its best only when in an optimum state of arousal. Our children cannot attend, listen, process information, retain, or perform well when in an either under- or over-aroused state. Overwhelm is what causes these states. When before the brain is ready children are exposed to and required to participate in academics, media, technology, and organized play, such as team sports, the premature and often prolonged stress they experience can eventually shut the system down. Teachers all over the United States and Canada tell me they see "it" by the beginning of third grade. In far too many of their students, they say "the light has gone out." The joy, curiosity, and wonder that are essential to the learning process are already dulled by too much of one thing and not another. Whereas the mainstream educational system today focuses almost exclusively on academics, a mostly left brain function, Waldorf educators focus more on the whole brain, emphasizing the right hemisphere at each stage of development. Steiner could only have observed and therefore hypothesized that this keeps our children in the optimum zone of arousal where all of learning and adaptive behavior are possible. With current scientific

findings, we now know he was right. Tapping into the sensory gifts of the right hemisphere provides the “flow” necessary for the marathon of achievement, not just the sprint.

Now that we’ve learned about the importance of holism and play to the learning process, let us consider the invaluable role of nature. A given within education is the engagement of the left brain. Learning almost always involves a verbal, analytical process. What is not a given, is the stimulation and expression of the right brain. The functions of the right hemisphere of the brain have somehow been deemed less important to the achievement and ultimate success of our children, at least “success” as most define it in the U. S. Our bodies are supported to move less, our minds to race more. Cuts have been made not only to recess and physical education, but also to creative endeavors such as theater, music, and fine art, all of which make important contributions to the optimal functioning of the brain, achievement, AND success no matter how you define it. What does nature have to do with it? A whole lot, according to the neuroscience: nothing stimulates and resonates with the right brain more powerfully, and therefore, nothing keeps us in the optimum zone of arousal better than nature.

Remember, the optimum zone of arousal, when anxiety is neither too high nor too low, is the only physiological state within which all of learning and adaptive behavior is possible. Nature beautifully promotes that state. According to years of research recently compiled by Dr. Eeva Karjalainen, natural green settings reduce stress, improve mood, reduce anger and aggression, increase overall happiness, and even strengthen our immune system. Nature is one critical antidote to the increases in stress, overwhelm, burnout, and dropout we are witnessing in the

educational system today. Lack of exposure to nature causes such a detrimental state to the brain, and is so pervasive today we have a name for it: “Nature Deficit Disorder.” Dr. Karjalainen reports that “after stressful or concentration-demanding situations,” we do not recover nearly as well in urban settings as we do in natural ones. When we experience nature, our blood pressure, heart rate, muscle tension, and level of stress hormones all decrease faster than when we are in urban settings. In children in particular, we know that ADHD symptoms are reduced when they are given the opportunity to play in green settings.

As a mother myself, I can’t imagine a parent on earth that doesn’t want all of these benefits and more for their children. I can’t imagine that once parents and educators know the research findings pointing the way to optimal brain functioning, that any of us would ever agree to the kind of educational system we have now. The alternative of Waldorf exists, and I am grateful. I urge every parent to learn more about it and strongly consider it for their children. I am also aware, however, that not every parent has access to a Waldorf school for financial, geographical, or other reasons. For those parents and all of us really, I have an additional urging, that we vote, petition, write letters, make calls, and fight however we can to ensure that the reform about to take place in the current educational system be founded on the invaluable neuroscientific findings of the last 20 years. We must demand changes that are backed by sound science, based on how we know the brain works best, not just in the short-term, but for all the years to come.

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