

Is There a "Myth of the First Three Years"?



- While some parents recognize that more extreme levels of stimulation are not necessary for healthy development, they feel that extra stimulation can do no harm. How would you respond to that feeling? Are there ways in which too much stimulation during infancy could be harmful?
- Both readings are addressing the provocative argument made by John T. Bruer in his book *The Myth of the First Three Years*. Why do you think this book was so divisive to those interested in lifespan development? Broode points out ways that our scientific understanding of early brain development is easily misinterpreted by a culture interested in "building better brains." Why might this be a cultural belief that is not universally shared?
- Zero to Three asserts that infancy is a special and distinct period in lifespan development. Beyond brain development, why is this the case and what really differentiates the changes of infancy from changes at other stages?
- Some developmental scientists think that the term "critical period" is a misleading term, and that a term such as "sensitive period" may be more appropriate. What difference might various labels make to how we understand infancy?

Suggested Readings

J. Bruer, "Education and the Brain: A Bridge Too Far," *Educational Researcher* (November 1997)

J. Bruer, *The Myth of the First Three Years: A New Understanding of Early Brain Development and Lifelong Learning* (Free Press, 1999)

L. Elliot, *What's Going on in There? (Bantam Books, 2000)*

S. Gerhardt, *Why Love Matters: How Affection Shapes a Baby's Brain* (Brunner-Routledge, 2004)

H. Guidberg, "The Myth of 'Infant Determinism,'" www.splked-online.com (October 2004)

K. Hirsh-Pasek and R. M. Golinkoff with D. Eyer, *Einstein Never Used Flash Cards* (Rodale, 2003)

Are There Good Reasons to Allow Infants to Consume Electronic Media, Such as Television?



YES: Victoria Rideout, Elizabeth Hamel, and the Kaiser Family Foundation, from "The Media Family: Electronic Media in the Lives of Infants, Toddlers, Preschoolers and Their Parents," A Report from the Kaiser Family Foundation (May 2006)

NO: Daniel R. Anderson and Tiffany A. Pempek, from "Television and Very Young Children," *American Behavioral Scientist* (January 2005)

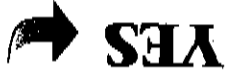
ISSUE SUMMARY

YES: Victoria Rideout, Elizabeth Hamel, and the Kaiser Family Foundation find that television and electronic media allow families to cope with busy schedules and are of value to parents of infants

NO: Psychologists Daniel Anderson and Tiffany Pempek, instead focus on infant learning. In their review of available literature they concur with the American Academy of Pediatrics in recommending that infants should have no exposure to television.

In this technology age most people at all stages of the lifespan consume massive amounts of electronic media. For better or worse, the media and market forces tend to move faster than scientific efforts to understand the impact of that consumption. This fact is particularly evident in the contemporary controversy regarding electronic media and infancy. Despite a 1999 policy statement from the American Academy of Pediatrics recommending against any exposure to electronic screens during infancy, there is a growing market of media specifically targeting very young children.

So what is the impact of this media on infants and the young mind during a time of life when so much change and development is taking place? The short answer is that no one is entirely sure. Parents and media companies hope that the impact might be positive—it seems logically possible that well-designed media could be a positive and educational influence on a developing mind.



The Media Family

Introduction

Today's parents live in a world where media are an ever-changing but increasingly important part of their family's lives, including even their very youngest children. Baby videos designed for one-month-olds, computer games for 9-month-olds, and TV shows for one-year-olds are becoming commonplace. An increasing number of TV shows, videos, websites, software programs, video games, and interactive TV toys are designed specifically for babies, toddlers, and preschoolers.

One thing that hasn't changed is that parents have a tough job—in fact, maybe tougher, often with both husband and wife working and juggling complex schedules, and with a growing number of single parents. In this environment, parents often turn to media as an important tool to help them manage their household and keep their kids entertained.

And for many parents, media are much more than entertainment: from teaching children letters and numbers, to introducing them to foreign languages or how to work with computers, many parents find the educational value of media incredibly helpful.

"My daughter is learning a lot from the different shows she watches. She's so into it. I think it's important."

[Mother of a 1-3 year-old, Irvine, California]

At the same time, there is growing controversy about media use among very young children, with pediatricians recommending no screen media for babies under two, and limited screen time after that. Most child development experts believe that the stimuli children receive and the activities they engage in during the first few years of life are critical not only for their physical well-being but also for their social, emotional, and cognitive development. But scientific research about the impact of media use on babies and toddlers has not kept pace with the marketplace. As a result, very little is known for sure about what is good and bad when it comes to media exposure in early childhood. On the positive side of the ledger, research does indicate that well-designed educational programs, such as *Sesame Street*, can help 4- and 5-year-olds read

Or, at the very least, some would argue that electronic media could do no harm. Right? Actually, many scholars are concerned that exposure to electronic media at very young ages may in fact have a negative impact on developing capacities for language, attention, and other crucial cognitive skills. As such, groups such as the *Campaign for a Commercial Free Childhood* have been vociferous in their opposition to electronic media marketed toward infants. At the heart of both sides is the core question for infant development: what is the healthiest environment for the development of a young child?

From the perspective of many parents, the healthiest environment is one in which electronic media provides a safe and easy forum for engagement. As Victoria Rideout, Elizabeth Hamel, and the Kaiser Family Foundation explain in their effort to understand the role of electronic media in contemporary families, many parents rely on electronic media to help create just such an environment. In surveys and interviews with diverse groups of parents it becomes clear that parents are aware that certain types of electronic media can be problematic for infants but that there may be a thoughtful and healthy way to use other media formats to manage the challenges of raising children in contemporary society. They suggest that exposing children to electronic media is simply a reality of modern life, and that is not necessarily a bad thing.

Psychologists Daniel R. Anderson and Tiffany A. Pempek, on the other hand, focus their attention specifically on the developing child. Based on their review of evidence, the influence of electronic media on infants seems almost entirely negative. Rather than just being a harmless distraction, Anderson and Pempek draw on research suggesting that exposure to electronic media may actually associate with deficits in critical developmental capacities such as language and attention.

POINT

COUNTERPOINT

- Electronic media is a way that parents can manage the increasing demands on their time.
- Infants may actually be watching less TV now than they were a decade ago, so parents are becoming more cautious.
- The preliminary research finds that TV is not a good way to educate infants.
- Infants learn less from television than from actual life experiences.
- The research is not very up to date—the marketplace for infant media has moved faster than the science.
- Children may pick up things they would otherwise not be exposed to (such as different languages and types of people).
- Electronic media may actually cause cognitive problems such as language and attention deficits.

and count and that children that age also benefit from pro-social messages on TV that teach them about kindness and sharing. On the other hand, studies have also found that exposure to television violence can increase the risk of children behaving aggressively and that media use in early childhood may be related to attentional problems later in life. And while the producers of early childhood media believe their products can help children learn even at the earliest ages, other experts worry that time spent with media may detract from time children spend interacting with their parents, engaging in physical activity, using their imaginations, or exploring the world around them.

One thing this study makes clear is that for many families, media use has become part of the fabric of daily life. Parents use TV or DVDs as a "safe" activity their kids can enjoy while the grownups get dressed for work, make a meal, or do the household chores. Working parents who worry that they don't have enough time to teach their kids the basics feel relieved that educational TV shows, videos, and computer games are helping their kids count and learn the alphabet and even say a word or two in Spanish. When children are grouchy, or hyper, or fighting with their siblings, moms and dads use TV as a tool to help change their mood, calm them down, or separate squabbling brothers and sisters. Media are also used in enforcing discipline, with a TV in the bedroom or a handheld video game player offered as a powerful reward or enticement for good behavior. Everyday activities, such as eating a meal or going to sleep, are often done with television as a companion. And media are used to facilitate moments of transition in daily life: waking up slowly while groggily watching a couple of cartoons on mom and dad's bed, or calming down to a favorite video before bedtime.

"Media makes my life easier. We're all happier. He isn't throwing tantrums. I can get some work done."

[Mother of a 4-6 year-old, Irvine, California]

Many parents of young children are quite enthusiastic about the role media plays in their lives and the impact it has on their kids. They are grateful for what they see as higher quality, more educational choices than when they were young, and for the wider variety of options they now have available. They see their children learning from TV and imitating the positive behaviors modeled on many shows. But it appears that the primary reason many parents choose to bring media into their children's lives is not because of the educational benefits it offers kids, but because of the practical benefits it offers parents: uninterrupted time for chores, some peace and quiet, or even just an opportunity to watch their own favorite shows.

At the same time, many parents feel an underlying guilt about their children's media use: primarily a sense that they should be spending more time with their kids and that they shouldn't be feeling so relieved at not having to be responsible for teaching their children their ABCs. Some express a suspicion that they may have set in motion something they soon won't be able to control: that today's good-natured educational shows will lead to tomorrow's sassy cartoons,

and to next year's violent video games. And others also bemoan the fundamental changes they see from their own childhoods when they were more likely to play outside or to use their imaginations to make up their own play activities indoors.

"It makes life easier now, but in the long run, when they're older and starting to run into all these problems, I think I'll wish I wouldn't have let them do it when they were five."

[Mother of a 4-6 year-old in Columbus, Ohio]

Parents' beliefs about media—and their own media habits—are strongly related to how much time their children spend with media, the patterns of their children's use, and the types of content their children are exposed to. Two- and four-year-olds watching *CSI* and *ER* with their moms don't seem to be as rare as one might think. Parents who are big TV fans and hate the interruptions from their little ones are more likely to get a TV for their child's bedroom. Dads who play a lot of video games use that activity as a way to bond with their sons. And parents who think TV mostly hurts children's learning are more likely to limit their children's viewing and less likely to leave the TV on during the day. In short, children's media use is as much or more about parents as it is about children.

This report presents the results of a national study to document how much time infants, toddlers, and preschoolers are spending with media, what types of media they're using, and what role media are playing in their environments. The study has two parts: a nationally representative telephone survey of parents about their children's media use; and a series of focus groups with parents, for a more in-depth discussion of issues raised in the survey. All statistical findings in this report are from the national survey; all quotes are from the focus groups.

The study concerns children ages 6 months to 6 years old. It focuses primarily on the role of electronic screen media in young people's lives, including television, videos or DVDs, computers, and video games. Occasional references to "children 6 years and under" or "children six and under" are made as shorthand and refer to children ages 6 months to 6 years old. References to children "under two" refer to children 6-23 months old. . . .

One thing this study makes clear is that even the youngest children in our society have a substantial amount of experience with electronic media. Perhaps not surprisingly, almost all children ages 6 months to 6 years old have watched television (94%) and videos or DVDs (87%). But use of "new" media among this age group also abounds. More than four in ten (43%) have used a computer, about three in ten (29%) have played console video games, and just under one in five (18%) have played handheld video games.

In a typical day, 83% of children ages 6 months to 6 years use some form of screen media, including 75% who watch television, 32% who watch videos or DVDs, 16% who use a computer, and 11% who play either console or handheld video games. The percent of children who watch TV in a typical day is somewhat smaller than the share who spend any time reading or being read to (83%) and listening to music (82%).

Indeed, in focus groups parents speak about "getting" their kids to watch certain videos or TV shows, or about DVDs being better than TV because they're longer and afford a longer chunk of time in which to get things done.

"They wake up and get to watch TV while I shower and get dressed. It keeps them in my sight line."

[Mother of a 4-6 year-old, Denver, Colorado]

Many parents speak of the numerous demands on their time and of their strong need to keep their kids occupied while they get chores done. As a mom from Denver said about her 1-3 year-old, "If he is watching TV, I can get other things done. I don't have to constantly watch him." Some parents spoke about the fact that they simply can't let their kids play outdoors unsupervised. Others pointed out how much trouble their children could cause inside the house if they are left unmonitored: "If the TV isn't on, he's putting the 'Orange Glo' all over my daughter's bedspread. That makes more work for me."

"He's a good little boy. He won't bother anything. He won't get into stuff. He's glued to the TV."

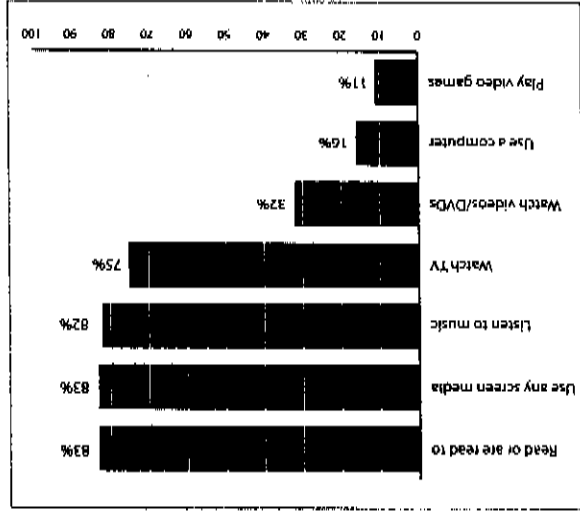
[Mother of a 4-6 year-old from Columbus, Ohio]

Many parents also talked about how important it is for them to have "me" time, which often means getting their kids set up with a TV show or a DVD. The mother of a 4-6 year-old from the Denver area pointed out that "Being an adult is hard. There are times when my interacting with my children is best served by me having an opportunity to allow them to do something alone so I can regroup. When I got laid off a couple of weeks ago, I didn't know it was coming. I got blindsided. I couldn't have interacted with my children that night. I couldn't have done it. Let's watch *Finding Nemo*, kids. Here are some chicken strips, here are sippy cups—I'll see you in about an hour and a half."

The Educational Value of Television

In the national survey, parents are fairly evenly split on whether, in general, TV mostly helps (38%) or mostly hurts (31%) children's learning (22% say it doesn't have much effect either way). But in focus groups, many parents cited "learning" as one of the positive things about television, and indicated that they thought their children were learning from TV. Several mothers mentioned being surprised by their children saying a word in Spanish or being able to count. The mother of a 4-6 year-old from Denver said, "My daughter started saying something to me in Spanish—I don't know a word of Spanish. [TV is] definitely educational." Another Denver-area mom said, "My 2-year-old can count to 10. I haven't really practiced that much with her. She did it. Where else would she have possibly learned it?"

Figure 1 In a Typical Day, Percent of Children 6 and Under Who . . .



Note: Screen media includes TV, videos/DVDs, video games, or computers.

Kids who watch television and those who watch videos or DVDs spend an average of about one and a quarter hours on each (1:19 for TV and 1:18 for videos/DVDs), while those who play video games and use computers spend an average of just under an hour on each (0:55 for video games and 0:50 for computers). On the whole, the 83% of children who use screen media in a typical day spend an average of just under 2 hours (1:57) doing so. . . .

"For our little guy, TV time is all of us on the couch together. The cat comes and sits with us. We'll talk about what's going on. If it's *Blues Clues*, we'll answer back. We only do 20 minutes a night."

[Mother of a 1-3 year-old, Irvine, California]

Parents' Attitudes about Children's Media Use

Why Parents Want Their Kids to Use Media

Focus groups indicate that many parents are encouraging their children to spend time with media because they think it's good for their kids, and because it gives them a chance to get things done without their children underfoot.

"Out of the blue one day my son counted to five in Spanish. I knew immediately that he got that from *Dora*."

[Mother of a 1-3 year-old, Columbus, Ohio]

Mothers are also enthusiastic about the different experiences children are exposed to through television and videos. "[My son] has developed a passion about the ocean and angler fish because of *Nemo*," said one Denver mom. "He fell in love with that character. That door wouldn't have even been open if it wasn't for *Finding Nemo*." Another Denver mother said her 4-6 year-old son was "always telling me what is right and wrong from the things he sees on TV. It has opened doors in being able to talk to him." Several mothers mentioned the "diversity" TV brings their young children. As one mom from Columbus said, "I think they are exposed to a little bit more diversity. I think that it's good for them to be comfortable with that. . . . to know that it's okay for everyone to be different."

"My daughter knows . . . her letters from *Sesame Street*. I haven't had to work with her on them at all."

[Mother of a 1-3 year-old, Columbus, Ohio]

"It shows them a world that they aren't familiar with. We live in the suburbs. She watches *Dora* and learns a little bit of Spanish."

[Mother of a 4-6 year-old, Columbus, Ohio]

Some parents feel they need media to help them with their child's education. As one mother from Irvine, California, said, "I think they (media) are in a way necessary. So much more is expected of kids these days. . . . When you go to kindergarten now, you can't just go and play with toys. You have to know how to write your name and spell. It's all about what you know." Most parents seemed to think their children would learn what they needed to know just fine without media, but they would be under a lot more pressure to do the teaching themselves. As the mother of a 1-3 year-old from Denver said, "I don't think it's important to use it as a learning tool, but for me to use it to keep them occupied."

The national survey indicates that there is a relationship between parents' attitudes about the educational value of television and how much time their children spend watching TV. Children whose parents think TV mostly *hurts* learning are *less likely* to watch than those whose parents say it mostly helps or doesn't have much effect one way or the other. For example, 48% of children whose parents say TV mostly hurts learning watch every day, compared to 76% of those whose parents believe TV mostly helps children's learning. Likewise, children whose parents say TV mostly hurts learning spend an average of 27 minutes less per day watching than children whose parents think TV mostly helps.

Table 1

Relationship of Parental Attitudes to Children's Media Use		Parent Attitude Towards TV	
Children's Media Use	Mostly helps	No effect	Mostly hurts
Percent who watch TV on typical day	84%±	75%±	64%
Mean hours watching TV for kids who watched	1:27-	1:16	1:12
Mean hours watching TV for all kids	1:12±	0:57~	0:45
Percent who watch TV daily	76%~	71%~	48%

±Significantly higher than "No effect"; ~Significantly higher than "Mostly hurts"

It is not possible to tell from this survey whether parents who think TV hurts learning are more likely to restrict their children's viewing, or whether parents whose children spend more time watching TV develop a higher opinion of television's role in learning, or whether some other factor is influencing this relationship.

"I just don't have time to sit on the computer with him to try and teach him all this other stuff. . . . I'm not going to put him on it if I have to teach him how to use the mouse or something else. . . . I am like—play it at your dad's and break his computer."

[Mother of a 1-3 year-old, Denver, Colorado]

Educational Value of Computers

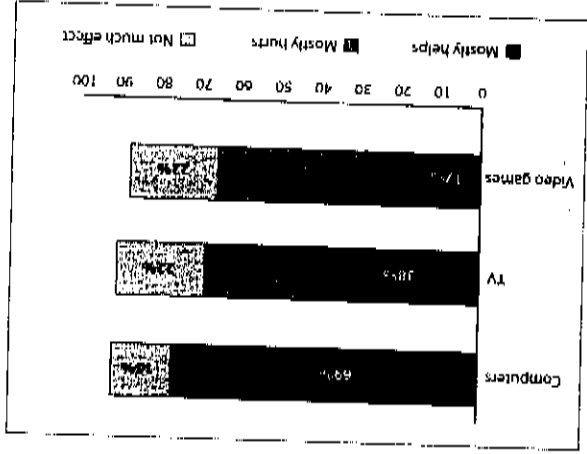
When it comes to using computers, most parents think this activity helps rather than hurts learning (69% vs. 8%, with 15% saying it doesn't have much effect). Many parents feel that since their children are going to have to use computers later in life, getting familiar with them at an early age is a benefit in and of itself, regardless of what they're doing on the computer. One mother from Irvine said, "Anything they are doing on the computer I think is learning." Another mom from Columbus said, "I think they get more skills from the computer. Our world is so computer-oriented. I certainly didn't know how to use a computer when I was 3. . . . If I had a choice of the computer or TV, I would definitely choose the computer."

"They'll survive without the video games and TV. . . . I don't think they'll survive without the computer. When they're older, they aren't going to have a cashier to check them out at Kroger."

[Mother of a 4-6 year-old, Columbus, Ohio]

Figure 2

Percent of Parents Who Say Each Medium Mostly Helps or Hurts Children's Learning:



Focus group parents also felt that video games tended to be more violent, especially those for the older kids. Some worried about the types of games young children see their older siblings play: "My older kids play... a lot of the violent stuff. They let [my younger son] play one time, and the poor child was traumatized... He couldn't even sleep that night. He kept telling us about it all night." Many parents noted that their younger children tried to mimic either their dad or their older siblings by playing with game controllers, but just got frustrated because they couldn't do it properly.

Conversations with Pediatricians

Relatively few parents (15%) say that their pediatrician has ever discussed their child's media use with them. Parents with higher income and more formal education are more likely to say their pediatrician has discussed this with them (for example, 22% of college graduates, vs. 11% of those with a high school education or less). There is no indication from these data that children whose parents that the household media environment is different for these children than for those whose parents haven't had those discussions. Even the youngest children are growing up in homes where media are an integral part of the environment—with multiple TVs, VCRs, computers, and video game players in the home; TVs left on much of the time (many with large screens and surround sound); whether anyone is watching or not; TVs in children's bedrooms, and portable DVD players and handheld video game players ready for children on the go.

Other focus group mothers pointed to certain features of the computer that they found beneficial, such as interactivity or the parent being able to control the content through specific software. The mother of a young child from Irvine said, "The computer is far more interactive than TV. His mind is more active when he is using the computer. It's more of an analysis and figuring things out." A Denver-area mom (of a 4-6 year-old) said, "I think you have more control over the computer. If they're watching TV, you don't know what the lesson is going to be. With the computer you can put in specific software or go to a specific website."

"I don't spend nearly as much time with my son as I need to. He has learned huge amounts through the video and computer games that we have... I'm very grateful for the computer games. My kid learned his colors and letters from the computer. It's been very beneficial to us."

[Mother of a 1-3 year-old, Irvine, California]

Another mother from Denver (of a 1-3 year-old) described one of the CD-ROMs she and her daughter enjoy using: "They have a 5-a-day vegetable game. My daughter doesn't like to eat, so we show her all the different foods that are good for her. We make things on the computer, and then we will go downstairs and make them to eat. She seems to eat better after we play the food game."

Despite the advantages some focus group mothers pointed to, many others expressed a sense that most of what children can learn from a computer they can also learn from TV or videos—without as much parental oversight and with-out as much risk to expensive equipment. As one mom from Irvine said, "If they're on the internet, I have to be right there with them. That can be annoying because I don't always have the time to sit there while my 3- and 6-year-old go on the internet. It isn't that fun for me to watch the same *Dora* clip 20,000 times. I would rather do other things." Some pointed to the safety of the Nickelodeon TV channel over the Nick Jr. website: one mom said, "If I leave my son on Nick Jr. for just a minute, he will click on every possible ad or whatever, and there will be a thousand things open," while another noted, "If they're watching Nickelodeon, you know they aren't going to have any porn sites popping up."

Educational Value of Video Games

According to the national survey, most parents think playing video games hurts rather than helps learning (49% vs. 17%, with 22% saying not much effect). In the focus groups, parents didn't indicate having as much experience using educational video games as they did with TV, computers, or videos and DVDs. One mother of a 4-6 year-old from Columbus did have experience with an educational video game: "My daughter and I played a Mickey Mouse (video) game where you had to... move the cursor around to find different things. If you find the remote, you can go back to the TV, and it will show a clip. It's like thinking."

Television

Nearly all children ages 6 months to 6 years (99%) live in a home with at least one television. Eighty-four percent live in a home with two or more televisions, and nearly a quarter (24%) live in homes with four or more TVs.

A large majority (80%) of these children live in homes that have cable or satellite TV, and about half (53%) live in homes where the largest TV is 30 inches or larger (25% have TVs 40 inches or larger). Four in ten (40%) have a television with surround sound, and two in ten (20%) have VCR or some other type of digital video recorder. The presence of TiVo in the home was not related to either the amount or type of shows children watched.

VCRs and DVD Players

Nearly all (93%) children ages 6 months to 6 years have a VCR or DVD player in the home, and a third (33%) have a portable DVD player. In addition, nearly one in five (18%) have a television or DVD player in their car.

"While my daughter has her princess movie in, my son can be upstairs playing his *Blues Clues* CD-ROM. . . . It gives them their own space and their own quality time to be apart."

[Mother of a 1-3 year-old, Denver, Colorado]

Video Games

Half (50%) of children 6 years and under have a console video game player in the home, and nearly three in ten (28%) have a handheld video game player. Children ages 4-6 are more likely than children ages 0-3 to live in homes with a console video game player (54% vs. 46%), and with a handheld video game player (34% vs. 22%).

"I told my kids we weren't going to get an Xbox. . . . because we have the computer. To me it's just one more thing that I would have to fight over with them. I'm big on entertaining yourself-go play. Don't just sit here vegetating."

[Mother of a 1-3 year-old, Columbus, Ohio]

Computers

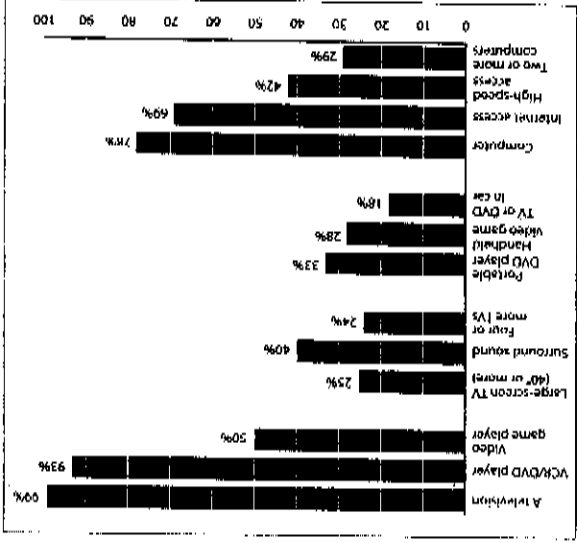
More than three-quarters (78%) of children 6 years and under live in a household with a computer, and about three in ten (29%) live in a household with two or more computers. Nearly seven in ten (69%) have Internet access in the household, including 42% who have high-speed Internet access (26% have dial-up access).

Calmng Children Down or Pumping Them Up

Just over half (53%) of parents say that TV tends to calm their child down, while only about one in six (17%) say that TV gets their child excited. The rest

Figure 3

Percent of Children Age 6 and Under Who Live in a Home with . . .



of parents either say: TV calms and excites their child equally (9%); it depends on what the child is watching (8%) or on the child's mood or time of day (3%); or they don't know (10%). Television's effect on children does not vary reliably with the child's age or gender. Children who watch mostly entertainment shows are more likely to be calmed by TV than are those who watch mostly educational shows (72% vs. 50%).

"When he watched the *Buzz Lightyear of Star Command* video from the library, he was a monster child. The very next week I got *Teletubbies*, and it was completely opposite. He was very mellow."

[Mother of a 1-3 year-old, Columbus, Ohio]

In focus groups, parents describe a range of responses their children have to TV. A number of parents talked about how TV can calm their children down. The mother of a 4-6 year-old from Irvine said, "My son is really hyper. That's a time when I can get him to actually calm down and watch a little TV. . . . He will slow down and that helps change his mood. . . . It's much better for him and for me."

"She plays along with what she's watching most of the time. She's dancing. She's not being a couch potato. . . ."

[Mother of a 4-6 year-old, Columbus, Ohio]

But another mother, from Columbus, said, "My 2-year-old is so rambunctious you cannot turn your back for a second. With TV I notice that his temperament changes. He gets more wild and hyper when he is watching the stuff that he likes." Many parents pointed to a positive energy their kids get from watching TV as well as dancing and responding to the screen. "My kids will stand in front of the TV and hop and clap," a mother of a 1-3 year-old from Columbus said. Others describe kids who "zone out" or appear hypnotized by the TV. "The TV kind of turns their brain off, that's what I don't like," said one Denver mother.

"I think [TV] builds confidence and self-esteem. My daughter was very inverted until she was about three and a half. She was very shy. . . . By her acting out with her imaginary friends on the TV or *Dora*, it just really brought her out. It really opened her up in preschool and she is really doing well."

[Mother of a 4-6 year-old, Irvine, California]

Imitating Behavior from TV

Nearly seven in ten parents (68%) say they have seen their child imitate some type of behavior from TV. Far more parents say their child imitates positive behavior, such as sharing or helping (66%), than say their child imitates aggressive behavior, like hitting or kicking (23%). Parents of children ages 4-6 years (83%) and of children ages 2-3 years (77%) are more likely than parents of children under 2 years (27%) to say their child imitates any type of behavior.

"She was going around kissing everyone with her mouth open. She wanted to be like Ariel and Eric." (From Disney's *The Little Mermaid*.)

[Mother of a 1-3 year-old, Columbus, Ohio]

Boys in both age ranges (2-3 and 4-6) are more likely than girls to imitate aggressive behavior (nearly half—45%—of parents of boys ages 4-6 say their child imitates aggressive behavior). Children who primarily watch kids' educational programming are more likely than those who primarily watch kids' entertainment shows to imitate positive behavior (76% vs. 59%).

"My daughter just sits in the beanbag chair watching TV. If it's something that she's really into, she just sits there with her mouth hanging open."

[Mother of a 4-6 year-old, Columbus, Ohio]

Response to Commercials

In focus groups, when asked to list the positives and negatives of TV for their children, many parents mentioned commercials as a negative. But when asked how many commercials their children were exposed to in a typical day,

Table 2
Imitating Positive or Aggressive Behavior from TV

Ages	2-3 Years		4-6 Years	
	Boys	Girls	All	Boys
Percent whose parents say they . . .	All	Boys	Girls	All
Imitate positive behavior	75%	75%	80%	79%
Imitate aggressive behavior	24%	31%	17%	45%
Imitate neither	23%	20%	25%	17%

*Significantly higher than ages 2-3; †Significantly higher than ages 4-6; ‡Significantly higher than girls in this age range.

most parents seemed at a loss to guess, and estimates ranged from 5 to 100. Many parents indicated that their children liked commercials and were influenced by them. "She pays attention to the commercials more than the shows," said the mother of one 1-3 year-old from Columbus. "That's what gets her attention." Several talked about their children memorizing things from commercials. A Denver mom (of a 4-6 year-old) said, "My kids are—I want that, I want that, I want that. They commit things to memory for months." But one mother said she thought the commercials just went right past her kids: "I don't think they watch them. . . . I don't think they're paying attention."

"I want this, I want that, I want chocolate cereal."

[Mother of a 1-3 year-old, Denver, Colorado]

At the same time, a couple of parents mentioned that ads give them gift ideas, and they're grateful for them. The mother of one 1-3 year-old girl from Columbus said, "My daughter's birthday is next week. She saw a commercial for a Strawberry Shortcake doll toy. She said she wanted it for her birthday. If she hadn't seen the commercial, she wouldn't have known about it. I was glad that I was in the room and she could tell me that."

"I would be at a total loss if it wasn't for commercials at Christmas time. I wouldn't know what to get my kids. They know what they like when they see it on TV."

[Mother of a 4-6 year-old, Denver, Colorado]

Among parents whose children watch TV at least several times a month, the vast majority (83%) say their child watches mostly shows specifically for kids around his or her age (2% say the child watches both types of shows about equally). More parents say their child watches mostly educational shows

"I've found that my kids are usually about a year ahead of what the games or movies say. My son is two so I look at ones for 3-4 year-olds. I always pick one that is above their level to help them learn."

[Mother of a 1-3 year-old, Denver, Colorado]

Many parents in focus groups say they are guided by brands in choosing what their kids can or can't watch. One Denver mom said that children's TV shows are "all pretty much educational now. They help teach the kids how to help each other and how to love one another. Everything on Nick is like that." Another had a similar feeling about PBS: "I like my kids to watch PBS because it's more of a learning thing instead of the cartoons. I have no problem with them watching PBS for two hours straight. They have all those good learning shows." But one mother of a 4-6 year-old from Columbus said she made a mistake thinking she could go by the brand alone: "I thought you could trust Cartoon Network because of the name. I just recently paid attention to what he was watching and saw it. I said, 'What the heck!' I couldn't believe it."

"Because of the rules that I have set forth he doesn't ask to watch things that he can't watch."

[Mother of a 4-6 year-old, Denver, Colorado]

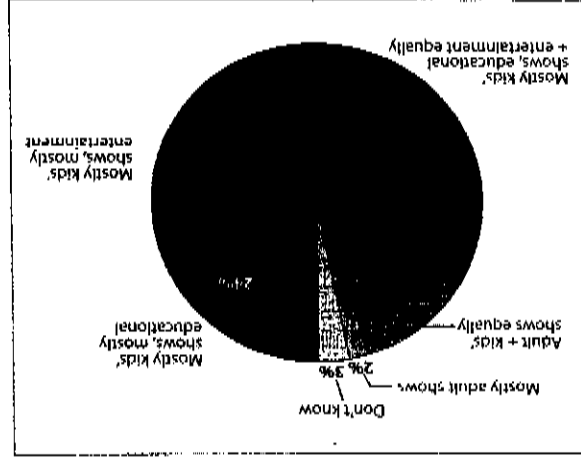
A number of parents in focus groups talked about the influence of their older siblings on what their younger kids see on TV or videos. The mother of one 1-3 year-old from Denver told about a time when her young son watched the movie *Alien vs. Predator*. "He liked it. . . . When I saw it I couldn't believe my older son let him watch it. I thought he would be up all night, but it didn't bother him at all." . . .

Children Under Age Two

Many experts consider the first two years of life especially critical for children's development and are particularly interested in monitoring media use patterns during this period. For example, the American Academy of Pediatrics has recommended no screen media use at all for children under two.

In fact, this study indicates that children under age 2 have quite different media habits than children 2 years and older, although it also indicates that they live media-rich lives. Almost all babies 6-23 months old have listened to music (98%), or been read to (94%). Nearly eight in ten (79%) have watched TV, and two-thirds (65%) have watched videos or DVDs. Only a very few have ever used a computer (5%) or played any kind of video game (3%).

More than four in ten (43%) children this age watch TV every day, while another 17% watch several times a week. Nearly one in five (18%) watch videos or DVDs every day, while another 26% watch at least several times a week. In a typical day, 61% of children this age watch TV, a video, or



Note: Among those who watch TV at least several times a month.

Figure 4 Percent of Children Who Watch . . .

(24%) than say their child watches mostly entertainment shows (10%), but a plurality (48%) say their child watches both types of shows about equally. "A show can seem fine one minute, and in the next minute Tom pulls a gun on Jerry."

[Mother of a 4-6 year-old, Denver, Colorado]

In focus groups, a number of parents indicated that their young children watch mature content and that both the child and the parent seem fine with that. For example, the mother of one 4-year-old from Denver said, "The *Funisher*, my son loves that movie. He's more mature." Another said she "goes by her child's personality" in deciding what he can or can't watch. "Not a lot of people would be comfortable with a 4-year-old watching medical shows where they show people coming in and bleeding and crying," she said. "Obviously it is a tragedy. But he really loves the human body." Another mom from Irvine said, "I try not to really shelter my daughter. . . . She's two. She wants to watch *Jurassic Park*. . . . [There's a dinosaur [that] ate a guy—that's what dinosaurs do—they eat people and animals. She understands that. She doesn't get freaked about it. She even watched *Chuckie* the other day. She thought it was funny."

a DVD), for an average of one hour and nineteen minutes. Most parents say they are in the same room with their child while they're watching TV either all or most of the time (88% of those whose children this age watch TV in a typical day).

Around four in ten children under two can turn on the TV by themselves (38%) and change channels with the remote (40%). Almost one in five (19%) have a TV in their bedroom. A quarter (26%) of parents report that their children this age have already imitated a positive behavior from a TV show, like sharing or helping. Among the 63% of children this age who watch at least several times a month or more, 35% watch mostly kids' educational shows, 40% watch a mix of kids' educational and entertainment shows, and 19% watch a mix of programming for both children and adults.

In addition to watching their own shows, babies this age are also exposed to "background" television. A third (33%) live in homes where the TV is on most or all of the time, whether anyone is watching or not. Seventy percent of parents with children under two say they watch their own TV shows in a typical day, for an average of an hour and forty-three minutes, including 32% who say their child was in the room with them all or most of the time, 17% who say half or less of the time, and 20% who say none of the time.

More than half (58%) of children under two are read to every day, with another 25% being read to several times a week. In any given day, 77% are read to, for an average of 44 minutes. . . .

Percent of Children Under Age Two Who Watch TV . . .

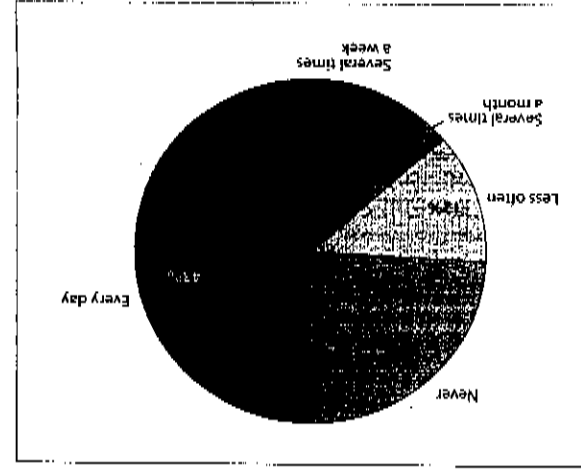


Figure 5

Summary and Conclusions

The Role of Parents

In the public debate about children and media, people on all sides of the issue often end up pointing to the role of parents in monitoring their children's media use, encouraging them to push the "off" button. This study provides important documentation of just how powerful a role parents have in shaping their children's media habits. A third of children live in homes where parents simply leave the TV on most of the day, whether anyone is watching or not—and, not surprisingly, those children end up watching significantly more than other kids do. Many parents spend a fair amount of time watching TV or on the computer themselves, and again, children of those parents also spend more time watching a screen each day. And a third of children 6 years and under have been allowed to have a TV in their bedroom—mostly to avoid conflicts with parents or other family members' viewing—and again, those children spend more time watching TV.

Why Parents Are Drawn to Media

Many parents find media a tremendous benefit in parenting and can't imagine how they'd get through the day without it (especially TV, videos, and DVDs). Media allow parents a chance to get their chores done, quiet their kids down, or just have some "me" time, knowing that their kids are "safe"—not playing outside, and less likely to be making trouble around the house. Multiple TV sets, DVD players, and computers help solve sibling quarrels and also let parents get their own screen time uninterrupted. While fewer than four in ten (38%) parents say they think TV mostly helps children's learning, parents are relieved that they can make use of media in these ways with less guilt, because of what they see as real advances in the educational quality of media content.

The Educational Value of Children's Television

While parents in the survey seem pretty evenly split on whether TV in general is mostly helpful (38%) or harmful (31%) to children's learning, in the focus groups almost all parents pointed to "learning" as one of the big positives of TV for their kids, and many made comments about observing their children learning things from TV shows. In general, parents in the focus groups seemed well satisfied with the quality of programming available to their kids. Most felt their children would learn just as well without TV, but didn't want the extra burden that would place on them as parents. The reigning sentiment seemed to be that there is simply no way they can live their lives and get everything done without TV and videos, and that the educational content and positive lessons in much of the programming lessens their guilt at not spending more time with their kids. And while parents in the survey indicate that they think the computer is more educational than is TV, the focus groups revealed that many parents greatly prefer TV or videos because they require less supervision (and because they're worried about their kids hurting the computer).

become a part of the fabric of family life, they are often consumed separately, used as much or more to keep the peace than to bring family members together. It is hoped that the data in this report will be used to help families assess their own media habits, to spur the development of media products that are beneficial to children and families, to inform policy debates about public broadcasting, digital media, and children's commercial exposure; and to provide the data to help inform future research about the impact of various media on young children. To date, there has been very little research about the impact of media on the youngest children, especially those 2 years and under. Given how much a part of children's lives these media are, it seems important to explore in greater depth the impact media may be having on their development.

Note

1. The percent of parents who report that their children watched videos or DVDs may be an underestimate due to the way the question was worded. The question read "Did your child spend anytime watching videos or DVDs, including while riding in the car?" In a previous survey, the question was asked without the phrase "including while riding in a car," and a far greater proportion of parents reported that their children had watched videos or DVDs (46%, compared to 32% in the current survey). Many respondents in the current survey may have misunderstood the question and answered "yes" *only* if their child watched videos or DVDs while riding in the car.



A Big Role for Media

Media, especially television, are clearly playing a key role in children's lives, starting at an early age. In a typical day, more than eight in ten (83%) children ages 6 months to 6 years old use screen media, averaging about two hours each (1:57). As mentioned above, a third live in homes where the TV is left on most or all of the time, whether anyone is watching or not, and a similar proportion (30%) have the TV on during most or all of their meals. Homes with multiple TV sets and portable media allow kids to watch in the privacy of their rooms, or when they're on the go—a third (33%) have a portable DVD player, and a third (33%) have a TV in their bedroom. About one in eight (12%) are put to bed with the TV on at least half the time.

Less Time with TV and DVDs

While there haven't been any major changes in children's daily media habits since a similar survey was conducted in 2003—they aren't more likely to use computers or video games, or less likely to watch TV—when children do watch TV or videos, they are spending less time doing so (10 minutes less watching TV, and 7 minutes less watching videos or DVDs). It's possible that this change follows on the slight—but statistically significant—drop in the proportion of parents nationally who say they leave the TV on all or most of the time (from 37% to 32%) or who say they usually eat meals in front of the TV (from 35% to 30%). It is also possible that the shift comes from a greater number of parents thinking TV mostly *hurts* children's learning (up from 27% to 31%). However, it is also possible that it is an artifact of a shift in the time of year the survey was conducted, from April and May to September, October, and November. Slight decreases in time spent with computers and playing video games were not statistically significant. We will continue to track these data over time.

American Academy of Pediatrics Recommendations

A substantial number of children are using media in excess of the amounts recommended by the American Academy of Pediatrics (AAP). In a typical day, nearly two-thirds (61%) of babies under two years old use screen media, and 43% of children this age watch TV every day (the AAP recommends no screen time for babies under two). And while the AAP recommends no more than 1-2 hours per day of screen media for children two and older, in a typical day 41% of 2-3 year-olds and 43% of 4-6 year-olds use screen media for 2 hours or more. Few parents report having spoken with their doctor about their child's media use. . . .

Electronic media have clearly become a central focus of many young children's lives, a key component in family routines such as working up, eating, relaxing, and falling asleep. Not only do children—starting when they are just babies—spend hours a day using media, but they are also learning to use the media by themselves, often watching their own TVs, DVD players or hand-held devices, many times in the privacy of their own rooms. As much as media have

Exposure

Because the national television rating services do not report results on children younger than 2 years of age, there are relatively few studies of very young children's exposure to television. Exposure to television, of course, consists of the total of foreground and background TV. The few studies that attempt to assess exposure do not distinguish between foreground and background TV but instead, ask parents how much television their children "watch" during some period of time, such as a typical day or week. It is not clear how parents interpret this question. They may include times the child are present with a TV set in use but not paying overt attention, or they may answer according to their estimate of the amount of television to which the children do apparently pay attention. This is highly relevant to estimates of exposure because at home, very young children initially pay little attention to most television programs but extend their attention to increasingly diverse content as they mature. Consequently the amount of television that is in the foreground increases with development.

Christakis, Zimmerman, DiGiuseppe, and McCarty reanalyzed data collected for a national longitudinal study during the 1980s. Parents were asked how much television their children watched during typical weekdays and weekends. Children aged 1½ years watched an average 2.2 hours a day, whereas children aged 3½ years watched 3.6 hours a day. The variability in the parent estimates from this study is enormous. About 42% of the 1½-year-olds watched no television (the modal viewing time), whereas a few parents described their children as watching upwards of 18 hours a day. Among the 3½-year-olds, in contrast, only about 10% were described as watching no television, and the modal viewing time shifted to about 2 hours a day. Certain and Kahn analyzed data from later cohorts of the same study as surveyed in the early and mid-1990s. They reported that of infants 0 to 11 months of age, 83% were reported as watching no TV, whereas among 12- to 23-month-olds, 52% watched no TV and 27% watched 1 to 2 hours a day, with the remainder watching greater amounts. Of children from 24 to 35 months of age, 21% watched no TV, 38% watched 1 to 2 hours a day, and the remainder watched greater amounts. It is important to note that average figures given for very young children's viewing times combine large percentages of children who do not watch any TV with substantial percentages of children who do watch. In that sense, the averages are quite misleading. In our view, all these numbers should be taken with a grain of salt insofar as it is likely that some parents included background television in their estimates, whereas others did not.

The introduction of baby videos such as the *Baby Einstein* series and TV series such as *Teletubbies* in the 1990s substantially increased the amount of foreground television available to very young children. To our knowledge, only two studies estimate very young children's exposure to television since and Brewer surveyed 100 parents on the amount of time that children aged 2 and younger are exposed to and attend to television and videos. In this study, parents of 100 infants, ranging in age from 2½ to 24 months, were asked to

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Television and Very Young Children

The American Academy of Pediatrics (AAP) has recommended that children younger than 24 months of age not be exposed to electronic screens. Practically speaking, *electronic screens* refers to television, although toddlers may increasingly become exposed to computers as software and interfaces are developed for them. At the time this recommendation was made, very little was known about toddlers' exposure to screens, use of screens, or the impact on them. Much of the recommendation was based on the known or presumed harmful effects of television on older children. The recommendation was thus highly conservative, pending new research. Because the recommendation was made, a number of research groups have begun to investigate television and very young children. This article summarizes and reviews that research, along with some older studies that have received little attention in this context. We subsequently revisit the AAP recommendation and make suggestions for future investigations.

Our review is organized in part on a distinction made by Anderson and Evans. In that largely speculative article, a contrast was made between *foreground* and *background* television. *Foreground* television is programming to which very young children overtly attend in a sustained manner. Ordinarily, foreground television consists of programming that is designed for young children and is presumably at least partially comprehensible to them. Background television consists of programming to which very young children pay little overt attention. Such programming is generally not produced for children and would be largely incomprehensible to them. The distinction between foreground and background television is relevant because foreground television could in principle be educational for very young children and have a positive impact in addition to or instead of the presumed negative impact. Such a possibility was not considered by the AAP. On the other hand, it is hard to imagine that background television could have a positive impact if it has an impact at all. In the remainder of this article, we examine research on very young children's exposure and attention to television, learning from foreground television, the effects of background television on behavior, and what is known about television's impact on development. We conclude with a discussion of areas for future research.

complete a diary tracking the infants' TV exposure. On average, parents reported that their infants were exposed to about 120 minutes of TV per day, 50% of which was infant and toddler programming, 49% adult programming, and 9% preteen programming. In addition, parents reported that the child attended to about 60 minutes of TV per day, or about half of their total exposure time.

The Kaiser Family Foundation commissioned a national survey of parents of children aged 6 months to 6 years. With the permission of Vicky Rideout of the Kaiser Family Foundation, we examined reported viewing for children in the survey, who were younger than 1 year of age and 1, 2, and 3 years of age. The percentages of children who did not watch TV on a typical day were 48%, 40%, 29%, and 21% for each age group, respectively. The corresponding percentages for videotapes and DVDs were 70%, 53%, 47%, and 49%. For those who did watch TV, the average daily times spent watching were 1 hour 8 minutes, 1 hour 26 minutes, 1 hour 35 minutes, and 1 hour 29 minutes, respectively. The average daily times spent with videotapes or DVDs for those who watched them were 1 hour 16 minutes, 1 hour 27 minutes, 1 hour 39 minutes, and 1 hour 29 minutes, respectively. It is interesting to compare the numbers with those reported by parents surveyed in the early 1990s. For children younger than 1 year of age, the nonviewers dropped from 83% to 48% 10 years later; for 1-year-olds, the nonviewers dropped from 52% to 40%. It is clear that a much larger percentage of babies are watching TV and videos now. However, times spent viewing TV and videos have actually decreased if the numbers reported by Christakis et al. are used as a baseline against which to compare the recent data. We expected that with the advent of baby videos and TV series, parents would have reported more, not less, time spent viewing TV.

If the above numbers primarily represent foreground television viewing (but we do not really know), what can we say about exposure to background television? American homes have a television set in use about 6 hours a day, on the average, and Rideout et al. reported that 40% of parents with young children characterized a TV as being on "most" or "all" of the time. In addition, Picoutsakos et al. estimated that about half of exposure is to TV not made for young children. We have not been able to find more specific numbers, but presumably, a large percentage of America's very young children are exposed to many hours of background television as their parents or other older family members watch their programs or as the TV is simply left on all day with no one watching. . . . As we will argue below, foreground and background television are likely to have distinctly different impacts and should be clearly distinguished in future research with very young children.

Comprehension and Learning

Even if very young children are sensitive to the comprehensibility of TV programs, it is another question as to whether they can or do learn anything from them. The totality of results thus far suggests that very young children

learn less from television than from equivalent real-life experiences. We refer to this as the *video deficit*.

One line of experiments focuses on imitation. In the typical experiment, a child is shown either a live or video version of an experimenter engaged in demonstrating the functioning of a puppet. The demonstrated functions could be simple one-step operations, such as removing a mitten, or they could be more complicated operations, such as removing a mitten, shaking it to demonstrate a bell inside the mitten, and then removing the bell. Even after a 24-hour delay, 12- to 15-month-olds have little difficulty imitating the live demonstrations, but they are quite poor at imitating the video demonstrations, showing some success only with the one-step demonstrations. When this procedure was extended to children as old as 30 months, the imitations were still poorer when based on video. Only when children received six repetitions of the video did imitation performance become as good as a single live demonstration. Of considerable interest, Muentener et al. found imitation from video with six repetitions in infants as young as 6 months of age. Note that the above experiments compared live demonstrations with video that was as comparable to the live demonstrations as possible. If standard techniques of television production (editing, zoom shots, sound effects) are applied to the demonstrations, then performance does improve.

A second line of research uses variations on an object retrieval task. Children are shown a toy being hidden in an adjacent room and then are asked to go into that room and retrieve the toy. In the typical study, one group watches through a window as the toy is being hidden and another group watches the hiding event on video. If they saw the hiding event while watching through a window, 24-month-olds correctly retrieved the toy without searching multiple locations. If they saw the hiding event on TV, however, their performance was very poor. On either task, 3-year-olds did well, 2½-year-olds did well with video in one study and at an intermediate level in another. It is not known why 2-year-olds do so poorly when the hiding information is presented by video. The problem is not due to the three-dimensional nature of the search task, as was hypothesized by Schmitt and Anderson, Evans, Crawley, and Anderson found the video deficit even when the search space was a 2-dimensional felt board. The problem is also not due to the visual nature of the task. In their second experiment, Evans, Crawley, et al. simply told the children where the toy was hidden. If a real person told where the toy was hidden the children successfully retrieved it. If the same person, via closed-circuit TV, told where the toy was hidden, the children were not able to retrieve it.

Difficulty with the video toy retrieval problem experienced by 2-year-olds is not a consequence of absorbing no information from TV whatsoever. Their performance was substantially better on the first than later search trials, indicating that they did remember something from TV at least on the first trial. Once they had the experience of actually finding the toy in a particular location in the room, however, that experience appears to have overwhelmed any information provided by television. After the first trial, the children would generally search for the toy where it had been hidden the previous trial (known as the perseverative error). In light of the findings that this problem

did not exist if they viewed through a window (or were told by a real person) where the toy was hidden, it appears that they found something deeply unconvincing about information provided by TV as a basis for guiding their behavior. It is interesting that if 2-year-olds are given extensive experience with closed-circuit video, frequently seeing themselves live on TV during a 2-week period, they are then able to perform correctly on the toy retrieval task. This indicates that by 24 months, the video deficit may be overcome by relevant experience, suggesting that the video deficit is not necessarily a consequence of fundamental and biologically based cognitive immaturity.

A third line of research is concerned with language learning. Children 2 years and older can clearly learn vocabulary from television. Nevertheless, when comparisons are made between video and equivalent live conditions in children younger than 2½ years, the results suggest a video deficit. Grela, Lin, and Krcmar tried to teach object labels either live, in an equivalent video, or in live as compared to video conditions. Learning from video by children near their 2nd birthday was substantially better than by younger children.

Infants are able to perceive many phonetic contrasts that are not found in their native language; this ability is lost by about 12 months of age if infants are not exposed to other languages. Kuhl, Tsao, and Liu exposed American infants to contrasts found in Mandarin. One group of infants was exposed to 10 months of age. Other groups were exposed to equivalent audiovisual or audio-only DVDs. The infants exposed to live speakers did not experience the loss of ability to perceive Mandarin contrasts. Infants exposed to the DVD stimuli, however, showed the same loss as infants exposed to no Mandarin at all. Again, this research indicates a profound video (and audio) deficit.

Finally, one experiment represents a fourth line of research. Mummie and Fernald were interested in whether infants could learn emotional responses from video. They exposed 10- and 12-month-old infants to videos in which an actress was portrayed as looking at a novel object with a positive facial expression and talking about the object with a positive tone of voice. The actress looked at other objects fearfully and with a fearful tone of voice. Subsequently, the infants were presented with the objects. The main result was that 12-month-olds avoided the "fearful" object but did not show increased approach behavior to the positive object. The 10-month-olds showed no avoidance of the fearful object or increased approach to the positive object. Thus, only in one of the four conditions did infants show emotional learning from video.

Although the experimental studies are still few, they are remarkably consistent in indicating a video deficit for children 24 months and younger. Although there is some learning indicated by some of the studies, the learning is dramatically less than that found for equivalent live displays. . . .

Impact of Television

Thus far, the research indicates that there is growing use of television by very young children, and that they pay attention to programs made for them.

Children are sensitive to comprehensibility as young as 18 months of age, but there is a video deficit in learning from television insofar as learning is substantially less from video compared to equivalent live displays. In addition, background television disrupts play and interactions with parents. With these findings in mind, we now consider the small literature on the impact of television on very young children.

Language

In a case study reviewed by Naigles and Mayeux, Sachs, Bard, and Johnson analyzed the speech of a 3-year-old boy with deaf parents whose only exposure to spoken English was via television. Although this boy had clearly acquired vocabulary, his grammar was seriously dysfunctional, suggesting that he had acquired little if any grammar from exposure to television. Although the boy had acquired vocabulary, it is not known how much, if any, was acquired before the age of 2 years.

Although not the primary goal, a study by Nelson assesses the impact of foreground television in a larger investigation of language development during the 2nd year of life. Nelson found that the amount of time children watched television (primarily *Sesame Street*, as reported by mothers) was negatively associated with several measures of language development, such as the rate at which children acquired words, and developmental markers, such as the age when 50 words had been acquired.

Recently, Libenbarger and Walker analyzed vocabulary and expressive language in 30-month-olds in relation to TV viewing logs kept by parents starting at 6 months of age. Unlike other studies, this one analyzes outcome in relation to the particular programs to which the children were exposed. Programs associated with enhanced language growth were *Dora the Explorer*, *Blue's Clues*, *Dragon Tales*, *Arthur*, and *Clifford*. Programs associated with reduced language growth were *Sesame Street* and *Teletubbies*. *Barney and Friends* was associated with reduced vocabulary but increased expressive language. Total viewing, including adult programming, was associated with reduced vocabulary but slightly increased expressive language. This is provocative research indicating that early television viewing may have both positive and negative impacts on language development, depending on content. Alternatively, the associations may be due to selection effects with slower language learners being drawn to different programs than faster language learners.

It is interesting to note that two studies find negative associations of language development and viewing *Sesame Street* younger than the age of 2 years. This stands in contrast to consistent findings of increased language development associated with viewing of *Sesame Street* by older children. The producers of *Sesame Street* have always considered their target audience to be children 2 years and older. It may be that by being too advanced for children younger than 2, the program actually hinders rather than helps language development in such young children.

Symptoms of Attention Disorders

In a reanalysis of data collected in a longitudinal study during the 1980s, Christakis et al. examined the associations between early TV viewing and later symptoms of attention disorders. Time spent TV viewing (without reference to content) was assessed from parent estimates when the children were 1½ and 3½ years of age. Symptoms of attention disorders were assessed at age 7 years from five questions asked of the parents. For example, the parent was asked if the child had trouble concentrating, with the possible answers being never, some of the time, or all of the time. The researchers considered a symptom as being present if the parent answered sometimes or all of the time to the question. The symptoms were summed so that a child would receive a score from 0 to 5. Children in the upper 10% of the resulting distribution were considered as having symptoms of attention disorders. After statistically controlling for a large array of parent, child, and home factors, the researchers reported a small positive association (an odds ratio of 1.09) between viewing at age 1½ years and having symptoms of attention disorders. They repeated the analysis for 3½-year-old viewing and found the same small association. Not taking advantage of the longitudinal nature of the data, they did not control for 1½-year-old viewing to assess the 3½-year-old association or the reverse. It would have been very useful to know whether the 3½-year-old viewing accounted for variance additional to that accounted by 1½-year-old viewing or whether the association is established by 1½ years and does not change thereafter. It should also be noted that the viewing data were collected in the 1980s when there were no TV programs directed at children younger than 2. As with any correlational study, the Christakis et al. findings are open to alternative interpretations. Although it is possible that early TV viewing causes later symptoms of attention disorders, it is also possible that children with attention disorders are selectively drawn to early TV viewing. It could also be that the children, who may be hyperactive, are more likely to calm down when with TV; their parents may therefore encourage TV viewing. This latter interpretation is consistent with findings reported by Perroutsakos et al. that 70% of parents say their infant is less fussy when watching TV, and 55% say their infant becomes more focused when watching TV.

Cognitive Development

In a series of studies, Wachs examined the effects of background noise and household chaos on development of infants and toddlers. He identified background television as an important component of background noise. He reported that background noise is associated with poorer cognitive development. Carew conducted a longitudinal study of the impact of six "intellectual sources" on spatial and language skills related to intelligence. These skills were assessed by means of items taken from standardized tests. The six sources varied to the extent that the child was active in constructing his or her own experience, ranging from active construction during solitary play to shared construction during interactions with others and finally, to passive

Summary and Conclusions

construction during television viewing. Participants were 23 children who were observed in their homes at several points between the ages of 12 and 33 months. Associations were consistent with the hypothesis that television had a negative impact on cognitive development during the first 2 years of life. However, from about 24 months and older, the impact of television became positive and the associations were stronger. The Carew study did not distinguish between types of content to which the children were exposed, but given the era, the foreground programs were most likely *Sesame Street*, *Mister Rogers' Neighborhood*, *Captain Kangaroo*, and *Komper Room School*. A study by von Stauffenberg and Campbell assesses the relationship between TV viewing and quality of child care in a subsample from a larger study by the National Institute of Child Health and Human Development in which participants were families with children born in 1991. Data were collected when the children were approximately 36 months of age. Results indicate that children who were cared for in their own homes watched the most TV, those in family day care watched an intermediate amount, and those in day care centers watched the least. In addition, greater TV viewing was associated with poorer cognitive outcomes for children cared for in their homes by a nonmaternal caregiver but not for those in family day care or day care centers. It should be noted that this study does not differentiate between foreground and background television exposure. It may be that children in more formal day care settings were presented with programming designed for them, whereas those at home were exposed to both foreground and background television.

The research indicates that very young children are much more likely to watch TV than they did in the past. Given that children watch, it is unclear whether time spent viewing has changed. They pay attention to video that is made for them, and their patterns of attention are remarkably similar to those of older children and adults. They are sensitive to the sequential and linguistic comprehensibility of video at least as young as 18 months of age. That said, the evidence so far indicates a video deficit when it comes to learning. There is less learning from a video display as compared to an equivalent live display. This is not to say that no learning occurs. With sufficient repetition, learning from video can match learning from a live display. With respect to impact, one study finds positive associations of vocabulary growth with viewing particular children's TV programs and negative associations with other programs. Other studies find negative associations of viewing before age 2 with language, cognitive, and attentional development. Associations become

will only be magnified. On the other hand, as foreground television, it is possible that these new technologies will enhance learning. Finally, and most important, prospective longitudinal studies and intervention experiments should be undertaken. Such experiments should, among other things, compare the AAP recommended "best practice" of no exposure to screens with current standard exposure to television. Although we have hints that television may be having a negative impact on children younger than 2 years old, the evidence is still weak and open to alternative explanations. As a society, we are engaged in a vast and uncontrolled experiment with our infants and toddlers, plunging them into home environments that are saturated with electronic media. We should try to understand what we are doing and what are the consequences.



positive after age 2 when educational programs are viewed. Background adult television is a disruptive influence both on children's play and on parent-child interactions.

At the time of this writing, the AAP guideline, adopted without the guidance of almost any relevant research, appears to have been prescient. With the exception of the Linebarger and Walker findings, there is very little evidence that children younger than 2 learn anything useful from television. The evidence indicates that learning from television by very young children is poor and that exposure to television is associated with relatively poor outcomes. For example, two studies find that viewing of *Sesame Street* by children younger than 2 is associated with poorer language development, notwithstanding that research with older children finds valuable learning and long-term positive outcomes.

With the caveat that the total amount of research is still small, it appears that for children younger than 2 years of age, television has a different impact than it does for older children. Not yet addressed are the reasons why. One possibility is that television, although substantially iconic in its representation, is nevertheless a symbolic medium. For example, when we see a shot of a building followed by a cut to an interior room shot, we infer that the room is inside of the building. This inference is based on experience with the medium so that we understand that the juxtaposition of shots symbolizes the containment relationship between the room and the building. Children younger than 2, on the other hand, have been widely characterized as functioning in a sensorimotor manner with symbolic understanding quite limited. It may be that television in its present form is difficult for children younger than 2 to comprehend, even though they are, to some extent, sensitive to the canonical order of shots in a program such as *Teletubbies*. There are, of course, other possibilities than a lack of symbolic awareness, including immature perceptual, linguistic, attentional, and other cognitive skills. Whatever the case, by about age 2½ years, understanding of television appears to improve significantly, and the evidence for a positive impact of educational television is clear. What is also clear is that additional research is needed. First, it is important to try to understand the reasons why there is so little apparent learning from video. A useful line of research would be to experimentally develop videos for very young children that are designed to maximize learning of a specified type, for example vocabulary. With systematic experimentation, it might be possible to develop more effective educational videos than currently exist. After all, with substantial repetition, Barr et al. have shown that infants as young as 6 months of age can show imitation learning from video. Such research may help clarify the problems with video while at the same time providing guidelines for educationally successful video production. Second, it is important to begin to assess the impact of new video technologies as they are entering American homes. We found substantial disruptive effects of background TV using a 19-inch standard National Television Standards Committee monaural TV set. Many American homes are acquiring "home theaters" incorporating large-format high-definition screens with surround sound. It seems likely that the disruptive effects of background TV