



The Aesthetic Brain:
*Song, Dance, Perspective, and
Shape*

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Epistemology – Asks the questions.....What is truth? How do you know?



Ontology – Asks the questions.....What is real? How is reality known?

Axiology –Asks the questions of Ethics.....What is good, right, and noble?

and the questions of Aesthetics.....What is beautiful? What is pleasurable?

Aesthetics shares baseline characteristics with the brain. The brains of the young are *dynamic, outreaching* and *actively seek ideas and ways to understand place and meaning*.

The arts are the property of the dynamic brain. To be aesthetic is to join the quest to know what can be known by applying perspective, color, motion, shape, and line to what is experienced. More intellectually challenging than mathematics or science, the arts are always in the process of solving problems that come to the conscious enterprise of the artist.

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As brains age they become more static rather than dynamic. The static brain has begun to know rather than wonder. Often seeking is about confirmation of closely held beliefs and understandings.

Exploring the world to discover the essence of truth and reality is the challenge of the person who sets aside static thought in favor of seeing the world not only what it is but also what it might be. For the dynamic artist, just as the inspired scientist, truth is found in the search not in the result.

Art is an attitude rather than an object. The reality of art is found in the space between the painter, her brush and canvas, between the dancer, her kinetic self and what she hears in the music that is playing. For the actor the authenticity of truth is found between himself, the script and the character he is becoming; for the musician, the beauty of art is found between herself, her instrument and the score.

So what is going on the brain of the artist? The process is an electrical brainstorm with millions of cells firing, neurotransmitters flowing, and brain segments sending encoded messages back and forth. While the outward signs may be few, the *feelings* of the inner self provoke emotions rooted in the latest moment of life to the awakening of ancient cells that transmit to this brain in the DNA. Floods of language and image after images come to mind to direct the artist's consciousness toward a likeness of what he intends to organize "out there" for others to experience.

In the language of neuroscience we call this brain state *plasticity*. Brain plasticity refers to the condition of the brain that opens it up to produce different thoughts, new ideas, to consider the unusual, to construct a temporary logic that is, perhaps for just a moment in time, a way to experience what may have never been experienced before. This is the human brain at its zenith of performance and organization---perhaps shared, perhaps

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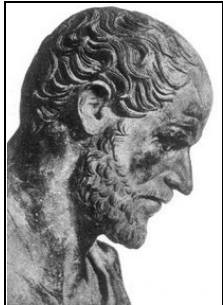
not. Here is the moment that Abraham Maslow called *Peak Experience*.

You are now asking, how does one organize a brain to take them to the possibility of discovering the aesthetics of peak experience? There are models for this aesthetic discovery strewn all through history---from hundreds of years ago, all the way up to yesterday. How is it that one can become a creative, aesthetic person or, at the very least, a person who can improve the way she perceives the world around her? Can it be done a result of education, of teaching, of life experiences? Is there a map or a book of instructions for making this journey?

First, let's start with the brain itself. There is so much to say about the brain that it is impossible to do it in a set of well chosen words. To know the brain, about the brain, is a process that requires hours of study and even more hours of knowing the meaning of what is understood. The brain is a maze; finding the right starting point to launch this study will not guarantee coming out where you expected you might.

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So this brief paper is Brain 101 for those who are interested in knowing about the brain. First, the brain is an aesthetic organ from the start. It is a complex center for everything we know and have known. The brain has a history that dates back to the very beginning of human existence. A summary of brain history in concise terms goes something like this. During the time of Aristotle (384-322 BCE), the brain was taken to be a radiator that kept the all important heart cool. (The heart, at the center of the body, was known to the Aristotelians as a "hot" organ.) All of the passions of human experiences were in some ways related to heart function. That notion was taught all across the world though we are not sure what was being taught in China. We continue to celebrate the heart as a repository for our emotions in our music, poetry and



Valentine's day.

Then there was a man called Nicomachus who lived in Pergamon now called Turkey. One night he dreamed he was visited by Asklepios who demanded that he require his son, Claudius, to attend the asklepeion and study medicine. In those times dreams were taken to be guidance councilor for vocational training.

Nevertheless after this nocturnal visitation, Claudius was gripped by the desire to study medicine and after some years of aggressive work and study he became the most influential physician in history. His thinking dominated

The Asklepeion is a famed ancient medical center built in honor of Asklepios, the god of healing. It was also the world's first psychiatric hospital.

medical thought and teaching for a millennium. In spite of his aggressive and driven nature he came to be known as “Galen” or “the gentle one”.



The story of Galen is an inspiring drama that includes his importance to human thought and his contributions to the fields of biology and physiology. As well, his practice of careful clinical writing became pivotal to medical knowledge. So insightful were Galen’s findings that much of his work continues to serve as the basis of anatomical study. You have probably guessed by now that Galen took much of Aristotle’s thoughts to task and came to very different conclusions. Galen held that it is the brain that is the center of how human beings confront knowledge, time, and personal experience.

The brain, rather than the heart, is the receptacle and generator of thought and action. The brain must have the respect bestowed on it by Galen and reflected in the legislative declaration of the 1990s as the *Decade of the Brain*. In fact, in 1989 the United States Congress granted \$20 billion to study the brain. The brain is the only organ to be studied without designation of a specific disease or condition at the center of the research.

So what is this thing we call a brain that is the intermediary of our dreams, hopes, sorrows, and loves? It has a personal character and a public demeanor. The brain drives our desires, measures our abilities, and monitors all of our vital signs. It is not just what we do but it is who we are and, with such complexity, that some things about us are literally hidden from us.

Time and space limits what I can teach you here and now, so I am going to make just five points about the brain and aesthetics. These five matters are in the “orthodox-box”. You may “try them on” in the context of your experience and see how they fit. Perhaps we will meet another time so that I can add more information for your consideration.

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Point 1: The brain is dependent in developing a language with which to think and communicate. Having a language provides a link to all other like-speaking brains. Having language offers the capacity to explain where you are, who you are, and to ask are you not your brother’s keeper? The brain is in a never-ending search for that information and our very lives depend on what we come to know. Our language potential allows us to describe what we are experiencing to others and to test

whether what we experiencing is consistent with the experience of others or, if we are different and alone. The reality we come to know is composed of information from the sensorial. These data are interpreted by our experiences that then allow us to fit into what we call community. It sounds easy when put like that, but for the brain this is a process of bringing thousands of bits of information to make a picture of what is going on around us.

Without language to communicate with ourselves, we are disabled from the communities growing around us; we are unable to participate in the experiences of our neighbors. From the moment of birth, adults begin talking to their infants in some sort of DNA-driven ritual that starts the language acquisition process. Studies show that children who come from language-rich homes speak earlier, read sooner, and are more competent in determining what is going on around them.

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Language is one of the primary ingredients of what we call intelligence. Because of the extraordinary quality of brain research we now know ways to teach language arts and reading better and faster, with greater expectations for longevity than ever before in human history. These protocols are available to pedagogical sciences; few are aware of their existence.

Point 2: The arts and education have a traditional relationship that has had a difficult time surviving pragmatism. The Greeks felt that art, music, poetics, and drama were fundamental to learning and to coming to know. In nearly every culture, basic education has evolved around the arts and the existence of civility has very often been measured by the quality and sustainability of the art that people in the culture created.

We continue to be attracted to crude drawings on cave walls, the meticulous lettering on the Dead Sea Scrolls, the frescoes of the spirit of humankind, art works that came out of the Renaissance, and the everlasting music of the classical period. In a variety of ways these examples of art call to our baseline humanity and remind us of who we were and who we are. At this moment classical education is anchored by the arts as a way to set the stage for advances in philosophical thought to bring us closer to Truth, Reality, Ethics and Aesthetics.

The common era of teaching and learning changed the focus of knowing from being educated to being prepared. There is a fascinating story told in that transition that should be read by those of us who are trying to find the answer to the question, "What happened?" As a hint I mention the industrial revolution, urbanization, and the veterans of world wars.

Thoughtful people can argue, and for decades have argued, the merits of the educational revolution. John Dewey has been both celebrated and vilified as the designer of *progressive education*. This movement was, in fact, set in motion long before Dewey wrote *Democracy and Education* (1916) and before that, his extraordinary piece of educational writing called, *My Pedagogical Creed*, (1897). However, those two writings became the intellectual signposts of the progressive movement.

It wasn't until 1934 that Dewey published his *Art as Experience*. To the surprise of the players in the progressive movement, Dewey strongly suggested that aesthetics and art were critical to experiencing. He said that having an aesthetic temperament was the only way fully to know about experiencing the world. It was too late. Progressive thought had become so practical in its orientation that the Art of Experience was left out of the

bibliography of “the pragmatic movement”. The time for elementary school teachers becoming qualified for their jobs by being able to play the piano, teach art, and lead children in dramatic play had passed. There was now a music teacher down the hall in the music room right across from the art teacher in the art room. In spite of valiant efforts, the arts were out of the general curriculum and pronounced as frills, “not practical” by Boards of Education all over America. To read about this critical period in the life of American education, I urge you to read *Changing Schools: Progressive Education Theory and Practice, 1930 to 1960* (Zilversmit, 1993). While it is not a quick read, it is a complete history.

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Even though the progressive movement had a very strong component of child study and child psychology, most of what was thought was based on practical things for and with children that ultimately taught them to be productive citizens. “Teach the whole child” became the mantra that is still heard in schools of education. It remains a very good idea; but the question is, teach the whole child what and how?

Point 3: Enter neuroscience and cognition. In the last decade more has been learned (discovered) about the brain than in any time of the history of brain study. Information derived from hundreds of neurocognitive studies has changed the landscape of what is known about teaching and learning. Studies have revealed new, dynamic and powerful insights about the acquisition and retention of information. Books and articles have shed new light on the process of education and offer the possibility of revolutionizing pedagogy and bringing the art of teaching into the new millennium.

Conclusions from some of the studies are written in a language unfamiliar to educators. Some findings are so contradictory to what educators believe about how and what to teach that tradition will not allow serious consideration of the data. You in this audience and the ancient Greeks will, however, be pleased and not surprised to hear that the brain has been found to be aesthetic, metaphorical, and quite private and personal.

School settings have not changed in 200 years. Chronological age grouping remains the primary method for grouping children. Most educators haven’t the slightest notion of how the brain converts what has been learned to what it knows. Learning about neurocognitive teaching and learning requires one to think about the brain from the inside out.

I want to direct you to sources to study to learn about how we have come to think about cognition. Daniel Levitin’s (2007) *This is Your Brain on Music: The Science of Human Obsession* takes us from Bach to Basie to teach us that music is critical to cognition and learning. Brain function pivots on steady beat and music is so integrated into brain function that to teach without an awareness of what music does to/for the brain is close to folly. The human body is from the beginning is seated on tone, articulation and rhythm. Music and dance are “natural” for the learning child and fundamental in bringing the brain to know.

The neurocognitive elementary teacher certainly should integrate the work of Dr. Robert Abramson into the physical preparation for learning. Eurhythmics teaches a series of perceptual and cognitive experiences which have their roots in one of the most important theorists in the history of the education of young children, Johann Heinrich Pestalozzi. Dr. Abramson has written several books as guides to offering children Eurhythmic musical and coordination games designed to shape attention, perception, and improve cognition. His book, *Feel It*, is a wonderful resource for teachers and should be part of preparation for attentiveness and focus in all levels of learning. Eurhythmics is a critical aesthetic experience for children.

Related to the aesthetic physical preparation of children for learning is another coordination and preparation program known as BrainGym. BrainGym is best outlined in a book called *Smart Moves* written by Dr. Carla Hannaford. Of particular importance is the part of the BrainGym protocol called the “Dominance Factor” which should become part of every reading program. Macon/Bibb County has its own BrainGym specialist, Pam Webster. I urge you to discuss these important skills with her. Pam is widely known for her work with teachers across the country.

It is important to note here that in several recent studies, including one by the National Reading Association, it has been shown that 40% of all reading deficiencies are marked by problems with physical and sensory coordination. The most efficient and effective way to treat these problems is by re-skilling the child’s vestibular/sensory system. The two systems are organized and located in the same regions of the brain. The only way known to date to tune-up the vestibular system is for children to be involved in dancing, running, hopping, skipping, and jumping. It is a general rule that if a child can’t skip she can’t read.

The founder of school-based physical education, Delbert Obertoffer, insisted that physical education be a central part of the education of the whole child. Obertoffer envisioned physical education teaching children to balance, to move with flow, and to be adept at ordination and coordination. There is no question that if there are problems with physical skills, the cognitive skills of the child are likely to be limited. When I hear that schools are cutting physical education and recess time, it appears that leadership does not understand that all learning proceeds as both a neurocognitive and a physical process. Remember please, music, dance, drama, and physical skills have been part of what it means to be educated.

Point 4: Because of television, cell phones, iPods and other personal technologies, the art of storytelling is fast becoming a lost art. Maybe even more destructive is the lost art of listening to stories. It is not that we aren’t making noises, we are. Much of the noise is not constructed to be listened to, only to be heard. This is the point of my discussion about listening when my grandchildren roll their eyes and put their iPod buds back in their ears. It does sound sort of old-fashioned, doesn’t it?



So quickly, here is the brain truth. At a young age the brain is preparing for every imaginable experience. This is done by the activation of a system of neurotransmission from brain segment to brain segment. The neurotransmitter is called dopamine. Dopamine cells are the cells that cause or allow us to understand. Knowing what we know has dopamine written all over it. Just for now trust me on this one.

The brain has to tell us what is going on out there. It has to tell us what is real and not real and it has to tell us if we are moving in the world or if the world is moving around us. Not only is this physical, it is emotional as well. We have to know if we are interested in what is going on and we have to know if---maybe most importantly---“Is it it or is it me?” And all of these questions have to be asked and answered in milliseconds. The sort of scientific answer as to how we do it is, by experience.

Now it is true that the brain is not very good at remembering. It is, however, exceptional at making it seem like we remember and not only that it seems to us as though we remember just like it was yesterday. Well, if it did happen yesterday you probably should not trust what your memory is telling you. Memory and emotion are inextricably connected. Without memory there is no emotion and without emotion there can be no expectation.

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So here is the point, we remember our experience not for what we took away from it. What it does for us is to provide a template or map for understanding when something “like it” happens again, and again, and again. This suggests how we can say that we learn from our experiences. Dopamine cells rush into brain tissue to offer us interpretations of our experiences both real and imagined. So we can say that the quality of our comprehension is based on our ability to imagine. Read a book called, *Making Up Our Minds, How the Brain Creates Our Mental World*, by Chris Frith.

Education can be thought of as a means of getting the brain prepared for organizing itself for knowing about what was and what is to come. We are always in the process of telling ourselves a story about what we are doing. It just follows that hearing and telling stories is the foundation of all learning. Remember it is said that God created so many different kinds of people because he likes good stories. The limits of the subject areas, the disciplines, the content fields are marked by the stories each one tells. Storytelling and drama ought to be in the midst of all curriculum initiatives---for everything human is part of being human.

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Reader’s Theater is a way to inspire reading, promote comprehension, and also give children a chance to be actors. Participation in acting experiences are vital in helping us learn to pay attention and see and hear about ourselves. Acting is one of the most celebrated activities in all of the arts. If you want to know more about more about the

brain---drama relationship, read a thrilling book called, *The Bard and the Brain*, by Paul Matthews. There are parts of this book that are magical.

Point 5: Maybe the first person to discuss the neurology of aesthetics or what has come to be known as neuroaesthetics is a man called Semir Zeki. His book, *Inner Vision*, is a triumph in bringing together art and science. Part one of his book, *A Function of the Brain and Art*, has become a testament to the melding of the mind of Science and the mind of the Arts.

Teachers now have an opportunity to rethink how they teach and how children learn. The jury is in, the brain functioning of the child determines what sort of learner she will be. School has to be authentic to the life the child is living. In 2007 over 40% of the kids who dropped out of schools in this country testified that they gave up because what they were being taught was not about them.

Children and the spirit of children learning can be found in no better form than in art, music, dance, literature, and drama. The nature of us all can be found in these disciplines. In each of the aesthetic arts the student of that art, regardless of age, is confronted by problems to be solved with questions to be asked. In the arts, students are not given solutions to problems or answers to questions. It is time we get past having our children study endlessly the answers to questions that have already been asked and answered.

In my work I have been teaching both teachers and children with robots---robots they must teach. The reactions have been startling. A couple of robots have changed the whole nature of the school. In a second grade classroom, a child was working with a robot. She put him down and walked to the teacher and said, "He just said something to me." The teacher replied, "What did he say?" The child answered, "I don't know but I think it is important."

In a middle school social studies class I visited a teacher who was having his students list and discuss what qualities the personality and character of their robot should have. History, philosophy, and the art of living were on the table while a not yet intelligent robot was walking around the room waiting to be taught. As I was leaving the room one of the children was saying to his classmates, you people have not suggested one thing about what this robot's family might have already taught him.

Robotics and nanotechnology are only part of a collection of topics every classroom can adopt to change what it means to know and how to know it. Neurocognitive teaching and learning proposes to make traditional subjects more efficient and palatable and to bring the brain to meet the problems we live with today. Think of it, we are living in a time when people are trying to live long enough that they can live forever. Kindergarten children will doubtless live at least 100 years. Are we teaching them how to live thirty years longer than our present retirement age? The responsibility of teaching has shifted from teaching children what they need to know to make a living---to how to know what they will need to know to live.
