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A Thousand Rivers: What the Modern World has Forgotten about Children and Learning



By Carol Black (/author/carol-black/) / schoolingtheworld.org (<http://schoolingtheworld.org/a-thousand-rivers/>)

Aug 12, 2014

The following statement somehow showed up on my Twitter feed the other day:

“Spontaneous reading happens for a few kids. The vast majority need (and all can benefit from) explicit instruction in phonics.”

This 127-character edict issued, as it turned out, from a young woman who is the “author of the forthcoming book *Brilliant: The Science of How We Get Smarter*” and a “journalist, consultant and speaker who helps people understand how we learn and how we can do it better.”

It got under my skin, and not just because I personally had proven in the first grade that it is possible to be bad at phonics even if you already know how to read. It was her **tone**; that tone of sublime assurance on the point, which, further tweets revealed, is derived from “research” and “data” which demonstrate it to be true.

Many such “scientific” pronouncements have emanated from the educational establishment over the last hundred years or so. The fact that the proven truths of each generation are discovered by the next to be harmful folly never discourages the current crop of experts who are keen to impose their freshly-minted certainties on children. Their tone of cool authority carries a clear message to the rest of us: **“We know how children learn. You don’t.”**

So they explain (http://schoolingtheworld.org/a-thousand-rivers/#tooltip_load_1) it to us.

The “scientific consensus” about phonics, generated by a panel convened by the Bush administration and used to justify billions (<http://www.washingtonpost.com/wp-dyn/content/article/2006/09/29/AR2006092901333.html>) of dollars in government contracts awarded to Bush supporters in the textbook and testing industries, has been widely accepted as fact through the years of “No Child Left Behind” and “Race to the Top,” so if history is any guide, its days are numbered. Any day now there will be new research (<http://www.telegraph.co.uk/education/educationnews/9289480/Starting-school-at-seven-can-boost-pupils-reading-skills.html>) which

proves that direct phonics instruction to very young children is harmful, that it bewilders and dismays them and makes them hate reading (we all know that's often true, so science may well discover it) — and millions of new textbooks, tests, and teacher guides will have to be purchased at taxpayer expense from the Bushes' old friends at McGraw-Hill.

The problems with this process are many, but the one that I'd like to highlight is this: the available "data" that drives it is not, as a matter of fact, the "science of how people learn." It is the "science of what happens to people in schools."

This is when it occurred to me: people today do not even know what children are actually *like*. They only know what children are like **in schools**.

Schools as we know them have existed for a very short time historically: they are in themselves a vast social experiment. A lot of data are in at this point. One in four Americans does not know (<http://www.npr.org/blogs/thetwo-way/2014/02/14/277058739/1-in-4-americans-think-the-sun-goes-around-the-earth-survey-says>) the earth revolves around the sun. Half of Americans don't know (<http://www.npr.org/blogs/thetwo-way/2014/02/14/277058739/1-in-4-americans-think-the-sun-goes-around-the-earth-survey-says>) that antibiotics can't cure a virus. 45% of American high school graduates don't know (<http://www.knightfoundation.org/blogs/knightblog/2012/11/8/first-amendment-education-surveys-keep-challenging-us-try-new-things>) that the First Amendment of the Constitution guarantees freedom of the press. These aren't things that are difficult to know. If the hypothesis is that universal compulsory schooling is the best way to to create an informed and critically literate citizenry, then anyone looking at the data with a clear eye would have to concede that the results are, at best, mixed. At worst, they are catastrophic: a few strains of superbacteria may be about to prove that point for us.

How did you learn to use a computer? Did a friend help you? Did you read the manual? Did you just sit down and start playing around with it? Did you do a little bit of all of those things? Do you even remember? You just learned it, right?

On the other hand, virtually all (http://books.google.com/books/about/SOMEONE_HAS_TO_FAIL.html?id=_vXWKjJAImYC) white American settlers in the northeastern colonies at the time of the American Revolution could read, not because they had all been to school, and certainly not because they had all been tutored in phonics, which didn't exist (http://schoolingtheworld.org/a-thousand-rivers/#tooltip_load_2) at the time. Thomas Paine's *Common Sense* (http://en.wikipedia.org/wiki/Common_Sense_%28pamphlet%29), not exactly light reading, sold over 500,000 copies in its first year of publication, the equivalent of a book selling sixty million copies today. People learned to read in a variety of ways, some from small one-room schools, but many from their mothers, from tutors, traveling ministers, apprentice's masters, relatives, neighbors, friends. They could read because, in a literate population, it is really not that difficult to transmit literacy from one person to the next. When people really want a skill, it goes viral. You couldn't stop it if you tried.

In other words, they could read for all the same reasons that we can now use computers. We don't know how to use computers because we learned it in school, but because we wanted to learn it and we were free to learn it in whatever way worked best for us. It is the saddest of ironies that many people now see the fluidity and effectiveness of this process as a characteristic of computers, rather than what it is, which is a characteristic of human beings.

In the modern world, unless you learn to read by age 4, you are no longer free to learn in this way. Now your learning process will be scientifically planned, controlled, monitored and measured by highly trained "experts" operating according to the best available "data." If your learning style doesn't fit this year's theory, you will be humiliated, remediated, scrutinized, stigmatized, tested, and ultimately diagnosed and labelled as having a mild defect in your brain.

How did you learn to use a computer? Did a friend help you? Did you read the manual? Did you just sit down and start playing around with it? Did you do a little bit of all of those things? Do you even remember? You just learned it, right?

Wolves have litters of same-age puppies which the mother leaves in the care of another adult while she hunts; elk give birth to calves which are able to stand up and follow the herd within a matter of minutes. Primates, including human beings, have one offspring at a time which the mother carries with her while she seeks food or works, often sharing care with rich networks of relatives and friends.

All social mammals have evolved species-specific social structures and behaviors for learning and transmitting the skills they will need to survive as adults. Our own species evolved over hundreds of thousands of years to live in small mixed-age communities where children are embedded in adult activities, surrounded by older and younger children and grandparents, immersed in the natural world, free to move and play and exercise their bodies, and where they are able to observe, imitate and then participate in adult work as they become developmentally ready. In societies that still live according to this model, elegant indigenous pedagogies have developed over millennia that are so attuned to the natural development of children that complex and nuanced skills can be acquired in ways that appear almost effortless.

Any Gikuyu (http://schoolingtheworld.org/a-thousand-rivers/#tooltip_load_3) mother in Kenya knows that you wait to give a child a task until you see that she is ready for it. Any Baiga (<http://schoolingtheworld.org/resources/essays/indigenising-curriculum/>) father in the forests of India knows that if a child tries something and then backs away, you leave him alone, because he will be back to try again later. A Yup'ik (<http://schoolingtheworld.org/resources/essays/indigenous-knowledge-systems/>) elder knows that young children learn better from story than lecture, from hands-on experience than direct instruction. Any Fore (https://openlibrary.org/works/OL2408416W/The_edge_of_the_forest) parent from Papua New Guinea knows that children sometimes learn best by emulating older children, not by being taught by adults.

People all over the world know these things about children and learning, and interestingly, they are as workable for learning how to design software or conduct a scientific experiment or write an elegant essay as they are for learning to hunt caribou or identify medicinal plants in rainforest.

But we don't know them any more.

Any wildlife biologist knows that an animal in a zoo will not develop normally if the environment is incompatible with the evolved social needs of its species. But we no longer know this about ourselves. We have radically altered our own evolved species behavior by segregating children artificially in same-age peer groups instead of mixed-age communities, by compelling them to be indoors and sedentary for most of the day, by asking them to learn from text-based artificial materials instead of contextualized real-world activities, by dictating arbitrary timetables for learning rather than following the unfolding of a child's developmental readiness. Common sense should tell us that all of this will have complex and unpredictable results. In fact, it does. While some children seem able to function in this completely artificial environment, really significant numbers of them cannot. Around the world, every day, millions and millions and millions of normal bright healthy children are labelled as failures in ways that damage them for life. And increasingly, those who cannot adapt to the artificial environment of school are diagnosed as brain-disordered and drugged.

It is in this context that we set out to research how human beings learn. But collecting data on human learning based on children's behavior in school is like collecting data on killer whales based on their behavior at Sea World.

In 2010 a trio of researchers from the University of British Columbia published a paper (<http://hci.ucsd.edu/102b/readings/WeirdestPeople.pdf>) that reverberated through the social sciences. Joseph Henrich, Steven J. Heine, and Ara Norenzayan, the authors of the paper, challenged the way the social sciences had for a century made broad generalizations about human nature and behavior based on research on a narrow cultural subset of humanity — what they called the “Western, Educated, Industrialized, Rich, Democratic” — or “WEIRD” — societies. After reviewing a comparative database from across the behavioral sciences, Henrich *et al.* found that these societies not only were not representative of humanity as a whole, they were by many measures at one extreme of the bell curve of human variation; in other words, **“members of WEIRD societies, including young children, are among the least representative populations one could find for generalizing about humans.”** By many measures Americans were further out on the bell curve than Europeans; in other words, they were “outliers among outliers.”

Many of these outlying traits pertain to the type of education that we think of as “normal” in the United States. It turns out that Americans are at the far end of the spectrum in their preference for competition over cooperation; for self-promotion over humility; for analytical over holistic thinking; for individual rather than collective success; for direct rather than indirect communication; for hierarchical rather than egalitarian conceptions of status. So in school we urge our children to strive to be better than their friends and we praise them publicly if they succeed, where many other societies would consider this to be extremely bad manners (http://schoolingtheworld.org/a-thousand-rivers/#tooltip_load_4). We focus on our children directly and tell them exactly what we want them to know, where in many other societies adults expect children to observe their elders closely and follow their example voluntarily. We control and direct and measure our children learning in excruciating detail, where many other societies assume children will learn at their own pace and don't feel it necessary or appropriate to control their everyday activities and choices. In other words, what we take for granted as a “normal” learning environment is not at all normal to millions of people around the world.



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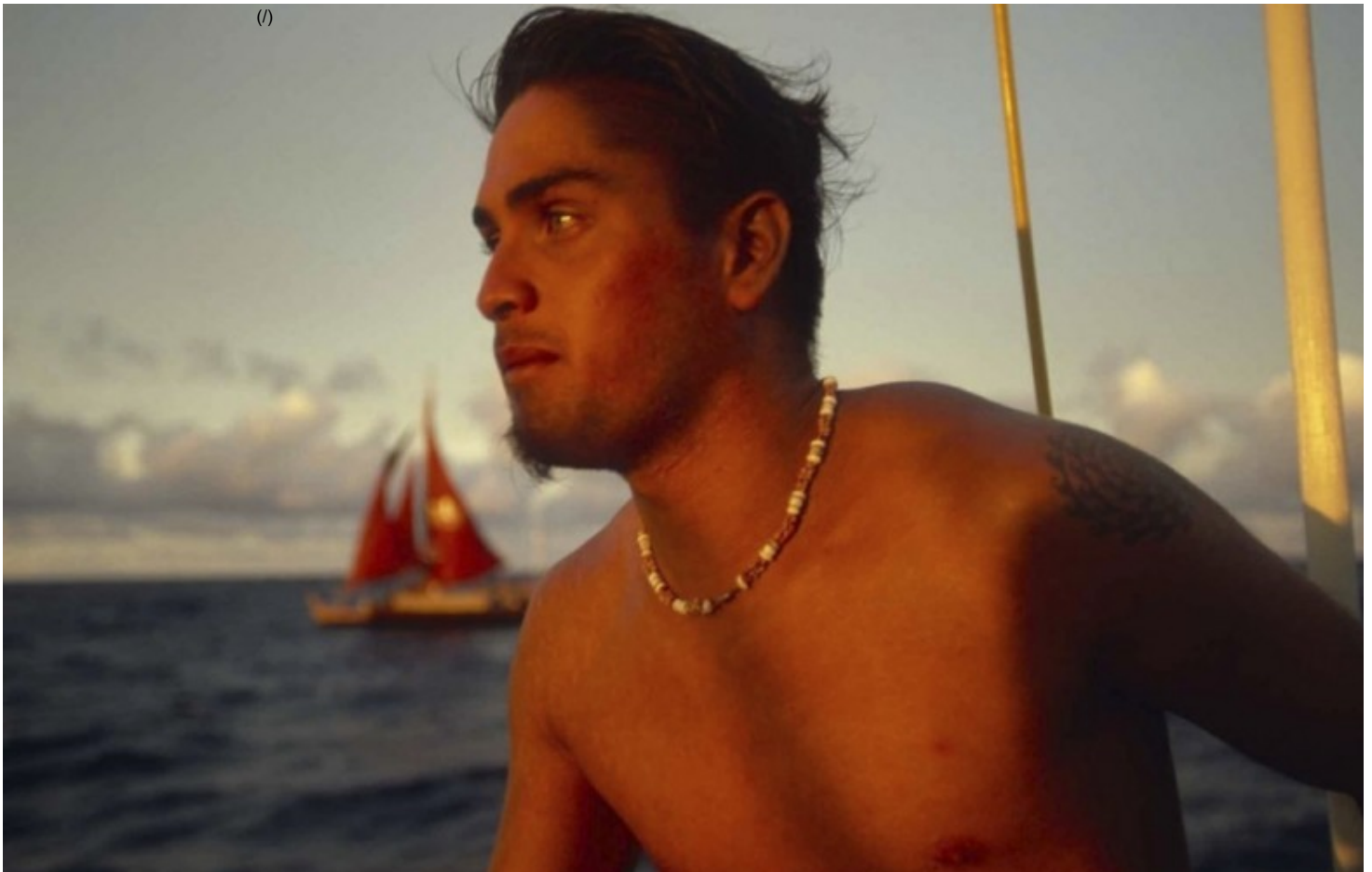
If Americans are outliers among outliers, then the subculture of American institutional schooling, which makes increasingly rigid demands on very young children and suppresses more and more of their natural energies and inclinations, is an outlier to that. Traits that would be valued in the larger American society — energy, creativity, independence — will get you into trouble in the classroom, and sadly, it turns out that some of our children just can't follow us that far out on the bell curve. The human species is extremely malleable and variable, but not infinitely so, and what you see in individual children as our culture grows more and more extreme is that the underlying species nature re-emerges, sometimes disruptively. Like people who try to keep wolves as pets, we find that some of our children start to chew through the leashes.

One day I watched a nine-year-old boy as he led a group of children scrambling over Vasquez Rocks, a great sandstone formation that slants up out of the California desert. He was one of those magnetic, electrical, radiant boys; kind to the younger ones, strong, quick, inquisitive, sharp as a tack, his eyes throwing sparks in the clear air. It was a joy just to watch him, I said to the friend standing beside me. She told me he had just been diagnosed with ADHD.

When you see children who do not learn well in school, they will often display characteristics that would be valued and admired if they live in any number of traditional societies around the world. They are physically energetic; they are independent; they are sociable; they are funny. They like to do things with their hands. They crave real play, play that is exuberant, that tests their strength and skill and daring and endurance; they crave real work, work that is important, that is concrete, that makes a valued contribution. They dislike abstraction; they dislike being sedentary; they dislike authoritarian control. They like to focus on the things that interest them, that spark their curiosity, that drive them to tinker and explore.

“Experts” in our WEIRD society tell us these children are learning disabled; they have poor impulse control; they lack organizational skills they are oppositional. One in twenty, one in ten, one in seven of our precious bright-eyed children, we are told, have some kind of organic brain defect that disables them as learners.

But any Maori (<http://www.youtube.com/watch?v=9wPgk62a9b4>) parent knows that you have to watch a child patiently, quietly, without interference, to learn whether he has the nature of the warrior or the priest. Our children come to us as seeking beings, Maori teachers tell with two rivers running through them — the celestial and the physical, the knowing and the not-yet-knowing. Their struggle is to integrate the two. Our role as adults is to support this process, not to shape it. It is not ours to control.



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(<http://schoolingtheworld.org/wp-content/uploads/2014/08/WadeDavis31-e1407171267900.jpg>)

photo by Wade Davis

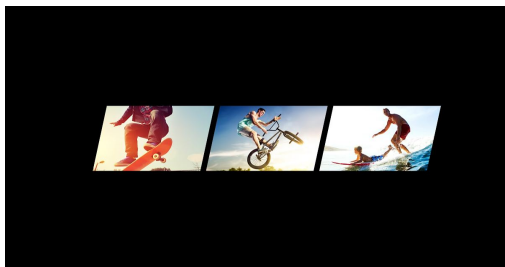
“The rainbows kind of wilt like flowers.” That’s what my daughter said as she stood at the top of a mountain one rainy, sunny day, watching the colors arcing and dissolving in the air. She was two and a half.

So I always knew this child had a gift for words. She loved to be read to, she made up stories and songs and poems and plays; she invented her own mythologies; she composed endless letters to her beloved granny.

But she did not read early.

She did not go to school, so this did not pose a problem for her or for anyone else. She was part of a group of kids whose sense of politeness dictated that they not make a big issue about reading or any other skill that one kid had and another kid lacked. If they were playing a game and needed to read something, or making up a play and wanted to write something, they would just find a kid or an adult who could do it.

A few times I tried, while reading her a story, to run my finger under the words as I read them, or to point out the sounds that certain letters make. Like most kids who don’t go to school, she was quick to recognize an adult with an agenda. “I don’t like it when you do that thing with your finger,” she said. So I stopped.



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I began to notice that it was as though she was actually averse to focusing on the print on the page. She memorized whole books, whole poems, but she did it by sound, not sight. She played the piano but she didn’t like to look at the notes. When she drew, which she did constantly, she didn’t draw by looking at things and then copying what she saw. She drew from somewhere deep inside, her lines fluid, deft

intuitive. (l)

Finally one day when she was about seven and a half years old, her beloved granny, my dear mother-in-law, who happened to be a school psychologist in the public school system, couldn't take it any longer. Although she had tried not to interfere, she could no longer contain the scientific certainty of her advanced degrees and her forty years of professional experience and her steady access to the best available data; in real anguish she burst out: ***"I just know that there is a certain cognitive window for a child to learn to read and if you miss that window you are going to have problems later on! And for Isabel that window occurred when she was about four years old!"***

There was a long moment of silence.

"Granny," I said, finally. "If you go to school and you can't read when you're seven you are going to be stigmatized and humiliated and mad incredibly anxious in a way that is going to interfere with your ability to learn in the future. That's not going to happen to Isabel."

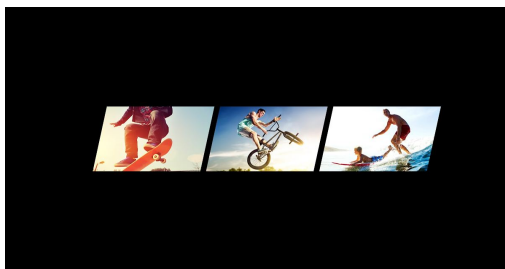
Surprisingly, there was another moment of silence. She hadn't thought of that before.

"Plus," I continued, "Children's stories are full of mean step-mothers and witches and man-eating dragons. I learned to read when I was four because I **loved** all those things. Isabel is **terrified** of them. When we're reading *The Mouse and the Motorcycle* and the lady walks into the room with the vacuum cleaner, she wants us to read ahead and tell her if the little mouse gets away. She has no desire to be left alone with those stories. She wants a grown-up to read them to her."

To my surprise, Granny's face melted at this. It sort of wilted like a flower, in fact. Her voice got very soft.

"Oh," she said. "I was like that when I was little."

Six months later Isabel was reading *Harry Potter* independently. She no longer wanted to wait for an adult to have time to read to her; she needed to know what happened next, dragons or no dragons. When she was fourteen she read *War and Peace*. When she was twenty she was the head writing tutor at her college.



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How did this happen? We don't really know. This is an important point. You don't know. I don't know. Nobody really knows. The cognitive processes which underlie literacy are complex beyond your wildest imagination; our scientific understanding of them is in its early infancy. But people whose kids don't go to school are nodding their heads in recognition at my story, because among kids who don't go to school, or who go to democratic or free schools, Isabel's pattern of learning to read is common. (<http://www.psychologytoday.com/blog/freedom-learn/201002/children-teach-themselves-read>) It happens all the time. The fact that most literacy "researchers" and "experts," not to mention school psychologists, don't even realize that it is possible is something that should concern us all.

"We are embarrassing ourselves in the eyes of future generations with our claims that we can identify reading skills and disabilities with blurry patches of color on a functional MRI image. The science is just not there yet. Not even close."

What should concern us even more is that these "experts" are claiming to know more about the cognitive processes of reading than they actually do, and policy that impacts millions of children -- that limits their horizons, that brands them as disabled, that drives them to frustration and despair -- is being based on their overweening claims. Philip Lieberman, a cognitive scientist who studies the evolutionary basis of the neural networks involved in language, refers to the current views which identify "brain centers" for language as a kind of "neophrenology" ([https://muse.jhu.edu/login?](https://muse.jhu.edu/login?auth=0&type=summary&url=/journals/perspectives_in_biology_and_medicine/v044/44.lieberman.html)

[auth=0&type=summary&url=/journals/perspectives_in_biology_and_medicine/v044/44.lieberman.html](https://muse.jhu.edu/login?auth=0&type=summary&url=/journals/perspectives_in_biology_and_medicine/v044/44.lieberman.html)) -- an updated version of the 19th-century theory that you can identify types of intelligence by charting the lumps on a person's skull. In other words, we are embarrassing ourselves in the eyes of future generations with our claims that we can identify reading skills and disabilities with blurry patches of color on a functional MRI image. The science is just not there yet. Not even close.

But any Maori mother knows that children do not learn in a straight upward line but in a stair-step pattern. They leap forward, then plateau for a while, then leap forward again. Their learning is an underground river, you can't see it, can't even feel it at times. Then suddenly they soar. You can't control it; you can't take credit for it. It's theirs. You have to be there, providing warmth and stability, providing tools and resources, answering questions, telling stories, having meaningful adult conversations and doing meaningful adult work in their presence. But when they soar, it's on their own wings.

Mereana on learning



Maori educator Mereana Taki

Any Cree parent knows that you can tell when a child is ready for something because he will begin to ask questions about it. You can't control the timing of this, and there is no reason to. We don't know when the salmon and the geese will arrive every year, when the ice will melt and the rivers rise, when the huckleberries will bloom and set fruit, but they bloom and set fruit every year, and our children grow up.

Even in WEIRD societies, everybody knows that there is a normal range of several months during which a child will say her first words or take her first steps. A child who walks at 10 months will not necessarily be more physically talented than a child who walks at 14 months, and pediatricians spend much of their day reassuring us of this and encouraging us not to compare our children to each other. There is no basic scientific or otherwise, for assuming children will reach any major milestone at a uniform age, and those of us whose kids don't go to school often joke about the fact that if we were to require all children to take their first steps at the same age, we would be a nation of people with walking disorders.

But as a child moves through the life cycle, from first steps and first words to toilet training to losing baby teeth to riding a bicycle to reaching puberty, the normal range of variation does not decrease – it **increases. Dramatically.** A completely normal healthy girl may reach puberty at nine or at fifteen, a normal range of several years. Reading compounds this variability with the enormous complexity of the cognitive, visual, auditory, emotional, physical, and social dimensions which must all be mature and working together in the growing child for fluent literacy to emerge. And yet we have created a multi-billion-dollar compulsory institution with its ancillary multi-billion dollar industries that all rest on the idea that children should reach this milestone at the same age.

And that if they can't, there will be hell to pay.

One day when my daughter was eight we had the feeling that she and her best friend Raphael were up to something, and we found them huddled together with a book, trying to figure out what it said. Like the kids in Sugata Mitra's famous "Hole in the Wall" (<http://www.youtube.com/watch?v=dk6OsYrU2RU>) experiments, they were figuring it out together. When I entered the room they looked

up like kids who were caught doing something illicit. This is another thing you learn about kids when they don't go to school. They don't want to be watched all the time. They don't want to be scrutinized and measured. They often don't even want to be praised or encouraged. They have a remarkable sense of dignity and autonomy, and they defend it fiercely. They want their learning to be their own.

In pretty short order all the kids in their little group could read fluently. They learned from cereal boxes and street signs and Sesame Street from computers and books and big sisters, from stories and songs and and plays and poems, from board games and video games and word games, from recipes and labels and assembly instructions, from letters to grannies, from their parents, from each other. Very few people are going to make it through childhood (http://schoolingtheworld.org/a-thousand-rivers/#tooltip_load_5) in America without somebody mentioning at some point that the letter "B" makes the "buh" sound (except when it doesn't), so if you consider that phonics instruction, that's fine. The idea that there is a relationship between letters and sounds is ubiquitous in the culture, and kids are going to encounter the proposition somewhere along the way that M is for Monkey and S is for Snake. Some of the kids asked adults for help in learning to read; some didn't. Some of the kids used phonics workbooks or computer programs, or they picked up workbooks for a while and then got bored and set them aside. Many never bothered.

The point is that they learned to read the way we all learned to use computers; flexibly, idiosyncratically, each in whatever way and at whatever time and pace worked best for him. A phonics program is simply a tool to use or not, as you are so inclined, like a computer manual; some people may use it systematically, some sporadically, some never.

When kids are allowed to begin reading when they are interested and ready, numerous anecdotal reports indicate something like a flattened bell curve distribution that runs from about age four or five to age ten or eleven, with the peak of the bell spread out widely through the 5-6-7-8-9 range (although psychologist Peter Gray reports (<http://www.psychologytoday.com/blog/freedom-learn/201002/children-teach-themselves-read>) that the cultural practice of texting may be shifting the average earlier.) The children who begin reading later usually learn rapidly, going from "behind" their putative "grade level" to "ahead" of it within the space of a few months. Virtually all are reading at or above "grade level" by their teen years.

Why do some children read later than others? Again, we don't know. But many late readers have high levels of interest and ability in the mechanical, musical, spatial, mathematical, or digital realms. Many are gifted in the performing arts or athletics. Some simply have a different learning strategy; one that absorbs, considers, consolidates, integrates, and then suddenly blossoms fully formed. As Isabel said when she was nine or ten, ***"I like to wait until I already know a thing, and then I like to learn it."***

But crucially, observers note that ***the age of onset of reading is not predictive of ultimate intellectual aptitude or achievement***; it is not uncommon for late readers to have high levels of intellectual ability and even literary interest and talent. Like Einstein who did not speak until age three, some children simply develop their skills in a different order.

In other words, ***it's just not a big deal.***

Unless you make it a big deal. If you push a child to read when he is not ready, you can do a lot of damage very fast. When adults become anxious about a child's development, that anxiety is transmitted instantaneously; another thing you discover when your kids don't go to school is that you can't fool a six-year-old. They see right through you. So what adults may like to call "encouragement" or "support," kids often see as "manipulation" or "pressure," and they resist it. Pay attention to the actual child in front of you as she responds to that "fun" educational activity you planned, and you will quickly learn to see when this is happening.

Children's resistance takes many forms; inattention, irritability, disruption, withdrawal, restlessness, forgetting; in fact, all of the "symptoms" of ADHD are the behaviors of a child who is actively or passively resisting adult control. Once you start to generate this resistance to learning, if you don't back away quickly, it can solidify into something very disabling.

If you press a child hard to do something when she is really developmentally unable to do it — I made that mistake more than once, and our schools make it every day — the psychological shutdown that occurs is catastrophic. Simply catastrophic. Let me repeat this: when you push a child to do something she simply developmentally can not do, you create a profound belief that (a) ***I hate this***; (b) ***I can't do this***; (c) ***will never be able to do this***, and (d) ***There's something wrong with me.***

All, I should point out, profoundly disabling beliefs.

Interestingly, the Finnish school system, which has some of the highest reading scores in the world, does not begin direct instruction in reading until age seven, closer to the peak of a natural unforced bell curve than the American system, which keeps pushing instruction ever earlier. A study

(http://www.researchgate.net/publication/229433053_Children_learning_to_read_later_catch_up_to_children_reading_earlier) in New Zealand compared Waldorf schools, which begin reading instruction at age seven, to public schools, which begin at age five, and found no

long-term benefit to earlier instruction. In fact, many of the studies which show an advantage to early reading instruction compare children's proficiency at around age eight or nine. What they don't show is that by age ten or eleven, the advantage disappears, and that by twelve or thirteen, it reverses, with children taught later showing greater comprehension and enjoyment of reading than those taught earlier.

So one hypothesis is that American schools are not only assuming the normal developmental window for reading to be **too narrow**, they're also placing it **too early**. In other words, it's not like expecting all children to take their first steps at the **average** age of twelve months: it's like expecting them all to take their first steps at the **precocious** age of ten months. In doing this you create a sub-class of children so bewildered, so anxious, whose natural processes of physical and neurological development and organization are so severely disrupted, that you **literally have no way of knowing what they would have been like if you had not done this to them**.

"Grade level standards," please recall, do not exist in nature; they are not created scientifically, but by fiat. And there has been almost no serious study of cognitive development in children whose learning has not been shaped by the arbitrary age grading of the school system. Finland simply sets its standards at a place where most children will succeed. The U.S. sets them at a place where a really significant percentage will fail. This is a choice. In making it, we may be creating disabilities in kids who would have been fine if allowed to learn to read on their own developmental schedule.

Because guess what? If there is one thing that the data proves, it's that our children are all different.

The letter "D," by the way, makes the "duh" sound.

It is not up to our children to accept a disability label in order to "qualify" for an appropriate learning environment; it is up to adults to provide learning environments which are flexible enough to accommodate the natural variations in our children.

A common saying among Aboriginal (<http://ro.uow.edu.au/cgi/viewcontent.cgi?article=1931&context=edupapers>) people in Australia is, "All our children are clever." Even the author of *Brilliant: The Science of How We Get Smarter*, reports that, lo and behold, research is beginning to show that dyslexics are smarter in some ways than early readers. Did we really have to wait for science to discover this? Could we really not just look in our children's bright eyes and know that they all bring something unique and precious to the world? Did we have to line them up and compare them and find a predictable percentage of them to be deficient and even "disabled?"

The "neurodiversity" (http://www.pbs.org/pov/neurotypical/photo_gallery_background.php?photo=2#.U-BvqVbT7wI) movement has begun to challenge the educational hegemony which defines whose cognitive styles are "normal" and whose are a "disorder." Blurry variations on an fMRI image notwithstanding, there is no persuasive scientific evidence that the vast majority of the 15-17% of the population estimated to be dyslexic are not perfectly healthy, normal people who simply have different talents and learn in different ways and on different timetables, and many dyslexics are beginning to push back against the disability model, asserting that they are no more "disabled" by their particular way of learning than a concert violinist is disabled by not being a good hockey player. Dyslexic children often have better imaginations than non-dyslexics, after all, but nobody labels the "normal" children as having an "imagination disability."

It is not up to our children to accept a disability label in order to "qualify" for an appropriate learning environment; it is up to adults to provide learning environments which are flexible enough to accommodate the natural variations in our children. We can accommodate children who read later and/or more slowly not as a special service for the disabled, but simply as a normal everyday matter of courtesy and respect for our fellow humans, who have a wide variety of strengths and weaknesses as we all do.

Dyslexia isn't something that you **have**, says Dr. Ross Cooper, a dyslexia researcher who is dyslexic himself (he embraces the term the way gay folks have embraced the word "queer.") It's something that you **are**. And it's something, he emphasizes, that has value as part of the spectrum of human diversity. Cooper hypothesizes (<http://www.brainhe.com/#Holist>) that the common feature of many "specific learning disabilities" is a preference for processing information visually and holistically rather than verbally and analytically. Rather than narrowly focusing on things in a linear sequential way, the child with this tendency absorbs visual input and meaning and context in a "big picture" way (blurry colors lighting up in the right hemisphere of the brain), a process which may slow down decoding but which also deepens and enriches it, leading to lateral thinking, intuition, imagination and creativity. These children's brains are organizing themselves differently, and it should go without saying that their developmental arc may therefore be different. When we interfere in the process of this organization, when we stigmatize it and test it and remediate it prematurely -- when we try to teach dyslexics to think like other children by aggressively drilling them in phonics -- Cooper says we are robbing these children of the opportunity to build organically on their many strengths rather than being treated as something broken that needs fixing.

Interestingly, children from traditional indigenous cultures often process information holistically and contextually rather than analytically well. If you ask (<http://www.wbez.org/blogs/clever-apes/2012-04/clever-apes-29-nature-and-human-nature-97867>) people from urban non-native cultures to divide a list of plants and animals into groups, they will tend to do it taxonomically, separating them into the categories of mammals, birds, fish, plants. If you ask a Native person, they may do it ecologically, with a turtle, willow, heron, and beaver all in the same group because they all live in a wetland. The test may register this as a “wrong” answer, because schools tend to emphasize taxonomic, analytic thinking. But the second answer reflects a form of holistic systems thinking that rural Native children may be fluent in at a younger age than their urban, non-native peers.

City kids who grow up among cartoon mice who talk and fish who sing show tunes are so delayed in their grasp of real living systems that Henrich *et al.* suggest that studying the cognitive development of biological reasoning in urban children may be “the equivalent of studying “normal” physical growth in malnourished children.” But in schools, rural Native children are tested and all too often found to be less intelligent and more learning “disabled” than urban white children, a deeply disturbing phenomenon which turns up among traditional rural people all over the world.

Why is this? As intelligence researcher James Flynn has discovered (<http://acdlonline.com/zoomdocs/presentations/Searching%20for%20Justice%20Discovery%20of%20IQ%20gains%20over%20time%20Flynn.pdf>), if you calculate average U.S. IQ scores from a hundred years ago against today’s renormed tests, you find that by a modern definition the grandparents and great-grandparents of most white Americans would be categorized as *mentally disabled*. Does this mean your ancestors were morons? Yeah, maybe. But what it probably means is that in the 19th and early 20th centuries, most European-Americans, like many indigenous people today, lived in a world where real concrete contextualized knowledge and intelligence, not abstracted school-based knowledge, was necessary for survival. Malcolm Gladwell reports (<http://www.newyorker.com/magazine/2007/12/17/none-of-the-above>) in *The New Yorker* that when psychologist Michael Cole gave members of the Kpelle tribe of Liberia a version of the WISC similarities test, they found that the Kpelle would consistently sort a knife and potato into the same category “because a knife is used to cut a potato:”

“A wise man could only do such-and-such,” they explained. Finally, the researchers asked, “How would a fool do it?” The tribesmen immediately re-sorted the items into the “right” categories.

So the IQ test, like other school-based tests, turns out to be not so much a measure of intelligence as a measure of *modernization* — of a large-scale cultural shift in industrialized societies from concrete to abstract thinking, from holistic to analytic thinking, from contextualized systems thinking to de-contextualized linear thinking.

In other words, your IQ is not a measure of how smart you are. It’s a measure of how WEIRD you are.

Fine, you might say; but isn’t that an inevitable and positive stage in human “development” as societies become more technologically complex and intellectually “advanced?” Not according to Iain McGilchrist, a psychiatrist and neuroimaging researcher whose groundbreaking book *The Master and his Emissary* (<http://www.amazon.com/The-Master-His-Emissary-Divided/dp/0300188374>) argues that the narrowly focused, mechanical, analytic part of the brain so dominant in modern societies actually evolved as a limited tool to be guided and restrained by the more broadly focused, holistic, relationship-based part of the brain. Modern western civilization, McGilchrist maintains, is not more “advanced” than other human societies, but rather has become dangerously unbalanced in the direction of a kind of cold, abstracted, mechanical analysis at the expense of a more interconnected, compassionate, holistic understanding of the world. That kind of imbalance, as McGilchrist points out, does not make you more “brilliant” than other people; it makes you a sociopath.

Human cognitive diversity *exists for a reason*; our differences are the genius – and the conscience – of our species. It’s no accident that indigenous holistic thinkers are the ones who have been consistently reminding us of our appropriate place in the ecological systems of life our narrowly-focused technocratic society veers wildly between conservation and wholesale devastation of the planet. It’s no accident that dyslexic holistic thinkers are often our artists, our inventors, our dreamers, our rebels.

Marie Battiste, a Mi’kmaw education professor at the University of Saskatchewan, has a very clear term for the tendency of one powerful group to claim the authority to define its own cognitive traits and preferences as normal and desirable and all other ways of thinking, learning, and understanding the world as deficits and disabilities: she calls it “cognitive imperialism.” (<http://www.win-hec.org/docs/pdfs/Journal/Marie%20Battiste%20copy.pdf>) It’s the cognitive equivalent of racism. It leads naturally, of course, to a kind of cognitive Manifest Destiny that assumes that one way of thinking, of learning, of being in the world is destined to overwhelm and replace others (http://schoolingtheworld.org/a-thousand-rivers/#tooltip_load_6).

Which brings us back to phonics. George Bush's "Reading Czar," Reid Lyon, drew a lot of media attention with the boast that his approach reading instruction was "based on science, not philosophy." (There's that **tone** again.) But there is nothing "scientific" about the effort to decide on the One Best Evidence-Based Method for teaching reading to all children. As Henrich *et al.* point out, WEIRD research comes to WEIRD conclusions because it is being conducted by WEIRD researchers who ask WEIRD questions. In this case the question they asked was, "***If we are going to force every child in the United States to learn to read in one way, what should that way be?***"

But there is no scientific reason to make that the question. It is a philosophical — and a profoundly political — choice.

Any Yanomami father knows that you don't have to force young children to learn, you just give them the tools they need and then let them play. Any Cree grandmother knows that if you see a child doing something incorrectly, you don't shame her by overtly pointing it out, you just quietly, without fanfare, demonstrate the right way to do it. Any Odawa elder knows that a child will sometimes learn more from your silence than from your speech.

Slowly, falteringly, painstakingly, science is rediscovering some of this.

Since the Enlightenment, every generation of scientists has tended to fall into the fallacy that **now** we stand at the apex of human knowledge and understanding, that error has fallen away at our feet, and that now we "know" how things really are. Depending on the domain being studied, this intellectual hubris can yield results which are comical, awkward, destructive, or, when it comes to children, tragic. In the 1950s scientists "knew" that baby formula was better for children than human milk, an absurdity which has been responsible for the deaths by diarrheal disease and malnutrition of millions of infants in the developing world. They "knew" that newborns, like animals, did not have sufficiently developed neural systems to feel pain, so they performed surgery on millions of infants (and animals) without anesthesia. They "knew" that people learn as a consequence of positive or negative reinforcements for behavior rather than as a result of internal passions, drives, and preferences — let alone as a result of a celestial river running through them — so they persuaded an entire education system to train children like pigeons and rats, with incessant scrutiny and "feedback," punishments and rewards.

Right now American phonics advocates are claiming that they "know" how children learn to read and how best to teach them. They know nothing of the kind. A key value in serious scientific inquiry is also a key value in every indigenous culture around the world: **humility**. We are learning.

But every Inuit parent knows you tell stories in the evening, when the child's mind is relaxed and expansive, and before sleep which carries words and images deep into the soul. Science is rediscovering that memories are consolidated at night, despite the previous generation's "data" which "proved" that children learn best in the morning. Children often listen better at night, they ask deeper questions at night, they imagine more vividly at night. In the brightness of day the mind turns outward to the world, a child often wants to be moving and active and socially interacting, and the things you are told in the morning may ping off all this buzzing activity like a moth pings off a moving fan. The things you are told at night are carried inward, they enter your dreams, they effortlessly become part of you.

So what are we to do while we wait for science to rediscover all this, for the data to prove it? What are we to do with this child, this completely unique constellation of human gifts and brilliances and burdens, this unique normal bright healthy radiant human child who stands before us today, right now, this very minute?

Like the proverbial fish who hasn't yet discovered the water, education researchers are still so limited by the WEIRD set of assumptions that confine their range of inquiry that they haven't realized that the element they live in is not the entire world.

We still need need wisdom, not data, to raise good children. Ironically, while the science of learning is still crude, primitive, the cultures some call "primitive" embed knowledge about human development that is sophisticated, profound, nuanced, and empirical, based on thousands of years of observation, intuition, experimentation, insight. Talk to gifted scientists, writers, artists, entrepreneurs. You will find they learned like a Yanomami child learns, through keen observation, experimentation, immersion, freedom, participation, through real play and real work, through the kind of free activity where the distinction between work and play disappears. Talk to a really good auto mechanic, carpenter, farmer, fiddle player, web designer, film editor, songwriter, photographer, chef, and you will find they learned the same way.

Education researchers are slowly beginning to peer through their spectacles at this phenomenon, but only just beginning. Like the proverbial fish who hasn't yet discovered the water, most are still so limited by the WEIRD set of assumptions that confine their range of inquiry that they haven't realized that the element they live in is not the entire world; they haven't seen that they are circling inside the glass walls of a fishbowl of their own creation, and that there is a universe of possibilities for learning that they have never dreamed of.

“It is in our idleness, in our dreams, that the submerged truth sometimes comes to the top,” a great artist once said. Science is a tool of breathtaking power and beauty, but it is not a good parent; it must be balanced by something broader, deeper, older. Like wind and weather, like ecosystems and microorganisms, like snow crystals and evolution, human learning remains untamed, unpredictable, a blossoming fractal movement so complex and so mysterious that none of us can measure or control it. But we are part of that fractal movement, and the ability to help our offspring learn and grow is in our DNA. We can begin rediscovering it now. Experiment. Observe. Listen. Explore the thousand other ways of learning that still exist all over the planet. Read the data and then set it aside. Watch your child eyes, what makes them go dull and dead, what makes them brighten, quicken, glow with light. That is where learning lies.

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