

An Interview with Jane Healy

Casey Walker: Let's begin with the notion that the child of today lives in a world that is alienated, and that the habits of mind in that world have physically changed their brains in ways that are antagonistic to the goals and values of education.

Jane Healy: That is my thesis in *Endangered Minds*, and I think that is why the book has touched such a resonant chord with educators and parents. The brain has certain, very clear developmental needs. You don't have to be a neuroscientist to notice that children tend to behave in certain ways at certain ages, or that their system is telling them that they need to do these kinds of things. Our contemporary culture is interrupting that flow, if you will, and intruding upon the child's world and the child's brain. Certain very, very salient stimuli such as television or Nintendo or computer software have the potential to disrupt that process in a way over which the child has very little control. The alarming thing to me is that adults are not only unconcerned about this, for the most part, but actually welcome these intrusions by thinking that they are going to make their kids *smarter* and *better purveyors of data and information*. This kind of thinking certainly illustrates the abysmal ignorance in our contemporary culture of the real needs of the growing child.

It's fascinating how vital interactive conversation, interior dialogues, and so forth, are in creating the child's neurological capacity for reason, reflection, abstract thought—and, how contemporary culture grossly impedes that linguistic development.

Yes, language is one of the very important brain shapers throughout childhood and adolescence. Of course language is tied to other factors. Motor development is very closely tied to language, interestingly enough. Some interesting new studies show that a child's speech is more closely related to his or her motor system than was previously realized. Now, for children, speech is the means by which we learn to mediate our own behavior, obey rules, control what we do, and anticipate what will happen next. All these patterns are tied to the motor system. Sophisticated instruments show that even when adults are thinking, their lips and tongues and larynx are actually moving as they 'talk silently' to themselves. And, for a child these connections are much more overt. Each time such actions are repeated by the child, the brain wires itself up a little more so that it becomes easier for the child to repeat that action the next time. This process, called *neuroplasticity*, underscores the extreme importance of what we encourage kids to do in any developmental period.

It's wonderful to know that the brain comes into the world endowed, really, with all of the neurons it's ever going to have. But, the weight and the size of the brain increases as a function of making connections and developing strong synaptic bonds between cell groups. For example, making neural networks by using language for thinking with actually



JANE HEALY, PH.D. has worked as a teacher, reading specialist, professor or administrator throughout all levels of education, from preschool to graduate school. She is a graduate of Smith College, holds a MA in reading from John Carroll University and a Ph.D. in educational psychology from Case Western Reserve University. Her postdoctoral work has focussed on developmental neuropsychology. She is now widely recognized as an author, lecturer, and consultant in applying brain research to learning situations in the classroom and home.

Her award-winning books have been translated into nine languages: *Your Child's Growing Mind: A Guide to Learning and Brain Development from Birth to Adolescence*; *Endangered Minds: Why Children Don't Think and What We Can Do About It*; and *How to Have Intelligent and Creative Conversations with Your Kids*. Her current book, *Failure to Connect: How Computers Affect Our Children's Minds—for Better and Worse*, is forthcoming from Simon & Schuster, September 1998.

Jane and her husband, Tom, lead active outdoor lives in Vail, Colorado.

increases the size and dimension of the brain—all of which enables the child to use these connections more automatically. It also builds the habit of mediation to use in elementary school, high school, and in life as an adult. It's troubling that there is so little language, oral language particularly, in the child's world today. What comes to the child from television, even from Sesame Street, doesn't count as language usage because the brain isn't processing the language so



much as it is more dominantly processing the constant visual stimuli.

I appreciated your curriculum for wisdom at the end of Endangered Minds: “conversation, thought, imagination, empathy, and reflection.” It becomes quickly apparent that wisdom, the practice of wisdom, is not associated with so many childhood activities geared to simple absorption and consumption.

Yes, very much so. It’s easier to absorb and consume, and if that’s what is stuck in front of your face all day every day, you may actually miss the experience of learning to use higher levels of imagination, reflection, and empathy. What we see in children today is very interesting because teachers report not only drastically increased incidences of Attention Deficit Disorder (ADD)—which signals problems in control systems, in rule governed behavior, and in the ability to plan and monitor and guide our own behavior—but also increased incidences with children who are having trouble with social empathy, who can’t negotiate rules on the playground.

Kids are more willing to hit than talk?

Yes, which can be explained in part by what they see modeled, but is also a function, I believe, of the fact that they haven’t had the time to learn to interiorize their own actions. In other words, they can’t reflect on their actions, they can’t picture them ahead of time, they can’t imagine what the result will be, and they can’t imagine the future because everything has been brought to them in an instant—and, if they don’t like it, they flick the button. This has been said over and over and over again, but the fact that it is being said over and over and over again, particularly by teachers, suggests that there may be some truth to it.

I also appreciated your emphasis that beyond the negatives of mediated images through TV, videos, and computers, there is also an impoverished or even destructive cultural milieu in terms of a “healthy childhood.”

Yes, children are exposed now, of course, to a great deal of inappropriate stimulation and information. I believe at least some of the over-excitement which clinically presents as Attention Deficit Disorder may actually be an anxiety response to sexual or violent material that is far beyond the child’s level of understanding. Certainly ADD problems do mirror anxiety, as well as other causes. I need to be clear in saying that there are certain brains that have constitutional difficulty in paying attention, but unfortunately our culture is not helping those brains develop strategies for attention and it may be pushing some kids off the deep end who wouldn’t be there otherwise.

The exposure of children to inappropriate adult-type material is interesting in terms of the developmental stages in the brain, and I’ve been particularly concerned with this while teaching late elementary and young adolescents. The pre-frontal cortex—which is the part of the brain that enables us to put abstract material into perspective, to manipulate ideas and understand the odds, say, of something happening—doesn’t experience its most intense growth spurt until late childhood, and, in many cases, through adolescence and into the twenties. It has been confirmed that children who are exposed to material meant for adults don’t actually have the brain structures, nor the practice in using them, to mediate or make sense of what they’re seeing.

It’s just overwhelming. . . .

Yes. I think overwhelming is a good word to use for what the media is doing to youngsters. A lot of our children are really functioning at the level of *survival* rather than being able to explore the world in their own good time—missing the types of stimuli, the types of information, and the types of relationships with cause and effect that the young brain needs to slowly knit together to make the fabric of adult intelligence. Children are being inundated—whether it be

loud music, too much visual stimulation, or premature pressure from academic learning inappropriate to developmental need—and these children are in a ‘fight or flight’ mode much of the time.

These kids are besieged first of all by adult expectations, and by adult neglect in helping them to develop the brains that will help them meet those expectations. It’s really no wonder that we have a lot of very nervous, very unhappy, very depressed, and very stimulus-seeking children. And it’s exactly what we adults can logically expect from childhoods interrupted by this kind of battleground.

I’m curious, too, because all of this implies not only a socially diminished person, but one who is less capable of perceiving the natural world, the way life works at large, too. It creates an atrophying of capacity to perceive ‘Self’ or ‘Other’ across the board.

Yes. I would say there is an atrophy of the capacity to reflect deeply on both issues, and self. And, if we think of that in terms of the upcoming body politic, we should be very concerned that everything is quick, everything is resolved in these kids’ worlds. The brain has certain critical or sensitive periods in which skills or capacities apparently require stimulation in order to develop. While we are a long way from understanding this process, neuroscience suggests strongly that if the child’s developmental needs during these periods are not met, we may actually close down some of those

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developmental windows.

This doesn't have to be a scare story for parents of preschoolers. What it does mean is that although human windows are wide, they may close. And, if a child reaches adolescence without ever having been exposed to reflective thought, language as a medium for planning and organizing behavior, or appropriate social learning, it may be true that these will be very difficult or even impossible to acquire.

What of the idea that much of the brain's development depends on interaction with the natural, physical world, that what we learn there and the acuties developed there, cannot be substituted by an artificial or mediated environment?

There is a lot in neuroscience research that would confirm that idea, and there is certainly a great deal in developmental psychology that says the same thing. For example, a child who is working with a set of maple blocks, is putting them together to figure out how to make a tower, build bridges, or construct houses is experiencing the world very differently from a child who is manipulating two-dimensional shapes on a computer screen. I deal with this at some length in my forthcoming book, *Failure to Connect*. I'm interested in looking at what computers are doing to the growing brain, and I believe there are profound consequences to depriving children of these, if you will, "ecologically valid experiences in the real world." I believe they are going to come out with a very different sort of brain than a child who is trying to experience all of this on a two-dimensional screen without physical cause and effect relationships. Parents will say to me, "Well isn't the mouse a hands-on learning experience? Isn't this a cause and effect?" No! The machine is opaque. The television is opaque, the computer is opaque. The child can't see the mechanisms of cause and effect. If I'm building a block tower or a bridge and I put too many blocks in the wrong place or I don't balance them right, it will fall over. There is an immediate lesson not only in cause and effect, but also in a lot of principles that I'm going to need to know later when I study physics.

Replacing hands-on with some kind of a "virtual learning" experience will, in fact, be appropriate later on when a child is moving into more abstract thinking. But for age-appropriate computer use, we have to think very hard about what is right for the younger child. Nobody has really looked at this in terms of technology of any kind. What is right for a fifteen year old is not going to be right for a five year old.

Isn't imagination also at stake if a child does not play with objects he or she can use as a symbol for something else—the block that becomes a boat on the carpet that becomes an ocean?

Yes. Much of human endeavor and cre-

ativity—as well as academic skills such as solving math story problems and understanding what we read—hinge strongly on visual or mental imagery. We need to be able to create and retain imagery, and also create imagery by calling up an image in our minds, moving it around and doing something with it, without seeing or physically touching anything. This ability seems to develop through a rather long process in which the child first externalizes the behavior by working with objects in the outside world and by interacting with people through oral speech. Only by about age seven is that all starting to come 'inside,' enabling us to use our minds without talking out loud, or without having to look at something that is physically in front of us. I believe the media are depriving children of the opportunity to practice and potentially even to learn how to make mental images—a recipe not only for a short attention span, but, frankly, for a very shallow mind.

Also lost is a critical sense of context for experience, yes?

All of the media tend to be very decontextualized as far as the child's experience is concerned. In *Endangered Minds*, I have a chapter criticizing Sesame Street. Although Sesame Street's producers are gradually improving its format, the program still retains too many flashes of decontextualized information which jump from one scenario to another far too quickly for the child's growing brain. Computers just exacer-

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bate the same problem.

How do you respond to criticism of the values, assumptions and goals of traditional academia?

I might at some level agree with many of the critiques. I think that certainly the next century is going to require not just more *advanced skills*, but *deeper level skills*, and by that I don't mean technological skills. We're going to need much deeper levels of reflection to contemplate the awesome developments happening now in biotechnology and in the possibilities of machines taking over our intellectual and/or personal lives. We particularly need to educate our children to approach problems and develop creative solutions for problems they haven't faced before.

Now, if we think critically about the ways "schooling" has been traditionally interpreted, we can see one of the things we've done wrong is to cut off reflection and innovative thinking. Children are not allowed to sit and think. They are constantly rammed through a curriculum to see how fast we can move them along. As they're marched from activity to activity, even the schedule of the school day doesn't allow time for anyone to reflect. And coming up with solutions or new ideas to new problems is quite different from the type of thinking required to be successful on some of the so-called achievement tests. The goals of schooling as they've been too-narrowly interpreted are very, very out-of-sync with what's going to be needed in our thinking for the

next century, and, in fact, is desperately needed right now.

That doesn't mean, at least in my mind, that our academic goals are necessarily wrong. To wit: reading, numeracy, an understanding of the "basics" of science and history, the ability to relate in a group of learners or workers—all of those things will continue to be important. The key word is "understanding," not just a forced march through a set body of subject matters. Moreover, a new set of "basics" are rapidly becoming important. Visual literacy is just one example of new types of thinking that should force us to broaden the curriculum. But, textual literacy is not going to go away. Children who can't reflect and who have never been able to pause long enough to be able to solve a difficult problem are going to be far down on the literacy scale.

It's a bit of a conundrum if a healthy brain is a brain that is interested and challenged and interacting with its environment and yet today's schools are full of kids who basically find reading so "hard" or "boring" that they disengage from what teaches coherence, reflection, and analytical skill.

This is very true. You might ask which is the chicken and which is the egg. If you can't analyze and you can't cohere your thoughts, and you have trouble reading, then sitting down with a book isn't going to be a way of learning any of these things. If we want children to read, parents and teachers must prepare their brains—limit exposure to electronic media, read to them, talk and listen to them, and allow them the gifts of play and imagination. The brain has its own wisdom and it doesn't necessarily choose to read at age four and five, which is the time our public schools seem to think that kids should be doing it these days. Just because a child can sound out words doesn't mean that he or she can read.

A related issue I propose in *Endangered Minds* is what I call the "starving executive" in the brain. Because the lobes of the prefrontal cortex, or the "executive system" as it is often called, are among the last to develop in our brains, the "starvation" of appropriate experience leading up to its use is frightening. Are we going to have an entire generation of people who cannot manage their own behavior, manage their world, plan ahead, reflect or abstract ideas, or relate appropriately to moral and social and ethical issues? Our research is inadequate in explaining how experience or lack of it impacts the development of the pre-frontal cortex.

Yet, research strongly links Attention Deficit Disorder problems we are now seeing with the pre-frontal executive system. I believe that we're already seeing a manifestation of this "starving executive" in our youngster's brains. If it continues to starve until it's twenty or thirty years old, it may be too late.

Do you take on these questions in your upcoming book?

I went further than I had in *Endangered Minds*, which explains neuroplasticity and how the brain is altered by different kinds of environments. In *Failure to Connect*, I look much more at specific applications of computer technology at different ages and how they may be used for better or for worse. I am not anti-computer, but I am very opposed to



inappropriate uses at the wrong ages. I believe that for children under age seven, any use is inappropriate. Interesting things will be happening as we get better software, but I've tried to examine all of these issues from the perspective of a developmental neuropsychologist, and tried to ask questions I don't believe are being addressed elsewhere: At what age, and how, should children be introduced to these kinds of technologies? How do we use these different ways and kinds of learning without interfering with the human interaction that plays such a critical role in any learning process?

In your mind, does the burden of proof, of resistance, then fall on critics and educators who can interpret the hard science, what is happening to the brain, what it all portends?

Yes, that is true; but the hard science, unfortunately, is hard to come by. First, these studies are very difficult to do. Morally and ethically, we can't deprive human brains of certain kinds of stimuli for clinical study. Secondly, there is very little funding to look at normal development. No one is particularly interested in this because it *doesn't seem to be a crisis!* And, much of what we are hearing now in the name of the *brain* is actually hypothetical, projected from the few things we do know. Brain research thus far has only given us clues, not prescriptions, about how we should raise our children and teach them. We can hope that within the next few years we'll have more of a meeting of the minds. I'm very happy to see some very reputable neuroscientists trying to draw links between what we know and what practitioners out in the field are trying to do for children. However, it's very, very easy to misinterpret brain literature, and we have to be very careful to use only good science to bolster the arguments we make.

Many people see the real difficulty of resisting economic forces, market forces, which increasingly perceive "childhood" as an extremely profitable enterprise.

Yes. There is a lot of very big money out there that wants all children to have all media and learn early on to be good little consumers. Childhood is becoming an extremely profitable enterprise and it certainly appears that it's not to the benefit of the children.

Originally published in *Wild Duck Review* Vol. IV No.2 on "Education".

A complete index of pdf downloads is available at: InstituteforInquiry.org.

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