

## Understanding TV's effects on the developing brain

by Jane M. Healy, Ph.D.

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With new shows targeted to children as young as 1 year, parents are asking more questions about how television might be influencing their children. Pediatricians can help young families make wise decisions about family media consumption.

Neuroscientists have shown that environmental experiences significantly shape the developing brain because of the plasticity of its neuronal connectivity. Thus, repeated exposure to any stimulus in a child's environment may forcibly impact mental and emotional growth, either by setting up particular circuitry ("habits of mind") or by depriving the brain of other experiences. While appropriate stimuli – close interaction with loving caregivers; an enriched, interactive, human language environment; engrossing hands-on play opportunities; and age-appropriate academic stimulation – enhance the brain's development, environments that encourage intellectual passivity and maladaptive

behavior (e.g., impulsivity, violence), or deprive the brain of important chances to participate actively in social relationships, creative play, reflection and complex problem-solving may have deleterious and irrevocable consequences. In addition, trying to plunge youngsters into academic learning, when they should be personally investigating the three-dimensional world, risks bypassing important aspects of development.

Potential hazards in a media culture

Negative outcomes have been observed in today's schools, which appear to be related to too much of the wrong kind of media exposure. An "epidemic" of attention deficit disorder, behavioral problems, faltering academic abilities, language difficulties (which extend to reading comprehension as well as oral expression), and weak problem-solving skills are reported by teachers across the United States. Of course, parents' rushed life-styles and societal changes are partially responsible, but a growing body of research on television viewing clearly supports its causation role, with different children's tolerance thresholds varying widely.

Too much television – particularly at ages critical for language development and manipulative play – can impinge negatively on young minds in several different ways including the following:

Higher levels of television viewing correlate with lowered academic performance, especially reading scores. This may be because television substitutes for reading practice, partially because the compellingly visual nature of the stimulus blocks development of left-hemisphere language circuitry. A young brain manipulated by jazzy visual effects cannot divide attention to listen carefully to language. Moreover, the "two-minute mind" easily becomes impatient with any material requiring depth of processing.

The nature of the stimulus may predispose some children to attention problems. Even aside from violent or overly stimulating sexual content, the fast-paced, attention-grabbing "features" of children's programming (e.g., rapid zooms and pans, flashes of color, quick movement in the peripheral visual field, sudden loud noises) were modeled after advertising research, which determined that this technique is the best way to engage the brain's attention involuntarily. Such experiences deprive the child of practice in using his own brain independently, as in games, hobbies, social interaction, or just "fussing around." I have talked to many parents of children diagnosed with attention deficit

disorder who found the difficulty markedly improved after they took away television viewing privileges. The brain's executive control system, or pre-frontal cortex, is responsible for planning, organizing and sequencing behavior for self-control, moral judgment and attention. These centers develop throughout childhood and adolescence, but some research has suggested that "mindless" television or video games may idle this particular part of the brain and impoverish its development. Until we know more about the interaction of environmental stimulation and the stages of pre-frontal development, it seems a grave error to expose children to a stimulus that may short-change this critical system.

What can pediatricians do?

Take a media history or ask about the amount of screen time as part of routine examinations. Depending on a child's age, you may need to ask the child, rather than the parent, to get a candid response. Suggest clear limits on viewing time, depending on age. Even one hour of screen time a day is a lot for preschoolers; one to two hours is maximum for older children.

Children in the elementary grades and older can help negotiate reasonable rules and a plan for weekly TV viewing. Television should be turned on to watch chosen programs, not as constant background.

Homework comes first and should be done without television.

Parents of infants should start thinking about setting limits on inappropriate or excessive media use. Parents should try to agree on

a

family policy, discussing how early they want to start their child on the TV habit.

If a child shows symptoms of attention difficulty, suggest severely curtailing or eliminating television for a trial period.

Adults should keep a close and critical eye on the content of shows watched by children of different ages.

Children who have television sets in their rooms tend to watch more television with less supervision. Suggest keeping TV sets in a family room where parents can "tune in" regularly.

Adults can "mediate" viewing and make television a learning experience

by sitting with the child, discussing, asking questions, and helping with interpretation of content.

Valuable learning can be gained from this medium; it is up to adults to ensure that children's minds emerge enriched rather than endangered.

Jane Healy is an educational psychologist and author of *Endangered Minds: Why Children Don't Think and What We Can Do About It* (Touchstone Paper, 1991) and *Your Child's Growing Mind: A Guide to Learning and Brain Development from Birth to Adolescence* (Doubleday, 1994).

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