

Endangered Minds

by Jane Healy

TV, VIDEO GAMES, AND THE GROWING BRAIN

Good-quality videocassettes for children may enhance cognitive and perhaps even language development if they encourage response from the child and if viewing is mediated by an adult.

In many households, even infants are constantly exposed; programs replace family conversation that builds language and listening skills, reading aloud, and games and activities in which adults show children how to solve problems, talk out future plans, or deal with their own emotions. Many parents who would earnestly like to redirect their family time find the kids so "hooked" on viewing, says Marie Winn, that they "reject all those fine family alternatives"--mainly because watching television is easier. Children from lower socioeconomic backgrounds watch the most of all.

Cognitive Consequences of TV Viewing

Research clearly shows that better students tend to watch less. Moreover, as viewing goes up, academic achievement scores eventually go down. Two scientists from Leiden University in the Netherlands found that television's negative effects on reading skills were particularly strong on the more advanced abilities needed for higher-level comprehension. Television:

- ★ displaces leisure reading and thus inhibits the growth of reading skills
- ★ requires less mental effort than reading
- ★ may shorten the time children are willing to spend on finding an answer to intellectual problems they are set to solve
- ★ has particularly negative effects for heavy viewers, socially advantaged children, and intelligent children

Television may have a hypnotic, and possibly neurologically addictive, effect on the brain by changing the frequency of its electrical impulses in ways that block active mental processing.

The "Zombie" Effect

"You raise kids on sweets, they become addicted to sweets. You raise kids on alpha, they get addicted to alpha, just like any hypnotic state," commented one neuropsychologist, himself a

member of the TV generation and the father of a young child (who is allowed to watch TV in highly selected quantities). He recognizes that parents in high-stress jobs may crave a soothing dose of alpha for themselves after a hard day's work, but believes this habit is not desirable for immature brains that have not yet firmed up all their connections. "The brain is programmed to repeat the same experience; neurons learn to replicate a pattern, that's how people learn, but we don't realize that what we are really learning is habits. Whenever children are doing something for a lot of the time, we should ask: Is this a habit we want them to have?" Computerized video games appear to be even more addictive for many children than television.

Mania for Mastery

Video games such as "Nintendo" augment some of the most riveting aspects of television viewing with the built-in reward systems of computer games. Here are the games' secret weapons:

- ★ feelings of control and mastery by the players
- ★ exact calibration of the level of difficulty to the player
- ★ immediate and continual reinforcement
- ★ escape from the unpredictability of human social/emotional relationships

Mastery leads to a sense of power, which feels especially good to a child in a world where things seem pretty much out of control, and where teachers order children around a lot of the time. Many of the games play directly on this need.

Can these games be educational? Some have suggested that they may be training children in skills that will be needed in the future but for which we don't yet know the uses. Many teachers comment, however, that frequent players have trouble readjusting from the micro-world to that of a classroom, which offers much less sensory "saliency," not a whole lot of power, and less individual attention and gratification. Some, of course, suggest that what we really need to do is make school as personally rewarding as the games.

"If we could just convince children that learning to read, and do math would make them powerful, too..." one teacher wistfully suggested.

Although some preliminary research suggests that perceptual-motor (specifically, eye-hand) skills may be improved by the games, there is apparently little transfer to school tasks, including writing. In addition, although the player's attention is, indeed, riveted, there has been no evidence of transfer of attention to other kinds of learning.

Brains That Read vs. Brains That Watch TV

One thing television does is it keeps kids from reading. Reading triggers certain experiences in the brain that just don't happen if you don't read. I think our brains are designed to symbolize and represent information in the way that we call language. If we

don't exercise it, we lose it. Television, even "Sesame Street", is not very symbolic. It makes things very tangible and easy to understand, but reading is the kind of exercise that causes the brain to develop differently because it uses that symbolic capability.

--Dr. M. Russell Harter

Intensive viewing has the potential for at least three effects on the growing brain, any of which could interfere with a child's natural potential for intelligence and creativity; (1) it may reduce stimulation to left-hemisphere systems critical for development of language, reading, and analytic thinking; (2) it may affect mental ability and attention by diminishing mental traffic between the hemispheres; (3) it may discourage development of "executive" systems that regulate attention, organization, and motivation. Without a solid research base, we can take only a speculative look at each of the three.

Mental and Physical Effort--or Withered Brains

Because of its late maturation, the corpus callosum may be extremely vulnerable to lack of practice. After an initial spurt of growth during the first two years of life, it probably continues to develop at a slow, relatively steady pace until somewhere between ages eight and fourteen. As the connections mature, the youngster must practice using them--through physical and mental activity. If the brain remains relatively passive during childhood and/or adolescence, it will be much more difficult to develop these skills later when the brain is less flexible.

Dr. Jerre Levy, biopsychologist at the University of Chicago, said, "I suspect that normal human brains are built to be challenged and that it is only in the face of an adequate challenge that normal bihemispheric brain operations are engaged. To the extent that children commit time looking at TV, they're not spending time reading. When a child reads a novel, he has to self create whole scenarios, he has to create images of who these people are, what their emotions are, what their tones of voice are, what the environment looks like, what the feelings of this environment is. These self-created scenarios are important, and television leaves no room for that creative process. It's just like muscles; if you don't exercise them they wither. If you don't exercise brains, they wither."

Dr. Sid Segalowitz, an authority on children's hemispheric development, commented.- "When we look at slides of blood flow in the brain when kids are reading, we can see so many different areas lighting up at once. Good readers tend to use both left and right hemispheres, including the prefrontal systems."

Spending time with something that doesn't challenge their brains much could impinge on development of prefrontal executive functions, such as control of thinking, attention, and general planning skills, said Dr. Segalowitz.

Conclusion: Video can Be Hazardous to Brains and Learning

The overall effects of television viewing and other forms of video on the growing brain are poorly understood, but research strongly indicates that it has the potential to affect both the brain itself and related learning abilities. Abilities to sustain attention independently, stick to problems actively, listen intelligently, read with understanding, and use language effectively may be particularly at risk. No one knows how much exposure is necessary to make a difference. Likewise, no information is available about the overall effects on intelligence of large amounts of time taken from physical exercise, social or independent play, pleasure reading, sustained conversation, or roaming quietly about in one's own imagination.

The notion that television overdevelops the right hemisphere is giving way to the much greater possibility that it under develops several areas and/or the connections between them. Not only left hemisphere language systems, but also higher-order organizational abilities, including the all-important control, motivation, and planning functions of the prefrontal lobes, may be in jeopardy for children who watch without expending much mental effort. All these functions may have sensitive periods when they are particularly susceptible to variations in stimulation, but it is difficult to determine which age periods are more critical than others or how much exposure is needed to cause physical effects.

The fact that reports from teachers so precisely mirror the "symptoms" of these same deficits should give us all pause. Surely, with the amount of time children in this country spend in front of the screen, we should demand better research on its effects. There must be a great untapped teaching potential there somewhere. Meanwhile, the best advice to parents seems to be the usual caveats:

- ★ Place firm limits on television and video use; encourage children to plan ahead for favorite shows and games.
- ★ Participate with children whenever possible.
- ★ Talk with the child about television content, methods of audience manipulation, point of view, etc.
- ★ If you want children to become readers, show them how to turn off the tube and pick up a book.
- ★ Remember, what is pleasantly relaxing to your brain may not be good for theirs.
- ★ Give substitute caregivers strict guidelines regarding TV and video use.

**Excerpts from *Endangered Minds: Why Our Children Don't Think*,
by Jane Healy, p. 199.**

- "80% of the books in this country are read by about 10% of the people ... with a steady and significant decline in the number of book readers under twenty-one."

- “Of a “typical” group of fifth graders, 50% read 4 minutes a day or less, 30% read 2 minutes a day or less, 10% read nothing. This same group watched an average of 130 minutes of TV per day.”
- “Book stores are supported primarily by people in their late thirties to mid-fifties.”
- “Young people have trouble with the mental organization and sustained effort demanded by reading. Coming to grips with verbal logic, wrestling one’s mind into submission to an author’s unfamiliar point of view, and struggling to make connections appear to be particularly taxing on today’s young intellectuals.”
- “...language physically builds the brain’s higher-reasoning centers.”
- “If parents want their kids to do well in school or get into a good college, they have to start with language. A rich vocabulary is the foundation, but the ability to describe, compare, and categorize with language is what leads to our ability to think in analogy -- that’s the highest level and it’s also what is tested on the SATs!”
- “...overwhelming visual presence of television and video may be exacerbating the problem [with verbal precision] by neglecting left-hemisphere language areas.”
- “Slipping syntax leads to fuzzy thought. Difficulties using grammatical language to identify relationships between ideas may account for many of the problems in logical thinking, science, and math.”
- “...good written language is different from colloquial talk written down. Awareness of its sound comes only from extensive listening to and/or reading quality prose and poetry. Moreover, expressing an idea on paper demands that the writer remove language from the here and now, gestures and “you know’s” just don’t work!”
- “The most difficult aspect of writing clearly ...is that it demands the ability to organize thought. The verbal tools that clarify relationships in reading and writing do the same job in math.”
- “Grammatical speech and its understanding seem to be the aspects of language acquisition most vulnerable to deprivation...children must use language in an interactional setting to discover and learn rules.”
- “Clearly, to be well prepared for reading, writing, listening, and speaking, children need to interact with increasingly advanced language during the years of childhood. But consider briefly the current situations:
- Busy schedules or uninterested caretakers militate against oral reading and thoughtful dinner-table conversation. Much of the “talk” that does take place, even in concerned families, may center around the mechanics of the moment (e.g., “Get your hat and mittens.” “When does your shift at Burger King end tonight?” “Finish your homework or no TV.”).
- The quality of language models in the media is highly variable. Even if the child chooses programs with more complex language, it may be of little use without an adult around to encourage verbal response.
- Most elementary-level children read textbooks that contain a thin, watered-down syntactic gruel.

- Time and motivation for reading are increasingly usurped by television and other nonliterary demands such as extra-curricular activities, computer practice, or drill type homework.”
- “It’s like, well, you know” does not fly on essay exams.