

A theory of multiple literacies

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Even more than multiple intelligences which we share with other language-using creatures, multiple *literacies* make us humans different. We are the only creatures who use systems of marks to express meaning. These strings of marks, these literacies include drawing, writing, musical notation, and mathematical notation. Marks are brain food. Oxygen, glucose, and symbol "crunching" nourish human brains.

Our brains are electrical systems: they oscillate. There is an ebb and flow of neural activity like tides in our brains. There is interhemisphericity. Information from the right hemisphere (and other right-brain systems) travels to the left hemisphere (and other left-brain systems). The bihemispheric brain is cooperative.

Our minds are designed to work in a cross-modal manner, shunting information back and forth from one mode of representation, or literacy, to another. Each shunting, each exchange is transformational. A picture translated into words or words translated into a picture creates new meaning. When we describe a system in which the output is different from the input and also greater than the input, we describe that system as non-linear. The weather, celestial orbits, population growth are non-linear. Dynamic, living growing systems including our brains are non-linear.

As very young children, we embark on the adventure of literacy through scribbling and drawing. No one teaches us how. Mark-making is our language instinct. Initial scratchings, tentative lines and dots, spirals and circles help us organize our brains for our evolutionary birthright: marks of significance.

Human literacies are multiple and varied, interdependent and equivalent, related and necessary. No single system for representing thought is powerful enough to explain all of our thoughts. Godel's Incompleteness theorem applies to mind. Emotion and information require a range of marks. We need to be able to draw and write and compute and sing our ideas. A scientific explanation is that: scientific. The same is true with artistic, mathematical and musical explanations. Each system provides a way to look at things. But put several of these systems together, and we start to get somewhere!

Literacies nourish each other. One literacy helps another to grow. Literacies contain each other and require each other. Literacies are embedded in each other. Long before children can write or read they are getting ready by exploring, scribbling, talking, drawing, listening, and looking, and wondering.

If we celebrate little children's mark-making as the truly astonishing starting point in our human journey as language-users, and if we let children explore a range of mark-making systems, literacies will flow from each other. We will welcome the multiliterate child.

In *Consilience*, E.O. Wilson makes an argument for the coming together not only of the sciences but of the arts and humanities. One way this "leaping together" of the arts and humanities and the sci-

ences can be achieved is by placing mark-making at the heart of the human mental endeavor, placing equal value on the mark-making systems. Scribbles are pluripotential. They can become many things. Scribbles are seminal and significant. A drawing is no less important than a piece of writing. An algebraic equation is no less meaningful than a song to the mind that has been made comfortable with these marks.

Why constrain the human brain to a limited range of literacies? It does not take a musician to teach musical notation nor a mathematician to teach mathematical notation nor an artist to teach drawing nor a writer to teach the marks we call writing.

A point about reading.

If little children can talk about their drawings, they are reading. If marks are intelligible to the child, then reading adheres to the very mark-making process. If children read their own marks first, and another's second, they are more likely to become lifelong readers and writers.

If we start with scribbles, honoring little children's mark-making, we lay the foundations for a comprehensive educational program where learning is possible for every child, and pleasing to every child, and meaningful for every child in connection with literacy, our special human endeavor.