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Toddlers and Technology: Teaching the Techniques

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As speech-language pathologists specializing in the communication development of children birth to age 5, we are accustomed to adapting materials and traditional educational tools to help children maximize their communication skills. We teach parents how to turn toys into language stimulation opportunities, and how the toy itself acts as a conduit for interaction. With the current wave of popular new and accessible technology, such as smart phones and easy-to-use tablet computers we are once again presented with an opportunity to introduce a tool as a viable and exciting resource for language and learning.

These tools are equipped with touch screen technology and are extremely durable, making them enticing to younger and less dexterous users. They provide immediate access to a world of learning, entertainment, and creativity for younger children, including those with more specialized needs. Therefore, SLPs working in early intervention and preschool have the opportunity to learn, understand, and use these tools by applying evidence-based and appropriate methods that focus on the interaction that occurs when building communication. Most importantly, SLPs have the responsibility to teach parents and families that it's not the technology that builds communication, but rather the techniques used that stimulate and create connections, which become the foundation for communication.

Apps for Everything

SLPs working in early intervention can play a vital role in helping family and team members gain the maximum benefit of these newer teaching tools. The specific applications, known as "apps," created for mobile devices such as Apple's iPod Touch, iPhone, iPad and iPad2, and Google's Android, have introduced immediately accessible activities for use in treatment and at home. SLPs are learning rapidly how to use this new wave of tablet technology most effectively, either through self motivation or because of encouragement from parents who are handing them to the therapist expecting him or her to know how to enhance their child's growth in communication, cognition, social skills, and motor development. As children, of all ages and skill levels are drawn to a tablet and its educational apps without any specific training, it becomes crucial for parents and team members to understand how to

address therapeutic goals and not let the tablet computer mainly become a source of entertainment.

Although not originally intended as a tool for children with special needs, the tablet computer is being compared to other augmentative and alternative communication (AAC) devices in various media reports The iPad was highlighted in the *Wall Street Journal* as an effective and more affordable communication tool for a 2-year-old with cerebral palsy (Valentino-Devries, 2010) while the iPad was hailed in the *San Francisco Weekly* as enhancing a child's communication and cognition in ways unexpected by his parents and teachers (Harrell, 2010) The mobile devices seem intuitive to children who can pick one up, press a button, and begin manipulating an app with very little direct teaching or modeling.

Sandra Calvert, a professor of psychology and director of the Children's Digital Media Center at Georgetown University, explained that the tablet computer interface maps onto how young children already think and perform tasks, including their early action-based learning and iconic and symbolic representation skills (Baute, 2010).

Child psychologist Jean Piaget (1998) described four stages of cognitive development that explains how children understand and assimilate new information. These stages support why a tablet computer appears to be intuitive for young children. His first sensorimotor stage ranging from birth to age 2 emphasized a primary means of learning through a child's senses and motor skills. Today, children are visually drawn to the apps' colorful illustrations and engaging musical accompaniment, and they explore the app through their sense of touch. Successful navigation of the apps involve gross- and fine-motor actions including pressing a button to activate it, isolating one or two fingers for pointing to or tapping on the screen, holding one or more fingers down to drag items around, using two fingers to zoom in and out, or sweeping a finger across the screen. Children also learn to manipulate the app by rotating, tilting, and shaking the device itself. The cumulative motor movements provide access to stimulating activities which offer immediate sensory and cognitive stimulation.

Piaget's preoperational stage from ages 2-7 described a child's ability to use symbols to represent objects, personify objects, and think about things and events that aren't immediately present. This allows young children to interact with the app and experience a virtual world while understanding and distinguishing this new style of imagination and pretend play. Because sensory input is a primary form of learning for toddlers, the interactive nature of a tablet and a SLP may offer a highly interesting and motivating visual and tactile experience that promotes learning readiness. The communication-building skills for which we have used the tablet include the following:

- Joint attention (e.g., looking for a bee who pops out from different places in Kezza Bee Peekaboo app).
- Visual scanning (e.g., following the colored dots that can be popped in Color Dots app).
- Vocal imitation (e.g., Talking Gina or Talking Tom apps that imitate your every sound or word, or Singing Fingers which records your voices as you draw on the screen).
- Taking turns (e.g., apps such as Wipe & Learn or Build-It-Up allow for each child to wipe to reveal a photo or virtually stack a toy).
- Following directions (e.g., any of the Cake or Cookie Doodle type apps give ample opportunities to follow directions for both the preliterate and literate youngsters).
- Picture association (e.g., Baby Touch and Hear Lite app allows the child to select a picture, hear

and see the name of the picture and the associated sound).
- Sound association (e.g., I Hear Ewe has the a field of 6-8 pictures which you can tap and hear a sound while keeping the screen facing away from the child and then turning the screen towards the child to select the picture which matches the sound).
- Vocabulary building (e.g., The Wheels on the Bus app is a favorite just like the song for teaching early lexicons of nouns, verbs, and prepositions as is Verbs With Milo app).
- Increasing expressive language length and complexity (e.g., Sequecning With Milo and Prepositions With Milo apps are great for expanding sentence length and complexity as the child sees Milo the mouse perform different acitivities.
- Stimulating spontaneous and novel utterances (e.g., Toca Tea Party and Toca Doctor are two apps that have child experience activities which stimulate questions and comments).
- Reinforcing and generalizing cognitive concepts such as sequencing and categorizing (e.g., Monkey Preschool Lunchbox app includes matching for color and size, putting together simple puzzles, 1:1 counting, and categorizing objects).
- Teaching pre-literacy and early math skills (e.g., The Dr. Suess book apps allow the child to tap on a word or picture and hear and see the word as it is highlighted).

There are thousands of apps that can be used with toddlers to target individual therapeutic goals or to simply enhance language learning.

Implementation

The implementation of apps as a teaching tool with young children from ages 1 to 5 has shown to be effective in building speech, language, and social skills with a wide array of our clients' communication disorders, such as autism spectrum disorders (ASD), Down syndrome; specific language impairment, auditory processing disorders, and apraxia.

In each session, The key is that we incorporate a tablet computer and selected apps while continuing the use of other integrating communication-building methods, such as Greenspan's Floortime ™, the language development programs of Hanen ®, and Gutstein's Relationship Development Intervention (RDI). These programs all focus on parents and family members as language facilitators, an approach that allows families to carry over the techniques to reach the child's goals with their own tech tools. They also focus on taking cues from the child by observing his or her expression, and waiting for a verbal or nonverbal response, then building on the interaction to extend the activity to its next natural step. All of the programs focus on the interaction between family member and the child as the main teaching tool, not on the toy or the tablet computer.

More specifically, he Hanen® program (Pepper & Weitzman (2004) teaches parents to allow the children to lead interactions, adapt to "share the moment," and add language and experience to improve their child's communication skills. When using a language-stimulation apps, such as "Monkey Preschool Lunchbox" or "Wheels on the Bus," the parent can apply the tenets of the Hanen® program by allowing the child to lead (e.g., he/she taps the screen on the object of interest), while the parent applies language by naming the objects and the actions of the child and those on the screen. Furthermore, the parent can expand the child's utterances and comment on the child's experience while engaging in a dynamic and novel activity

The interactive nature of many apps also can be illustrated by singing songs together, imitating each other's drawings, or building entertaining stories. An adult can get down on the floor with a toddler while exploring a simple but visually stimulating app (e.g., "Tesla Toy"), or have the toddler sit facing the adult while playing an imitation game (e.g., "Talking Tom"), or sit side-by-side while developing fine motor skills (e.g., "We Doodle"). Apps such as "Barney the Dog"and "I Close My Eyes" can be used to encourage description and storytelling. Apps that record a child's voice (e.g., "Talking Tom," "Wheels on the Bus") can be used to encourage children to vocalize more; the apps with sound-letter correspondence can be used to teach the child letter-matching and sound production (e.g., "First Words Shapes"). As many children with ASDs tune in to the visual stimuli, apps may become a tool to encourage engagement, and can serve as a start-up or back-up activity (e.g., the SLP can preload a tablet with apps the child finds interesting). Even better, if an SLP has wireless access to the Internet, she or he can immediately download additional apps that will suit the needs of that session.

Some Pointers

From our anecdotal experience, the most positive treatment outcomes have come from considering the "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?
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? Where will you and the family anchor the knowledge gained from the app to what the child already knows?

After a year of integrating a tablet into therapy with young children and guiding their families, these are some beneficial strategies to integrating mobile technology that focuses on the therapist's and parent's technique:

- Introduce the tablet by positioning it toward you to gain the child's auditory attention before turning it to the child and adding the visual stimulation. Hold the device up by your face to gain the child's attention. The similar size of a tablet computer allows for quick referencing from the device to the adult and back.
- Encourage holding the tablet below your face and in front of you to show the child how an app works and allow for integration of sequenced steps for later imitation.
- Although a child's natural tendency is to touch the tablet, don't let the child touch it when introducing an app so the child can truly focus on observing and processing the adult's actions.

- As the child receives and processes auditory input from the app's sounds, listen to the child's expressive communication and observe how the child shows interest. Build on the child's initiation.
- Look for ways to extend interactions by a variety of means, such as introducing a real toy associated with a virtual character, by imitating a character's movements, or by adding another direction from the app that it didn't offer, such as story retelling.
- Connect, Direct, Reflect: Make a meaningful social connection with the child first, followed by subtly directing the interaction based on the child's initiations with the mobile device, and conclude with both participants reflecting on what they learned with the app or carrying the skill over to another activity.

Not Always the Answer

Working with apps is not meant to replace the feel and sound of book pages turning, the sensation of applying a crayon to a piece of paper, or the satisfying crash of a tower of blocks smashing to the floor. Nor is it meant to substitute to face-to-face interaction with young children. Dr. Sally Rogers, a MIND Institute researcher at U.C. Davis Medical Center, explained that experiences shape babies' brains in a very physical way; if a baby focuses on objects more than on faces, babies can lose their ability to learn the emotional cues normally taught by watching facial expressions (Dembosky, 2010). Mobile technology, particularly tablet computers, is best utilized as a way to enhance early therapeutic intervention methods. Tablets offer convenience and portability while allowing immediate and inexpensive (or even free) access to a variety of engaging activities.

Also, SLPs can stress to parents that quality, not the quantity, of time that is powerful. The American Academy of Pediatrics (Glassy & Romano, 2007) encourages parents to limit video game and computer game use so that total screen time, including television and computer use, should be less than one to two hours per day. Children younger than 5 years should play with computer or video games only if the games are developmentally appropriate, and should be accompanied by a parent or caregiver for maximum benefit. Warren Buckleitner (n.d.) describes healthy ways to embrace technology by bringing balance into a child's media diet using a few sensible strategies, such as keeping devices out of a child's bedroom and setting "media-free" time, especially during meals.

Based on rapid and ongoing sales of mobile technology, specifically the tablet computers, the media's current focus on educational benefits of apps, and the increasing use of iPads in schools (Malone, 2011), SLPs who work with toddlers and families can lend their expertise as facilitators who model tablet use. However, Sandra Calvert explained how many people "are rushing to get content and it hasn't really been empirically tested...What we see is a lot of promise, and informal observations to suggest kids are very engaged" (Malone, 2011). Therefore, proceed with caution and wisdom, remembering that person-to-person interaction, individualized treatment goals, and tried-and-true therapy techniques, will always be more important than the latest tool on the market.

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Additional Resources

- ASHA's app resource
- White paper by the AAC-RERC on use of communication apps

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