

Wired Kids

How Technology Impacts Early Child Development

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The Power of Play in the Development of Young Children

The ABCs of Early Intervention: Best Practice Guidelines Under Part C of IDEA

Sensory for the SLP (and other early childhood professionals)

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Speaker Disclosure

Financial Disclosure: Cari Ebert owns Summit Speech Therapy, LLC (dba Cari Ebert Seminars) and receives a salary. She receives royalties from cariebertseminars.com product sales. Ms. Ebert also receives compensation for presenting this course.

Nonfinancial Disclosure: Cari Ebert has a son with autism and apraxia and shares personal experiences in her seminars.

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Why are we here today?

- Today we will examine the evidence to guide us as we live and work in the “Digital Age”
- Screen technologies are changing the landscape of play and thus changing childhood
- By the end of the seminar hopefully you will no longer think of technology as being inherently good or bad, but rather view it as a tool that can serve a purpose for children of a certain age when quantity, quality & context are thoughtfully controlled
- This is not a black and white issue – but rather many shades of gray

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Learning Outcomes

1. List 5 ways technology changes the landscape of play
2. Describe how screen time can impact sleep, attention and language development
3. Determine what makes media “educational”
4. Examine the effects of technology on social-emotional development
5. Summarize evidence-based recommendations for coaching families and caregivers on developmentally appropriate uses of technology
6. Apply evidence-based recommendations for using technology in therapy and early childhood classrooms

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Why is Technology So Appealing? And is it Addictive?

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Why Technology is So Appealing

- Devices are portable - can use them anywhere
- Handheld, lightweight & durable
- Cross-generational use; increases societal acceptance
- World is available at your fingertips
- Instant connectivity/instant gratification
- Touch screen/Easy to use (even babies can swipe an iPad)
- Visually enticing - quality of the screens & rich colors
- Multi-purpose (used for entertainment, learning, work)
- Technology provides "solutions" for parents of children with special needs

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Societal Pressures

- Strong pressure to make your child smarter, faster
- Parents will often spend more money on a high-tech toy because the assumption is that high-tech = educational
- Important point to explain to parents: technological know-how is one form of intelligence, but there are many other skills and knowledge children need including gross and fine motor, social-emotional, problem solving, communication and self-help

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Rise in Screen Time

- For all of these reasons, there has been a substantial rise in screen time, even for young children
- As pediatric therapists and educators, we need to consider what impact screen time is having on young children with developing brains and bodies - and then we must consider specifically the children we work with who have special needs

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Stats from Commercial Free Childhood.org & the American Academy of Pediatrics

- By age 3 months, 40% of infants are watching screen media regularly
- 29% of babies under age 1 are watching TV and videos for an average of 90 minutes per day & 23% have a TV in their bedroom
- 64% of toddlers age 1-2 watch TV and videos over 2 hours per day & 36% have a TV in their bedroom
- Screen time can undermine learning for babies and young children

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- 56% of parents of young children believe that baby videos are beneficial for development
- In 2011 there were 3 million downloads just of Fisher Price apps for infants and toddlers
- 1 in 3 kids are using tablets or smartphones before they can talk, preschool age children spend an average of 4 hours per day using screen media, 8-10 year olds spend nearly 8 hours a day with screen media while teens spend more than 11 hours per day
- Screen time can negatively impact a child's sleep

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- Excessive screen time for older children can increase risk of hyperactivity, emotional and behavioral problems, school performance, and social difficulties with peers
- TV watching is a factor in childhood obesity (for every hour of viewing, an additional 167 calories is consumed)
- Screen media exposure is highest among low-income families (those earning less than \$30,000/year), African-American, and Latino children
- Screen time can be habit forming

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Alliance for Childhood & The Campaign for a Commercial Free Childhood (2012)

- Early experiences shape the developing brain
- Repeated experiences strengthen neural connections, shaping a child's behavior, habits, values and responses to future experiences
- How young children spend their time in early childhood can have lifelong ramifications
- For better or worse, repeated behaviors such as watching TV, playing video games, and playing with apps, can become biologically compelled habits

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Is Technology Addictive?

- At the very least we know technology is something that people become dependent on.
- There is evidence that screen time can be habit-forming: the more time children spend in front of a screen as infants and toddlers, the harder time they have turning the screen off as they get older.
(Christakis & Zimmerman, 2006 & Certain & Kahn, 2002)
- According to research by Gentile in 2009, 1 in 11 children aged 8-18 are addicted to technology (never in human history have there been childhood addictions)

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Addictive Nature of Technology

- The DSM-V was released in May 2013 & contains a new diagnosis: *Internet Use Disorder* – it is listed in the appendix as a condition that needs further study
- The DSM-V describes this disorder as *internet overuse or excessive computer use that interferes with daily life*
- What most parents/educators/therapists can attest to is that technology seems to have a powerful pull on us all – even very young children

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Electronic Screen Syndrome Dr. Victoria Dunckley, M.D.

- Another term used to describe the mental health woes caused by excessive screen time – “wired & tired”
- Screen time shifts the nervous system into fight-or-flight mode which can lead to dysregulation (screen time can cause a child to become overstimulated)
- Dysregulation – the inability to modulate one's mood, attention or level of arousal in a manner appropriate to the situation

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Technology: Is it making addicts of us all?

“Research shows that constant use of these devices is actually rewiring the physical structure of people's brains. Every time your phone, tablet, or computer pings with a new text, tweet, or email, it triggers a sense of expectation, and the reward centers in your brain receive a pleasurable squirt of dopamine. Over time, a brain habituated to these quick fixes shrinks the structures used for concentration, empathy, and impulse control, while growing new neurons receptive to speedy processing and instant gratification. Brain scans of Internet addicts...can resemble those of cocaine addicts and alcoholics.”

-excerpt taken from THE WEEK, August 10, 2012, page 4

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Too Much Screen Time Can Damage the Brain

“Taken together, studies show that internet addiction is associated with structural and functional changes in brain regions involving emotional processing, executive attention, decision making, and cognitive control.”

Lin & Zhou et al, 2012

Studies have shown atrophy (loss of tissue volume) in gray matter areas – specifically in the frontal lobe, which governs executive functions such as planning, prioritizing, organizing and impulse control.

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New Powerful Evidence...

[Glow Kids: How Screen Addiction is Hijacking our Kids – and How to Break the Trance](#) by Nicholas Kardaras, Ph.D.
Published in 2016

In this book Dr. Kardaras, an addiction expert, explains how kids get addicted to technology. He likens screen time to “digital heroin” and advises us adults to prevent 4 year olds from getting hooked on screens by choosing Legos over Minecraft; books over iPads; nature over TV. He goes on to say that healthy development requires social interaction, creative play and engagement with the real world. Too much technology can dampen and stunt development.

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Effects of Too Much Technology

- Many parents report that while their child is in front of the screen, life is good. But the rest of the day is often made more difficult as the child comes down from a “screen high.”
- Excessive screen time can create a hyper-aroused nervous system and is referred to as “Electronic Screen Syndrome.”
- Screen time creates changes in brain chemistry, most notably in the release of dopamine (a neurotransmitter often called the *pleasure chemical*). “The technology is rewiring our brains.” -Dr. Volkow, Director, Ntl Institute of Drug Abuse

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“When every finger swipe brings about a response of colors and shapes and sounds, a child’s brain responds gleefully with the neurotransmitter dopamine, the key component in our reward system that is associated with feelings of pleasure. Dopamine hits in the brain can feel almost addictive, and when a child gets too used to an immediate stimuli response, he will learn to always prefer smartphone-style interaction—that is, immediate gratification and response—over real-world connection.”

Liraz Margalit, Ph.D.

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Effects of Too Much Technology

- Instant gratification is a major component of technology
- From a very young age children are being wired to demand instant which means they aren’t wait
- Waiting is a life skill – when we wonder why kids can’t sit still in a restaurant or in circle time we must consider that we have wired kids to not be able to wait or delay gratification

learn



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Finding a Balance

- We live in the digital age and technology is here to stay – so we need to identify how & when it can be beneficial and how & when it can be detrimental to the development of children.
- As pediatric professionals, we need to be good stewards of the technology tool and neither abuse it nor completely dismiss its value.
- Finding a balance is key!

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Finding a Balance

- Technology can be used occasionally as one of many tools to enhance development, but it should never be allowed to replace basic play skills in young children.
- Technology should not be used as a way to pacify young children in lieu of direct interactions and experiences with parents and caregivers. If the screen is used primarily as a babysitter, then it is not likely enhancing development.

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The Virtual Playground

Instead of playing on the traditional playground, children today are often playing on the virtual playground, thus experiencing the world differently

Direct vs. Indirect contact with the world
Authentic vs. Contrived experiences
The natural world vs. The cyber world
Interactions with real people vs. Interactions with simulated characters
Actual vs. Pretend consequences
3D vs. 2D

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Active Play vs. Passive Entertainment

- Active Play: An activity that is fun, entertaining or amusing in which the child takes a participatory role (*occurs on the traditional playground*)
- Passive Entertainment: An activity that is fun, entertaining or amusing in which the child watches as something interesting happens (*occurs on the virtual playground*)
Active play = whole body learning
Passive entertainment = sedentary

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High-Tech is Easier

- One aspect of human nature is that passive activities will drive out active ones – all other things being equal, doing something easy is preferable to doing something difficult. (Winn, 2002)
- After playing with a passive, high-tech toy, the interest in playing with a toy that requires active participation and imagination starts to diminish.
- A child with a lot of passive play experiences may consider active play to be too much work - riding a bike or playing tag may seem too effort-demanding after playing on the iPad.

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High-Tech is Easier

- Let's consider kids we work with who are dysregulated...
- Kids who under-respond to sensory input tend to prefer sedentary activities
- Occupational Therapists tell us that these kids need alerting activities to "get their engine running"
- So, if we allow the child with low registration (under-responsivity) to dictate the play, it is likely he or she will choose screen-based play over active play

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The Lure of Technology:

When given a choice between screen play and non-screen play, which one will the child usually choose?



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Screen Time Reduces Play Opportunities

- Young children who spend a lot of time in front of a screen may not have had as many creative play experiences with toys or with dramatic play
- Therefore these children may play in simplistic and repetitive ways due to a lack of experiences
- These kids will likely have to be shown *how* to engage in more productive, higher levels of play

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Traditional Playground

- Sensory rich
- Active play
- Encourages social interaction
- Child-directed
- Based on imagination
- Play is flexible
- Teaches kids to deal with real life situations
- Enhances development across 5 domains

Virtual Playground

- Sensory deprived
- Passive, sedentary
- Encourages independent play
- Designed by an adult
- Based on rules/expectations
- Pre-determined/not flexible
- Teaches kids to turn it off/walk away when frustrated
- Often force feeds academics

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5 Developmental Domains

1. Cognitive
2. Communication
3. Social-Emotional
4. Physical
5. Adaptive/Self-Help

In education, there is a heavy emphasis on cognitive development
To educate a child requires us to educate the **WHOLE** child

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- The traditional playground: children are free to learn through play that is relevant and meaningful to their life
- The virtual playground: children are being force-fed academics, often before it's developmentally appropriate

It seems as though childhood has become a race to see how rapidly our toddlers can learn their letters, numbers, shapes and colors...as if these were the most important things in life

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First Words...Quality Matters

- Social Words
- Power Words
- Concept Words

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Early Brain Development

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Many infants & toddlers are in front of a screen before they can talk, walk or use a spoon, so we must ask...

- What is the impact of screen time on the developing brain?
- What would young children would be doing if they weren't in front of a screen?
- Is the young child benefiting from what's on the screen or is it serving as an electronic babysitter?

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Early Brain Development

- Babies are born with 100 billion neurons. Prior to age 3 the job of the young brain is to establish and reinforce connections between neurons. These connections form synapses.
- Synaptic connections are created at a rapid rate through age 3. With these connections, information is passed from one nerve cell to another and learning occurs.
- By age 3, 85% of the core structures of the brain are formed.

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- What shapes how the young brain is formed?
 1. Early experiences shape how the brain is formed – kind of like wet cement
 2. However, the absence of experiences will also influence brain development
 3. Genetics also influence how the brain develops

- "Brain development reflects the coaction of nature and nurture." Neurons to Neighborhoods, p. 53

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- This means that early childhood experiences can have important, lifelong ramifications. For better or worse, repeated behaviors strengthen synaptic connections and transform the repeated activity into habit.
- Habit can then lock the child into rigid behaviors. Once the brain has wired new circuitry, the child longs to keep repeating it, in order to keep the chemically triggered synapses activated.
- Routine activities/habits are then carried out more quickly and efficiently while unused neural connections are pruned away.

Carr, 2010 p. 34; Doidge, 2007 p. 317

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AAP Recommendation

American Academy of Pediatrics came out with a precautionary position statement in 1999: *"Pediatricians should urge parents to avoid television viewing for children under the age of 2."*

- Question: Why did the AAP make this recommendation about television viewing in 1999 before there was any research to support it?
- Answer: Because they looked at early brain development and concluded that children under age 2 have a critical need for direct interactions with parents and caregivers to maximize healthy brain growth and the development of cognitive, social emotional and language skills.

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Nobody Listened

- AAP's 1999 recommendation discouraged screen time under age 2, yet nobody seemed to listen.
- A nationwide study conducted by the Kaiser Family Foundation in 2005 found that at that time more than 60% of parents allowed their young children, ages 6 to 23 months, to watch TV or videos each day.
- In 2011 the AAP provided these stats: 90% of parents report that their children under age 2 watch some form of electronic media. By age 3, one-third of children have a TV in their bedroom.

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AAP's Position in 2011

- In 2011 the American Academy of Pediatrics reaffirmed their position from 1999 in a statement discouraging screen media exposure in children younger than age 2
- Recommendation for kids over age 2: Limit screen time to less than 2 hours per day
- There is now enough research to substantiate the AAP's recommendation...but it still seems as though nobody's listening

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What Technology/High-Tech Play is Displacing in Babies and Toddlers

- Face to face interactions with other people (less engagement)
- Less talking by caregiver (Sosa research)
- Movement: rolling, crawling, walking
- Manipulating and playing with toys
- Learning naturally through discovery and exploration of the environment
- Adult-child interactions with books

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The new screen technologies haven't displaced the older technologies of TV and videos – they have added to the amount of screen time for children

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Electronic Books (Parish-Morris et al. 2008)

- The so-called interactive, electronic books (e-books) in which screen images respond to touch with sound effects, words or movements are interfering with the back and forth conversations between caregiver & child
- The screen images and sound effects are less likely to induce adult-child interactions that promote literacy that traditional books do
- The added distractions associated with e-books have been linked to lower levels of story comprehension (focus is on random swiping instead of on the storyline)

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Concern with Electronic Books

- One key learning to learn behavior is for a child to be able to willingly look at books with adults as a way to interact and learn
- Once a child is exposed to electronic books, expecting to be entertained with bells and whistles, traditional books may not be exciting enough to get and maintain the child's attention

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Displacement Theory

- In February 2006 E. Vandewater published her research in *Pediatrics* that examined Displacement Theory.
- In her study, TV was shown to displace two things: the children's time spent with their parents in non-TV activities and their time spent in creative play.
- Creative pastimes such as coloring, playing with toys, making arts and crafts, pretend play & dress-up were reduced by 11% for each hour of TV viewed per day.
- Based on her findings, Vandewater concluded that the AAP was right to be concerned. Screen time negatively impacts child/parent time together and reduces creative playtime.

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How Technology Impacts Early Play Skills

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How Young Children Learn & Develop

- By practicing newly learned skills at different times and with different people while participating in naturally occurring routines and activities (in context)
- Through discovery and exploration, using all of their senses/whole body learning
- Through positive face-to-face social interactions with caregivers, siblings and peers
- Through hands-on play (doing, not by watching others do) – extensive evidence that movement enhances attention & learning (*Smart Moves* by Carla Hannaford)

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Young children learn best through play that is relevant and meaningful to their life; they do not learn best through direct instruction, drill work, or flash cards

Apps on the iPad for young children = animated flashcards! We are still teaching concepts out of CONTEXT!



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Declarative Knowledge (acquiring information/memorizing) vs. **Procedural Knowledge** (knowing what to do with the information/application)

Passing the written portion of driver's test is an example of declarative knowledge while passing the actual driving portion of the test is an example of procedural knowledge

Teaching young children with flashcards = teaching them _____ knowledge

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Learning & Play

- 3 prevailing beliefs about *learning & play*: children benefit most from educational toys; high-tech toys are important for young children; academics should be emphasized as early as possible.
- Definition of a toy: an object for children to play with
- Let's examine how the landscape of play with toys is changing as a result of technology.

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- The iPad, Chromebook or iPhone is a toy: a screen-based toy
- Toys are the tools for learning
- Screen-based toys are one type of toy for young children, but it can't be the ONLY type of toy that is played with
- Young children need help balancing play with physical activity, screen-based play, hands-on experiences, academics and quiet times for reflection

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No app or other screen media will be as effective as interactions with a live, responsive parent, therapist, teacher, sibling or playmate

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Does Play Matter?

- The word play is often used in a derogatory manner. *"Our speech therapist is really sweet, but all she does is just play with my child."*
- Many benefits of play. Through play, children discover, interact, absorb, experience, create, explore & learn.
- We must remind parents and caregivers that play experiences provide learning opportunities across all 5 developmental domains (cognitive, communication, social-emotional, physical & adaptive).

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The Right to Play

- The United Nations has declared play as a basic human right of all children in the world
- Yet, our media-saturated culture seems determined to squeeze play out of childhood
- Child-directed play is disappearing from our homes, neighborhoods, daycares, and schools
- Many adults view play as a waste of time; as frivolous, purposeless activity

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Defining *PLAY* in the context of early child development?

Necessary components of true **PLAY**

1. Play is child-directed
2. Play is the spontaneous activity of children
3. Play is intrinsically motivating
4. Play requires active involvement from the child
5. Play is fun

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The Changing Landscape of Play and Childhood

- What did you do for fun when you were a kid?
- What do kids do today for fun?
- Does childhood today look like your childhood did?

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Play in the 1970s

- Played outside
- Rode bikes
- Jump rope, hop-scotch, built forts, monkey bars
- Mud pies, sandbox, rolled down hills (down & dirty, sensory rich play)
- Ran through the sprinkler
- Kick-ball, hide-n-seek, tag
- “Be home by dark”
- Child directed free play
- Played with neighbors
- Freedom to discover & explore
- Risky play (climbed trees, sledding)
- Mr. Rogers, Electric Company and Saturday morning cartoons
- Indoor board games

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Play in the Digital Age

- Ride on Power Wheels
- Play on the Wii, X-Box, Play Station, iPad, iPhone, Nintendo DS
- Adult-directed enrichment activities
- Watch TV/DVDs/Netflix - available all day, every day
- Organized sports
- Clean, mess-free, sensory deprived play prevails
- Children prefer to play indoors and sedentary activities are most common
- Formal play groups
- Helicopter parents/lack of freedom/lack of risky play

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Lack of Risky Play

Peter Gray, Ellen Sandseter

- Today children are sheltered by helicopter parents in a helicopter society
- Children are no longer free to play or embrace risk
- There is a difference between risky play and hazardous play
- During risky play children learn about risk analysis – learning how to judge their own capacities – determining which risks they are ready to take (physically or emotionally)

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- During indoor play today, children tend to seek out passive activities
- Young children often desire to be entertained or instructed (superficial play) with noticeably less creative, dramatic and imaginative play occurring
- Children who want to be entertained or instructed often lack initiation – losing the ability to think for themselves – only doing what adults instruct them to do or what the electronic toy allows them to do
- Today play seems to be more about store bought toys or apps with a pre-determined set of responses – play used to be about DOING something: creating, exploring, pretending, imagining, building, making...

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Adult-Directed vs. Child Directed Play

- Adult directed play: adult plans the activity, initiates the activity and determines the ending point
- Child-directed play: adult follows the child's lead and scaffolds to enhance development
- As adults we must consider our role in fostering true play for the sake of child development – let's consider the difference between the following:
 - An activity
 - An opportunity

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Force Feeding Academics to Infants and Toddlers

- The commercialization of childhood is a sad & scary reality of today's society as the focus is on accelerating a young child's development through educational toys. “The baby-educating toy category is now a \$1 billion-a-year business.”
Hirsh-Pasek & Golinkoff
- Our youngest children are often a direct target for marketing ploys. For example, *Baby Einstein*, & *Brainy Baby* educational videos and *Your Baby Can Read!* program. “Give your child the intellectual edge” is what these products say to parents.

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Memorizing vs. True Learning

- True learning occurs in context
- “Your Baby Can Read” program teaches babies to memorize, not read
- By raising child in a print-rich environment he will learn basic phonemic awareness skills that will facilitate development of pre-literacy skills
- There is no credible evidence that babies and toddlers learn anything useful from screens – except to recognize and become attached to commercialized characters - Commercial Free Childhood.org

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Beware...

- In 2012 the Infant Learning Company was accused of false marketing and the founder, Robert Titzer, was fined \$186.4 million
- The Infant Learning Company is now marketing the product in a different manner and it is called
Your Baby Can Learn!
- Program is based on pseudoscience and is continuing to put babies and toddlers at risk

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Battery Operated Toys

- Before we delve into digital technology, let’s first take a look at the simplest form of technology affecting children during playtime: battery-operated toys
- Battery-operated toys were first released in the 1940’s and they now dominate the toy industry
- Primary issue with battery operated toys: ***The more the toy does, the less the child does!*** We want the child to provide the **power**, the **imagination** & the **sounds effects** when playing with toys

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The High-Tech House & Barn

- Website for the “Happy Sounds Home” says: “*Great sound effects in different rooms to create a realistic feel!*”
- Website for the “Animal Sounds Farm” says: “*Tots will love to im“moo”tate their favorite animal friend sounds!*”
- **Questions we need to consider:** Does technology change the way the child plays with the toy? Does technology make the toy better? Does the high-tech toy enhance development or inhibit development?

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Benefits of Battery Operated Toys

1. Teaches the child about cause and effect
2. Captures the child’s attention with lights, sounds and other visual stimuli
3. Facilitates emergence of the distal point as child uses index finger to turn toy on, push buttons, and swipe
4. Provides an immediate reward when the button is pushed (lights, sound, music)
5. Teaches child to follow specific directions (adult directed)
6. May facilitate choice-making

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Drawbacks of Battery Operated Toys

1. Don’t promote interactions between people
2. Limit creativity and curiosity
3. Encourages kids to memorize rote skills out of context
4. Kids get stuck in the cause & effect stage of object play
5. Toy only works if the battery works
6. Designed with a specific age group in mind
7. More expensive than non-electronic toys

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8. Lack flexibility – toy can only be played with in one way
9. Force feeds academic concepts (more like work than play)
10. These toys tend to limit physical activity/encourage child to be sedentary
11. Battery operated toys keep children indoors
12. Contribute to inappropriate play/play often lacks purpose
13. Reward-driven

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Important Question

Not *“What does the toy do to entertain or teach the child?”*

But rather *“What can the child do with the toy?”*

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Benefits of Non-Electronic Toys

1. More flexible – can be played with in different ways
2. Encourage creativity and imagination
3. Promote physical activity
4. Most non-electronic toys can be played with outside
5. Better suited to facilitate interactions between people
6. They last longer
7. Not age specific

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8. Kids learn naturally through discovery and exploration
9. Cost less than electronic toys
10. Intrinsically motivating/not reward-driven
11. Enhance development without force-feeding academics
12. Learning occurs in context

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Drawbacks of Non-Electronic Toys

1. Child may have to be taught *how* to play with these toys in a purposeful way
2. Toys and pieces must remain together – when pieces get lost the toy loses its play value
3. Positive reinforcement must come from parents/caregivers or the child himself *“I did it!”*
4. The lure of high-tech toys is omnipresent and often too powerful for kids and parents to overcome (side by side the electronic toy will almost always be chosen over the non-electronic toy)

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The Impact of Technology on Play Skills

Technology changes the landscape of play by directly impacting:

- how kids play
- where kids play
- when kids play
- who kids play with
- what kids play with



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Technology Changes *How* Kids Play

- When playing with electronic toys or devices, children are usually sitting down/limited physical activity – it is a sedentary activity
- The child is often silent when engaging with electronic toys or devices (if the toy provides all the power and the sounds, there isn't much left for the child to do)
- High-tech play involves a lot of *watching* and not a lot of *doing* – Passive Entertainment vs. Active Play

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Technology Changes *How* Kids Play

- When a child is actively engaged in an activity he is integrating his senses/whole body learning
- When a child is engaged in a passive activity he is observing as something interesting happens (seeing and hearing) - Toys with batteries and/or screens are passive activities
- Young children need to manipulate real objects, engage with real people and be actively involved in real life experiences – this is authentic, genuine play, (much different than virtual play)

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Developmentally, is high-tech play a suitable substitute for real play?

- Is doing a puzzle on a tablet/iPad providing the same developmental benefits as doing a real puzzle?
- Is coloring on the tablet/iPad providing the same developmental benefits as coloring with real crayons?
- Is bowling on the Wii providing the same developmental benefits as real bowling?

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Technology Changes *Where* Kids Play

- Proximity to others is changed due to electronics – the child may not even be in the same room as the rest of the family (the Wii may be hooked up in the basement for example or child may be watching TV in his bedroom)
- Because most high-tech devices are portable, this allows the child to play them anywhere (in bed, at the restaurant, in the grocery cart, in the car) – one has to wonder what kind of play technology is displacing

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It's a High-Tech World

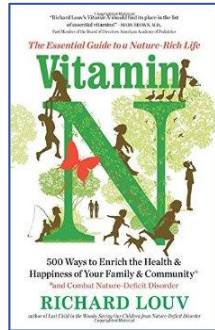
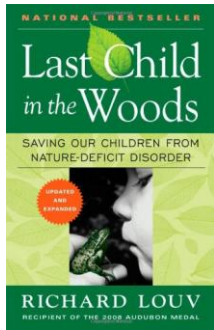
- iTods (toddlers living in the digital age)
- Screenagers (teens living in the digital age)
- "There's an app for that!"
- Digital Dementia (how many phone numbers do you actually know?)
- Nature-Deficit Disorder (term coined by Richard Louv)

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"Nature-Deficit Disorder"

- In an age of rapidly changing technology, it is alarming how many kids prefer to play indoors.
- Kids today (and many adults too) have an indirect relationship with nature because they are on the inside looking out and experiencing much of what nature has to offer virtually, on a screen.
- *Last Child in the Woods: Saving Our Children From Nature-Deficit Disorder and Vitamin N* by Richard Louv

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“Nature-Deficit Disorder” Richard Louv, 2008

“Nature-deficit disorder describes the human costs of alienation from nature, among them: diminished use of the senses, attention difficulties and higher rates of physical and emotional illnesses.” p. 36

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The most sensory rich place to play is _____

Screen-based play lacks:

- Whole body learning/bilateral/midline crossing
- Motor planning
- Gross motor
- Fine motor
- Interaction
- Exploring and organizing sensory information in the environment

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Technology Changes *Where* Kids Play Indoor Play = More Sedentary Lifestyle

- With advances in technology, we are adopting a more sedentary lifestyle. According to the CDC the number of overweight adults in the United States increased over 60% between 1991 and 2000. The population of overweight children between the ages of 2 and 5 increased by almost 36% from 1989 to 1999.
- “Because of this fundamental concern, pediatricians now warn that today’s children may be the first generation of Americans since World War II to die at an earlier age than their parents.” Louv, 2008

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Technology Changes *When* Kids Play

- Today’s society encourages kids to be productively scheduled all the time, which leads to over-scheduled kids, which means there’s not much time left for child-directed, free play.
- Because our society does not value play, it is rapidly disappearing from our homes, neighborhoods, daycares and schools.

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Organized Sports

- While play is on the decline, organized sports for young children are on the rise.
- “The obesity epidemic coincides with the greatest increase in organized children’s sports in history...The physical exercise and emotional stretching that children enjoy in unorganized play is more varied and less time-bound than is found in organized sports... Play in natural settings seems to offer special benefits.” Louv, 2008 p. 48

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What happened to tag?

Playing in the Backyard

- Child-directed play
- Encourages creativity & flexibility
- Teaches compromise and conflict resolution with peers; important life skills
- All participants are actively engaged; no "practice" per se
- Intrinsic motivation/play because it's fun/bragging rights

Organized Sports

- Adult-directed play
- Rule-based
- Adults intervene; kids become dependent on adults when social conflicts arise
- Lots of waiting around in practice for a turn to hit the ball, catch the ball, kick the ball
- Extrinsically motivated by wins and losses/winning the trophy

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Technology Changes *Who* Kids Play With

- Technology negates the impact that proximity should have on interactions with others
- Kids may be in the same room with each other, but if they are each engaged in their own electronic activity, then it can be challenging to focus on building relationships with other people

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Technology Changes *What* Kids Play With

- Instead of playing with real objects that can be manipulated in real life while integrating the senses, kids are often playing with pretend or virtual objects on a screen that can only be manipulated with the finger tip or thumb.
- Doing a real puzzle is NOT the same as completing a puzzle on the iPad. Coloring with crayons is not the same as coloring on the iPad. Bowling on the Wii is not the same as going bowling at the bowling alley.

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In a Nutshell

- Technology changes the landscape of play
- We live in the Digital Age and technology is here to stay
- Be sure parents and caregivers understand the importance of non-electronic, non-screen play in the development of young children
- Balance needs to be a priority – Technology in addition to, but never in lieu of

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A feasible and fair recommendation

For every hour a child spends in front of a screen, he or she should have equal amount of time spent in non-screen play

**This recommendation does not apply for babies and toddlers

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How TV & Other Screen Technologies Impact Early Child Development

96

As therapists and educators we are obligated to look at the available research regarding the implications of TV/screen time on development and then convey the evidence-based information to parents and caregivers

With all screen-based media we must consider 3 variables:

Quantity, Quality & Context

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The distraction of TV and other screen technologies is ever-present, making playtime the exception rather than the rule for many young children today



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How TV Can Facilitate Development

TV has the ability to be a tool that can facilitate development for children when they reach a certain age/developmental level when the following criteria are controlled for:

- Quantity (less is more)
- Quality (educational vs. entertaining)
- Context (co-viewing, background vs. foreground)

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How TV Can Hinder Development

TV can become detrimental to the development of young children when:

- Child watches too much TV
- Child watches inappropriate content on TV
- Parent uses TV as an electronic babysitter
- TV is on all the time (background TV)

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How TV/Screen Time Negatively Impacts Development

- Less time spent in creative play
- Less time spent interacting with other people
- Disrupts/interrupts playtime
- May be related to attention issues
- Decreases length of play episodes
- Encourages passive entertainment vs. active play
- May adversely impact language development
- May cause sleep issues
- Physical concerns
- Vision may be negatively affected

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Screen Time & Vision The Vision Council.org

- Digital devices have created a new phenomenon – more children are experiencing eye strain from staring at the screen for too long which can lead to blurry vision, eye fatigue or focus problems
- Eye care providers have reported an increase of myopia
- Causes include an increase in near-range activities such as the use of digital devices AND a decrease in exposure to natural light through outdoor activities

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Screen Time & Vision

- The rate of myopia (nearsightedness) has increased considerably over the past decades (25% in 1970 in the U.S. to 42% in 2000)
- One study looked at childhood rates in Singapore and Sydney: Rate of myopia in children in Sydney = 3.3%; Rates in Singapore = 29.1%
- Children in Sydney spent 14 hours per week outdoors compared to 3 hours per week for children in Singapore
Rose et al 2008
- **Conclusion: children who spend more time outside are less likely to become myopic**

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Children with Vision Impairment

- These children may benefit from lighted screens
- WonderBaby.org created a list of iPad apps appropriate for children who are blind or visually impaired
- These specialized apps are designed to stimulate the use of vision, improve fine motor skills, teach the child about cause and effect, enhance literacy and communication skills

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Physical Concerns

- Technology use restricts movement and can result in delayed development (gross, fine & sensory)
- Limited use of hands leads to a plethora of concerns
- Children may have core strength issues (muscles in the abdomen, back, chest and neck) – weak core means that tasks that should take no effort at all become laborious tasks that demand their full attention
- Hand held devices promote poor posture – hunched over for long periods of time staring at the screen – poor posture can cause subluxations or misalignments in the child's spine which can lead to other health issues

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What causes weak core?

- Low muscle tone
- Underdeveloped vestibular systems
- Retained reflexes (such as Tonic Labyrinth Reflex and Symmetrical Tonic Neck Reflex)
- Lack of movement and exercise to build strength

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Screen Time & Sleep

Dr. Christakis, 2006

- Melatonin is a sleep promoting hormone produced in the brain – we begin to secrete it when it grows dark and bedtime approaches
- The retinal ganglion cells, located in the back of our eyes, play a key role in releasing melatonin
- Even brief exposure to light can suppress/delay melatonin to be produced which prevents us from feeling sleepy
- It's difficult to fall asleep at 8:00 p.m. in the summer even though many kids can do it in the winter – the bright sun late in the day suppresses melatonin release

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- Intensity of the light matters (measured in Lux) 10 birthday candles = 1 lux; sunny day = 75,000 lux; well lit office = 500 lux; typical home = 200 lux
- Research shows that exposure to 200 lux for 30 minutes is enough to suppress melatonin secretion (Aok et al., 1998)
- Not all colors of light are the same – intense blue light is the most effective at suppressing the release of melatonin
- **The blue glow of the screen is suspected to interfere with melatonin release and thus interfere with sleep**

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TV/Screen Time & Sleep Recommendations for Families, Dr. Christakis

- Reduce television viewing in the evening
- Remove TV from child's bedroom
- If TV viewing occurs within 3 hours of bedtime it should occur in a dark room with child at least 5 feet from screen (context matters)
- Avoid frightening or violent programming (content matters)
- If child does see scary programs, explain what child saw and emphasize they are safe from that threat
- Avoid the evening news, especially if child is under age 10

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Does Content Matter?

- The amount of time children spend in front of a screen is one issue, and content is another.
- Most experts agree that content is critical.
- Types of media content:
 1. Entertaining
 2. Educational
 3. Violent
 4. Pro-social

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Does Content Matter?

"Certain specific physiological mechanisms of the eyes, ears, and brain respond to the stimuli emanating from the television screen regardless of the cognitive content of the programs. **It is a one-way transaction that requires the taking in of particular sensory material in a particular way, no matter what the material might be. There is, indeed, no other experience in a child's life that permits quite so much intake while demanding so little outflow.**"

-Winn, 2002

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Does Content Matter?

The content of the programming directly impacts whether there are positive or negative effects for the child.

Just because a show is animated, doesn't mean it's appropriate for children!

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Does Content Matter?

- Research indicates that repeated exposure to violent programming makes it seem more acceptable and desensitizes children while exposure to pro-social programming encourages children to be more helpful, to share and to be more empathetic.
- "The evidence that pro-social television viewing leads to good behavior in children is almost as strong as the evidence in support of media violence leading to aggression."
Christakis & Zimmerman, 2006

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Violence on TV

- Violence on TV is frequently glamorized (*even the good guys are violent sometimes*), sanitized (*many violent incidents result in no actual physical harm to the victim*) and trivialized (*violence often includes some humor*).
-Strasburger, Wilson & Jordan, p. 149
- Kids who watch violence on TV are more likely to show aggressive behaviors and are also more likely to fear that the world is a scary place and bad things will happen.
-kidshealth.org

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Violence on TV

- Entertaining shows often contain a lot of violence whereas educational shows usually do not – more “good guys” vs “bad guys” like Dora vs. Swiper the Fox
- Violence on TV is not a new phenomenon
- Many of us grew up watching violent but humorous cartoons such as Tom & Jerry, Scooby Doo, Bugs Bunny
- Fairytales are also based on evil and violence (Snow White, Cinderella, Sleeping Beauty)
- The *amount* of time you & I spent watching TV as children is different compared to children today in the 21st century

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Recommendations for Reducing Exposure to Violence on TV

- Avoid the evening news
- Minimize violent cartoons
- Avoid horror movies
- If there is violence, be sure there are consequences for the bad guys
- Emphasize difference between fantasy & reality

-Christakis & Zimmerman, p. 93-95

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Pro-Social Programs

- There is some evidence that viewing certain pro-social educational shows correlates to improved cooperation, organization, sharing, selecting challenging tasks and improved flexibility in play. Pro-Social shows include:
 - Mister Rogers
 - Sesame Street
 - Barney
 - Dragon Tales

Guernsey, 2007

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Entertaining vs. Educational TV

- Rewind back to the 1970s...
- Cartoons used to be for entertainment purposes (Bugs Bunny, Popeye)
- There were also educational shows designed for kids (Mister Rogers Neighborhood, Electric Company)
- Today, in the 21st century there has been a push to create a new kind of show for kids that combines entertainment and education – “Edutainment”
- How is educational programming defined?

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Educational Programming

- Because young children are developing so rapidly, TV shows must cater to a very narrow audience to make them truly educational – what is educational for a 3 year old might be boring for a 4 year old
- Also must consider the language level, cognitive level and past experiences of the child – it is difficult to design one TV show that is individualized for a wide age range of kids

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What Makes Media Educational?

- Content is appropriate for child’s age and experiences
- Programming is developmentally appropriate for the intended audience
- Moves at an appropriate pace (slow and steady)
- Repetition of key concepts
- Should contain simple storyline and storybook structure (beginning, middle & end)
- Has specific developmental, social or educational goals embedded into the storyline

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- Designed to get viewers to participate in the activities
- Characters should do something that illustrates what the scene is about (*action, dialogue and message should be directly related to each other*)
- Thoughtful use of scene cuts (*adequate time should be spent teaching new concepts*) and changes in time (*young kids don't understand things like flashbacks*)
- Co-viewing with children increases educational value
- To be called educational the content should be reviewed by educational experts (evidence-based)

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Educational Shows

Lots of research has been done regarding the following educational shows, which have been shown to increase academic and social skills:

- Blue's Clues
- Dora the Explorer
- Dragon Tales
- Barney
- Mister Rogers
- Sesame Street

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Sesame Street

The research is not as favorable for Sesame Street prior to 2001 even though the show has always been traditionally recognized as "educational" – Why not?

- Utilized the magazine format which is cut-up and rapidly jumped from scene to scene – criticized for being too frenetic
- Each episode was 60 minutes long – too long for most young children
- Trademark "letter and number of the day" was too advanced for their youngest viewers

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New and Improved Sesame Street

In 2001 Sesame Street came out with a new format that better facilitates learning

- Reduced show to 45 minutes
- Added a 15 minute show within a show at the end called "Elmo's World" designed to reach younger viewers
- Created predictable routines on the show – more like real preschool
- Included interactive, participatory games
- Changed from the magazine format to narratives

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Preschool Channels

Very young children are now being "schooled" by TV, many kids starting their TV-viewing careers as babies...

PBS: Commercial free but has sponsors like Chuck E. Cheese

Nick Jr: Geared for 2-7 year olds; Tagline "*The Smart Place to Play*"

Disney Jr: geared for 2-7 year olds; 24 hour educational preschool programming

Noggin: Commercial-free channel that designs shows for 2 to 5 year olds; Tagline "*It's like preschool on TV!*"

Sprout: Geared for 2-5 year olds; 24 hour preschool channel

Baby TV: Educational TV designed specifically for infants and toddlers

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"Preschool on TV"

Can "preschool on TV" legitimately replace actual preschool? No...Why not?

- Learning is passive (child is often sedentary) instead of active
- Learning is not a multi-sensory experience (only senses used are vision and hearing)
- Learning occurs in 2D instead of 3D
- Learning is a solitary experience instead of a shared experience with peers
- Learning is adult directed (all kids need some time to learn during child directed activities)

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Foreground TV vs. Background TV

- Foreground TV: child-directed programming; direct exposure
- For children birth to age 6 it is estimated that foreground television exposure is about 80 minutes per day
- Background TV: adult-directed programming not designed for young children; TV is on but the child is participating in other activities
- Background television exposure averages 4 hours per day: 6 years old are exposed to 2.75 hours of background television per day while children under age 24 months are exposed to 5.5 hours of background television per day (Lapierre 2012)

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Research on Background TV...

- Exposure to background television is negatively associated with children's cognitive functioning and social play (Schmidt, Pempek, Kirkorian, Lund & Anderson 2008)
- Background TV may disrupt cognitive processing indirectly because it distracts young children from focusing on exploration and play (Ackerman & Brown 2010)
- Background TV is shown to be associated with a negative effect on language development, cognitive development and executive functioning skills

(Barr, Zack & Calvert 2010)

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- Background television exposure has been linked to decreased sustained attention and lower quality parent-child interactions

(Kirkorian, Pempek, Murphy, Schmidt & Anderson 2009)

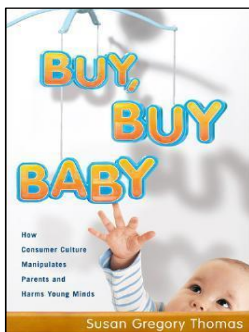
- Based on the evidence, in the 2011 policy statement from the American Academy of Pediatrics there is a section on background TV that urges parents with children under age 2 to be mindful of their own TV watching as it *"can have a negative effect on their children"* and *"is distracting for both the parents and the child."*

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Does Content Matter?

- According to the AAP, kids in the U.S. see 40,000 commercials per year; under age 8 most kids don't understand the purpose of commercials/advertising; children under age 6 are often unable to distinguish program content from commercials
- The AAP recommends limiting kids' exposure to commercials by: watching PBS or other commercial free channels, recording programs/fast forwarding through the commercials, watching commercial free DVDs
- Avoiding commercials is important!

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The Commercialization of Childhood

What babies and toddlers do learn from media is to become attached to commercialized characters such as Elmo or Spongebob

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Recommendations for families on ways to reduce background TV

- Start by coaching parents on *why* they should limit background TV
- Turning off the TV when no one is watching it
- Simple changes in routines such as turning off the TV when a show is over
- Turning off the TV at key points during the child's day such as bedtime, mealtime, & when playing with toys
- Specific time guidelines: At 10:00 we're turning TV off
- Replace background TV with music

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TV and Attention

- As therapists & educators, we frequently document concerns with a child's limited attention
- Paying attention requires filtering...
 1. Involves selection of pertinent information *and*
 2. Exclusion of non-pertinent information
- Paying attention also requires thought (concentration and focus)
- Looking at something is not the same thing as paying attention (*attention = thinking while looking*)

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Screen Time & Attention

- 2004 (Christakis et al.) study of preschoolers found that for each hour of TV watched per day, children had a 10% higher chance of developing attention problems at age 7:
 - increased restlessness
 - poor concentration
 - impulsiveness
- 2010 study found that children ages 2 ½ to 4 ½ who spend more than 2 hours per day in front of a screen are at greater risk of attention, learning, social and behavior problems

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TV and Attention

- "Careful experiments have shown that engagement reaches a maximum after about 20 seconds of looking at an object or scene. Shorter looks are less likely to produce thoughtful looking and more likely to result in rapid distraction. In this sense, **rapid scene changes on television can keep a child looking but not thinking.**"
Christakis & Zimmerman, 2006
- Frequent exposure to high speed media content can cause attention deficits as well as decreased concentration and memory, due to pruning of neuronal tracks to the frontal cortex.
Christakis, 2004

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TV and Attention

- Some children are easily distracted and can't filter out non-pertinent information – easy distractibility is one of the hallmarks of ADHD
- **TV is inherently distractible thanks to rapid scene changes, catchy jingles and flashy graphics**
- Young children are "glued" to the TV or mesmerized due to something called the orienting reflex (the "*what's that?*" reflex that causes the brain to quickly look at something new or unexpected)

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TV and Attention

- One of the signs of ADD is the ability to focus for hours on TV or video games, but an inability to focus in a classroom setting
- TV shows and video games with fast paced scene changes and constant rewards are easier for a child with ADD to focus on – linked to the dopamine squirt – instant gratification
- The classroom does not provide constant rewards and the tempo is slower – hence no dopamine squirt – it mimics real life – it requires delayed gratification

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TV and Executive Function

- Research: The Immediate Impact of Different Types of Television on Young Children's Executive Function by Lillard & Peterson (2011)
- Objective: to study whether a fast-paced TV show influences preschool-aged children's executive function (planning, organizing, self-regulation, working memory, paying attention)
- Results: children who watched the fast-paced cartoon (Spongebob) performed significantly worse on the executive function tasks than children who watched the slower paced educational show (Caillou) and children who spent the time drawing.

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Screen Media and Language Development

- 90% of children under age 2 are watching TV or videos and 1 in 3 children are using tablets and smartphones before they can talk – so we need to examine the impact of all this screen time on language development
- According to the research by Dr. Christakis, most of the popular baby videos don't promote language development; they have rapid scene changes, quick edits, and they are lacking the 'parent-ese' type of speaking style that parents use when talking to babies.

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Make your baby smarter videos... Doing more harm than good (Zimmerman et al., 2007)

- Research has shown that DVDs designed for babies such as *Baby Einstein* and *Brainy Baby* actually delay language development in toddlers
- For every hour per day spent watching these cleverly marketed DVDs, babies learned 6-8 fewer words than babies who never watch the videos
- Most detrimental effect was on 8-16 month old babies
- In 2009 Disney started offering refunds to parents who had purchased Baby Einstein DVDs because of their false claims – Disney dropped the word "educational" from their marketing campaign to avoid future lawsuits

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TV and Language Development

- Some programs are effective at teaching vocabulary words/teaches kids to label
- But videos are not good for teaching the nuances of speech and grammar (Guernsey, 2007)
- Passive listening isn't enough to learn language
- A child's expressive labeling vocabulary is not the same as functional expressive language skills
- *Learning words does not = learning language*
- Interaction is a necessary component for learning language

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Background TV & Language Development

- The background TV noise can interfere with the baby's or toddler's ability to learn language
- The child may have difficulty differentiating sounds and attaching specific sounds to meanings
- Studies have found that a child's cognitive development and language skills are correlated to how much chaos is in the home: lack of routines, multiple people coming and going, high stress, constant background noise
- Another point to ponder...what is foreground TV for a 4 year old is background TV for a 1 year old.

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Screen Time & Language Development

- The lack of face-to-face interaction when using a screen is the one of the biggest concerns related to language development
- Non-verbal language cues/gestural communication/facial expressions are lost
- "It is questionable whether conversational maxims such as turn taking, response, appropriateness, relevance, formality level and continuation are adhered to in electronic communication." Watt, 2010

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Screen Time & Language Development

- Lexical development/vocabulary can improve with educational programming; but there is little indication that children learn much about grammar from TV viewing Naigles & Mayeux, 2001
- Vocabulary certainly matters...a lot
- A child's vocabulary before entering school is a strong predictor of his academic performance in the future
- Children's academic success at age 10 is attributed to the number of words the child hears before age 3 zerotothree.org

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“The Early Catastrophe: The 30 Million Word Gap” by Hart & Risley, 1995

Fascinating study that looked at the importance of language exposure in the early years

- In a 100 hour-week the average child in professional families heard 215,000 words
- average child in a working-class family heard 125,000 words
- average child in a welfare family heard 62,000 words
- In a 5200 hour-year, that would be 11.2 million, 6.5 million & 3.2 million words respectively
- By the child's 3rd year of life that is more than a 30 million word gap!

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TV & Language Development

“Adults may think that children will simply pick up new words by hearing them on TV, regardless of how or when they are said. But for young children, it's not that easy. ...how well a show succeeds at making words “stick” depends almost entirely on how and when the words are said, how much repetition is employed, and whether the words are spoken in a context that a very young child can comprehend.”

-Guernsey, 2007

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What the Research Says about Educational Programs

- Researchers Linebarger & Walker discovered some positive links between programs with strong story lines and language development in young children.
- Over a 2 year period they studied toddlers to see if shows designed with “specific language promoting characteristics” could help toddler learn language.
- The data produced some interesting correlations: children who watch *Dora the Explorer* & *Blue's Clues* had stronger receptive vocabularies at 30 months than the kids who didn't watch those shows.

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- The shows *Arthur & Clifford*, which use storybook formats, were also shown to improve receptive vocabularies when compared to the kids who didn't watch those shows.
- The researchers also looked at expressive language – and the same 4 programs *Blue's Clues*, *Dora*, *Arthur & Clifford*, were all linked to positive growth.
- One of the conclusions: viewing the same show repeatedly helps children learn certain aspects of language.

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Different shows emphasize different skills

Sesame Street: good at teaching basic reading skills
Electric Company: teaches elementary level reading
The Magic School Bus: teaches elementary level science
Mister Rogers' Neighborhood: teaches pro-social values
The Wiggles: gets kids up and moving around
Blue's Clues: encourages flexible thinking
Barney: teaches manners and imaginative play
Bob the Builder: emphasizes conflict resolution, cooperation and socialization
Arthur: focuses on relationships; addresses social and health issues that affect young children

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Certain programs didn't fair as well...

- Teletubbies was found to have a negative correlation with language growth
- Shows where they talk in altered voices, such as The Muppets, were found to be confusing for children still learning to talk
- Winnie the Pooh relies on flashbacks – too complex for young children
- Richards Scarry videos – too dizzying- “incomprehensible”
- Sesame Street was also associated with less growth in expressive language - The format of Sesame Street was found to be part of the problem

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Typical vs. Delayed Development

- Children who are learning language in a typical manner will likely benefit from educational programs that expose them to new vocabulary words. The programs should mimic the way a good preschool teacher or parent would talk to a young child using simple, repetitive language with straightforward story lines. The words should match what's happening on the screen.
- But if language skills are coming slowly/child is delayed, the child will not benefit as much from the screen. Rather, the child needs lots of one-on-one conversation time, building the necessary foundation skills.

Guernsey, 2007

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TV and Very Young Children

- Children under age 2 are unlikely to benefit from watching educational media; under age 3 is still questionable
- In videos designed for the under 2 crowd, images of every day objects and toys are shown in random fashion that is set to music – typically without any narration or storyline-this is not representative of how we talk to babies in real life
- Very young children benefit most from real life experiences, not virtual experiences
- Young children often try to grab what they see on the screen – a sign that they do not yet understand the symbolism
- “Narrative Deficiency” and “Video Deficit Effect”

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Video Deficit

- Video Deficit Effect: Many research studies have demonstrated that infants and toddlers learn less from television and 2D images than from live face to face interactions (Zack et al, 2009)
- In one study, children age 12-36 months were able to imitate an action when they saw it live; but watching the same thing on a screen made it more difficult to comprehend (Barr & Hayne, 1999)
- These young kids had to see the video repeatedly before any imitation occurred

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Video Deficit

- TV and other screen devices are not optimal for learning language (can be good for teaching vocabulary, but true interactive language where communication partners build on what the child is seeing or doing is best for teaching language)
- It's the responsiveness that's key; the back-and-forth social interactions are what matter most for very young children

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Video Deficit

- Another study looked at the effect of video viewing on language acquisition in children age 30-42 months
- Results of the study showed that very young children learn best through interaction with a live person or through video chat that allows both audio and video interaction (Skype); but these young children didn't learn well from video instruction alone (Roseberry, Hirsh-Pasek, & Golinkoff, 2009)
- What the research tells us: communication is enhanced when children are responded to in timely and meaningful ways (something videos cannot do)

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Narrative Deficiency

- Very young children lack the ability to comprehend stories (narrative deficiency)
- “Narrative deficiency” is one of the reasons TV isn't effective for the under 2 age group – It is difficult to embed a lesson if the child doesn't understand the story
- It is difficult for a child to follow a story until he can recognize the passing of time...beginning, middle, end
- Around age 2 ½ is when video & narrative deficits start to resolve
- This is the primary reason most educational shows are designed for 2-5 year olds

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TV & the Under 2 Crowd

- Results showed that around 24 months, babies start to comprehend and discriminate between a “normal” show and a “scrambled” show. At 18 months the babies could discriminate a bit, but the differences were not quite as sharp. Babies age 6-12 months showed no signs that they were comprehending what was even on the screen. (Pempek et al., 2007)

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Guidelines for TV & Young Children

- Limit how much TV is being watched (*quantity*)
- Screen time should be discouraged for children under age 2
- Be selective in what is being watched – think educational vs. entertaining and violent vs. pro-social (*quality*)
- Be mindful of background vs. foreground TV (*context*)

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What Parents Can Do

- Watch TV *with* your child
- Talk about the characters
- Point out and label things seen on the screen (use the remote to pause)
- Be active while watching TV (dance to the music, waddle like a duck, hop like a bunny, fly like a plane)
- Connect what the child sees on TV to real life
- Avoid using TV as a babysitter or to put child to sleep
- Turn the TV off when the show ends

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Technology and Social-Emotional Development

Relationships Matter

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Relationships Matter

“...there is a lot of other research that shows the main learning and sustenance for young children — particularly under 2 — comes from their relationships, particularly with their parents and whomever takes care of them.”

-Tovah Klein, Director
Barnard College Center for Toddler Development

Read more: <http://www.nydailynews.com/news/national/toddlers-risk-tech-experts-study-shows-soars-article-1.1747694#ixzz2ycrivoEE>

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The Parent-Child Relationship: Responsive Caregiving

1. **Be Engaged:** Talk to your child, look at books with your child, play with your child, get on the floor, follow your child’s lead, respond when your child tries to get your attention, imitate your child’s actions and sounds, be interesting and be interested
2. **Be Intentional:** Embed strategies into everyday activities and routines - play with a purpose, grocery shop with a purpose, have snack with a purpose, etc. - look for learning opportunities during everyday activities rather than setting aside special time to work on specific skills out of context

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3. **Be Sensitive:** Respond appropriately to your child's pace, emotions, interests, language level, and sensory needs in a pressure free manner – avoid instructing your child to say words or perform on command - limit the number of questions (life is not a quiz!) – keep interactions natural
4. **Be Playful:** Interact with your child in a fun, light-hearted manner; be animated and avoid being too serious – laugh with your child and enjoy making your child laugh, be childlike (not childish!); strive to be a play partner instead of a play director; focus on the relationship instead of a specific toy or skill

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Relationships Matter



1. Proximity
2. Joint Attention
3. Joy

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Relationships Matter

- Children may learn some concepts through educational TV programs, apps and online games but it is important to understand that young children learn best through hands-on, interactive, sensory-rich experiences with real people.

Story Book: [Doug Unplugged](#)

- A child's first and most important toy is his parent. There is no app you can download or toy you can purchase that will ever be more important to your child's development than the TIME you spend interacting with, talking to and playing with your child.

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Adults should strive to spend more time with young children and less money on them.

Children need more of our PRESENCE and fewer PRESENTS!

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Relationships Matter

- Today the digital connection is strong but the interpersonal connection is frequently missing.
- In this digital age parents must work harder than ever to build strong relationships with their children because we live in a world filled with distractions.
- Being truly present requires more than just being in the same room with a child – it requires us to be engaged. Technology often steals our attention and time away from our children. We are often present in body, but not in tune with the child. Being present in a child's life is important and requires a parent's conscientious effort.

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Relationship Based Learning vs. Screen Based Learning

- As electronic media use increases, time spent in face-to-face social interactions decreases.
- Social interaction/eye-to-eye contact has gone down while eye-to-screen contact has gone up.
- Today people spend more time in front of a screen than they spend interacting with other human beings.

Sigman, 2009

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Digitally Distracted Parenting



Children gain communication and social skills by listening, talking and interacting with their parents – these interactions are lost when parents are digitally distracted

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Social Media/Interactive Technology

- Concern of “social media” is that it is actually an isolating activity and “interactive technology” is an interesting term because the interaction is with a device
- The importance of parent-child interaction and joint attention is critical for learning to occur
- Technology is here to stay/it is ubiquitous so we need to be sure it is being used as a tool to enhance learning and to facilitate relationships
- Let’s examine how we can enhance social interaction and engagement with social media and interactive technology

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Joint Media Engagement (JME)

- JME refers to spontaneous and designed experiences of people using media together: shared attention when viewing, playing, searching, reading & creating with digital or traditional media
- We should coach parents, caregivers and professionals on the importance of JME: the goal is to facilitate adult-child interactions or peer to peer interactions during media use rather than detract from them
- JME reminds us that relationships will *always* matter

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Joint Media Engagement



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Joint Media Engagement

Young children benefit most from digital media exposure when a more capable individual mediates the experience with them

(Takeuchi & Stevens, 2011)

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Components of Joint Media Engagement

- At least 2 people must participate
- One shared content delivery system
- A common focal point
- Must be at least partial attention to the medium
- Must be at least partial attention to other participant(s)
- Interaction among participants
- Active engagement among participants (viewing, playing, reading, creating, searching)

(Stevens & Penuel, 2010)

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JME in a Classroom



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A computer lab does not promote JME



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Smart Boards Promote JME

1 shared
medium

Common focal
point

Engagement

Partial attention
to participants

Multiple
participants

Interaction



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Developmentally Appropriate Use of Technology for Therapists & Teachers

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Our Professional Responsibility

- Pediatric therapists and educators must be digitally literate in the 21st century
- NAEYC defines digital literacy as having the knowledge and experience to think critically about the selection, analysis, use and evaluation of technology and media for young children
- NAEYC encourages us to be continually educating ourselves on the appropriate use of technology or we risk making inappropriate choices that may negatively impact learning and development

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- We want to avoid teaching skills out of context but rather teach meaningful skills that can be used during daily routines that occur naturally throughout the day
- When technology is utilized it should enhance learning
- "Technology should be used as a tool in instruction, not the focus of learning."

Barron et al., 2011

- When using technology we must ask ourselves "What functional skills is the child gaining and how is this virtual experience better than the real one?"

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Our Professional Responsibility

We need to strive to find that critical balance between technology/digital media use and other educational and enriching activities that foster creative play, social interactions with both peers and adults and outdoor, sensory rich experiences

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Developmentally Appropriate Use of Technology: Best Practices for Infants & Toddlers

NAEYC 2012

- Exposure is inevitable. Adults can use shared technology time as an opportunity to talk with young children, use new vocabulary and model appropriate use.
- Any technology usage with this age group must be done in the context of interactions with adults. Infants and toddlers need direct contact/interaction with real people.
- Avoid passive screen time. Limit the use of technology as a digital babysitter.

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- Technology can be used as an engaging tool to provide infants and toddlers with direct interactions with their long-distance family and friends (Skype).
- Videotape therapy sessions/playtime/outings - encourage family to watch them with their child.
- Encourage family to videotape difficult routines during the day to share with the therapist/teacher.
- Technology should not replace opportunities for active engagement with the real world unless the child is unable to explore on their own because of his or her disability.

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- Take pictures of child's favorite objects and people on smart phone or tablet to use as a portable book.
- Use video files to document child's developmental gains/progress in therapy.
- For the purpose of assistive technology be sure to consider the child's individual strengths and needs (physical, cognitive, language, social) before selecting a device or app.
- Begin with low-tech or no-tech and build up as appropriate (don't let the glamour of high-tech devices interfere with sound professional judgment).

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Developmentally Appropriate Use of Technology: Best Practices for Preschoolers & Kindergartners

NAEYC 2012

- Provide opportunities for children to explore and get comfortable using keyboard, mouse, and touch screens.
- Capture photos of artwork or block constructions that children have created.
- Videotape dramatic play for children to watch.
- Provide access to experiences children may not otherwise encounter/virtual field trips.

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- Celebrate children's accomplishments on a digital projector or classroom website.
- Allow children to freely explore touch screens loaded with well designed, developmentally appropriate interactive media experiences.
- Incorporate assistive technologies as appropriate for children with special needs.
- This age group of children should be exploring their ability to create & communicate using a variety of media (crayons, play-dough, paint, blocks, dramatic play, digital technologies).

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- Based on a theme that is interesting to the children, search digital files for photos of people, places, animals and objects and talk to them about what they are finding.
- Don't allow technology to compromise other developmental opportunities such as physical play, outdoor exploration, art, music, social interactions
- Technology should not drive the learning in early childhood classrooms but rather should be used to expand, enrich, individualize and extend the curriculum.

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- While technology is part of the educational landscape in early childhood classrooms we need to keep some areas technology free (dramatic play center, classroom library, sensory area). Young children need hands-on playtime and interactions with peers to develop real life skills.
- Enhance screen time by ensuring Joint Media Engagement (JME) is occurring.
- Kids need ample time for movement and exercise (most high-tech devices contribute to sedentary time).

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Why therapists like the iPad/apps

- Immediate fascination/ "love at first swipe"
- Large touch screen
- Easy to use
- Establishes joint attention
- Teaches cause and effect
- Video modeling
- Visual scanning
- Vocal imitation
- Following directions
- Enhances certain fine motor skills (pointing, hitting a target)
- Turn-taking
- Picture association
- Vocabulary building
- Cognitive concepts such as sequencing & categorizing
- Pre-literacy
- Early math skills

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The 7 Ps of Using Mobile Technology in Therapy (DeCurtis & Ferrer, 2011)

1. **Preparation:** what is the rationale for integrating a mobile device with a child versus traditional toys alone?
2. **Participants:** what is the child's age and developmental level and should this device be used individually or in a group?
3. **Parameters:** how much time will be spent integrating the device and which environments will yield the best results?

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4. **Purpose:** what is the advertised purpose of the app and how can it meet your client's individual goals?
5. **Positioning:** what are the effects of sitting side-by-side versus face-to-face and would the child prefer to be at the table or on the floor or on a lap?
6. **Playtime:** how will you incorporate the child's preferred style of play with the device and how will you experience shared enjoyment?
7. **Potential:** how will you extend and expand the learning gained from using an app to real-life experiences?

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Using the Wii Therapeutically

- A study in the Journal of Pediatric Physical Therapy (Spring 2012) looked at motor outcomes following an 8 week family based intervention using the Wii with a 12 year old child with Down Syndrome.
- Results of the study concluded that 8 weeks of repeated practice using Wii bowling, baseball, bowling and snow boarding was shown to improve the child's upper motor coordination, manual dexterity, balance, postural stability and control. Wii can serve as a fun and functional form of socialization that has positive developmental outcomes.

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Video Modeling

(Corbett & Abdullah)

- Video modeling is an evidence based intervention used to improve language, social behavior, play, academics, and adaptive skills
- This methodology is particularly effective for children with autism
- Video modeling started in the behavioral sciences field to facilitate observational learning
- It involves the child observing a video of a model engaging in a behavior that is then imitated and practiced

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4 Types of Video Modeling

1. Basic Video Modeling: Another person (usually a peer) models the desired behavior or skill you are trying to teach. The individual with autism then watches the video and models/imitates the behavior.
2. Video Self-Modeling: Video the student with autism successfully completing a skill (editing out the prompts or the models by the adult).

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3. Point of View Modeling: Show the child with autism what completing the task looks like from his or her point of view
4. Video Prompting: This is the type of modeling where the video serves as a cue for the steps involved in a certain task. This might be the most beneficial type of video modeling to teach life skills (such as brushing teeth, doing laundry, etc). This allows the task to be broken down into steps (task analysis) while the other types of video modeling focus on the whole skill.

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Why video modeling works so well for children with Autism Spectrum Disorder

(Corbett & Abdullah)

- Typical features of autism such as over-selective attention, restricted field of focus, preference for visual stimuli, and avoidance of face-to-face attention can be capitalized on while using video modeling
- Children with autism benefit from visual information more than verbal information
- Videos mimic real life more than pictures (this is why we can learn from You Tube videos)

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- Video modeling offers a way to learn through social models without requiring actual face to face interaction
- The screen by design provides a restricted field of focus – thus video modeling appears to improve the attention of children with autism by focusing attention on relevant stimuli
- Video modeling interventions present repeated exposures of the same event to help the child establish and maintain the behavior in memory – real life can't be repeated in this way in most instances

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- Video modeling techniques are typically active which allow the child to practice the observed behavior (learn and do)
- Since most children with autism show a strong affinity for excessive TV and video viewing, video modeling is a highly motivating intervention
- The video can be edited to simplify situations or to avoid common distractions that normally occur in real life – sometimes the sensory distractions make the real world too over-stimulating an environment in which to learn

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Using Computers in Early Childhood Classrooms: Best Practices

- Provide a computer center as one of the many valued learning centers in the classroom.
- Don't sacrifice resources for important classroom materials such as books, blocks, play dough, puzzles, paint, etc. to purchase and maintain computers.
- Avoid using computer labs. It's difficult to integrate the ongoing classroom curricula if computers are isolated in a lab where children must attend at a specific time.
- Do not use computer time as a reward. Don't allow only "well behaved" children access to computers.

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Using Computers in Early Childhood Classrooms: Best Practices

- Avoid using computers for drill and skill activities.
- Select software that is developmentally appropriate and is sensitive to diversity.
- Remember that computer time cannot replicate concrete experiences, hands on learning, or exploration of the real physical and natural world.
- Do not allow computer use to distract children's time and attention from critical early childhood activities.

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Developmentally Appropriate Use of Technology: Best Practices for All Young Children

- Just as we teach parents to enhance development through social interaction and play with toys, we should coach parents on how to effectively use technology as a resource for learning
- As professionals we have the responsibility to coach parents that it's not the technology itself that enhances learning, but rather the strategies and techniques used during joint media engagement
- Avoid letting the digital device become just a source of entertainment

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Recent Update on Screen Time

- Dr. Christakis, a pediatrician on the AAP Council on Communication and Media states "We don't want to risk appearing so out of touch that we're irrelevant and people won't take our advice seriously."
- Zero to Three states "Screen time is most effective when adults and children use electronic devices together...with a push for 'screen time' to be much more than an electronic babysitter."
- Lisa Guernsey, director of the New America Foundation's Early Education Initiative states: "...it moves us from a 'no screen time' recommendation, that few parents abide, toward 'mindful screen time' in today's media-maniac world."

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Closing Thoughts...

Be sure technology is enhancing the experience, not detracting from it.

Avoid using technology to force-feed academics to young children.

Technology in addition to, but never in lieu of true play!

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Children's Picture Books on Technology Mindfulness

Doug Unplugged by Dan Yaccarino

Blackout by John Rocco

Chloe by Peter McCarty

Hello! Hello! by Matthew Cordell

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