



Current News:

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◆ Did you bring your 6-month-old to the lab to view videos of women speaking in infant-directed speech and making facial expressions?

⇒ *We have the results of those studies!*

In two separate experiments, infants' eye-tracking patterns for synchronous and desynchronous speech as well as happy and disgust facial expressions were assessed to examine the specific features of faces that infants attend to when viewing audiovisual and emotional facial stimuli. 71 six-month-old infants came to the lab for these experiments, thank you parents! Participants viewed videos as well as static images on an eye-tracker that measured looking location and duration. We are currently replicating these experiments with ten-month-olds to examine whether looking patterns change as a function of age.

◆ More information about these experiments and results can be found on page 5.

◆ *Infants' Eye-Tracking of Audiovisual Faces: Effects of Facial-Vocal Desynchrony* will be presented in poster format this May at the annual meeting of the Association for Psychological Science in New York City by Mariah Fowler.

◆ Priscilla Jacob presented results this semester in an Honors Thesis titled *Infants' Eye-Tracking of Static and Dynamic Facial Expressions*

Current Projects

1 visit to the lab
10-month-olds

We use eye-tracking to determine where babies look on the face when shown videos of adults speaking in infant-directed speech and making various facial expressions. This is a follow-up to our recent studies with 6-month-olds. Please contact us via phone or email (info on page 2) if you would like to participate!



Graduation Announcements

The Infant Learning Project would like to congratulate several students who are completing their undergraduate degrees this May. Sarah Rouhani is graduating with honors and a bachelors degree in Speech Language Pathology and a minor in Child Learning and Development. Sarah has been accepted to the Communication Disorders Masters Program at UT Dallas! Priscilla Jacob is graduating with honors and a double-major bachelors degree in Psychology and Child Learning and Development. Priscilla has been accepted to the Psychological Sciences Masters Program at UT Dallas! Ana Chavez is graduating with honors and a bachelors degree in Healthcare Studies. Sarah, Priscilla, and Ana's numerous contributions to the Infant Learning Project are deeply appreciated. We are so proud of our students and wish all success in future endeavors!

What's APPenning with Children and Tablets?

Written by: Sarah Rouhani

Although TVs have been around for a while, their prevalence and popularity has shown an increase during the 21st century. According to the U.S. Census, there are about 116 million homes that have at least one television (2011). Due to this high occurrence, we often find TVs interrupting meaningful and necessary familial interactions. Many parents attempt to use kids' programs to educate their children. Although this can be effective for older kids, excessive TV exposure can be damaging for younger children. Research has found that for very young children (under the age of two) there is no cognitive benefit of watching TV (American Academy of Pediatrics). Thus, programs like *Baby Einstein* provide deceitful and misleading advertisement (CCFC, 2007). A child is not going to become a genius by simply sitting and watching a screen. In order to effectively learn, young children need to use all of their senses to interact with their environment. TVs, unfortunately, do not provide this opportunity. Some technology does have the potential to provide learning opportunities, namely the tablet. There has been an upsurge of tablets in the past decade, and more households now own these new devices. Although the tablet's popularity trend does parallel that of the TV, there are still crucial distinctions between the two. Tablets allow for interaction and provide instant feedback where a television does not. This difference has caused many researchers to study the potential cognitive benefits of touch screen tablets, specifically with emergent literacy.

Emergent literacy skills are important precursors of future reading and writing ability. These skills include knowing the name of a letter and the sound that it makes, having phonological awareness (e.g. identifying rhyming words, knowing what sound a word begins with, breaking down the sounds that make up a word), practice with early writing and exposure to print (books, newspaper, magazines, etc.) (Neumann & Neumann, 2014). It is crucial for children to develop these skills at a young age so they can keep up and excel once beginning school. Tablets can serve as great supplemental tools for learning.

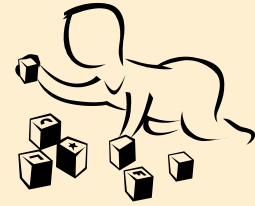


What's distinct about this new technology is that children can easily incorporate it into their playtime. For example, a child can have a virtual tea party on their tablet device while simultaneously playing with their toy tea set and teddy bear guests (Chiong & Schuler, 2010).

This incorporation is attributable to the tablet's mobility and light weight. In regards to emergent literacy skills, the tablet is unique because it resembles a book and can be used like a writing pad. Thus, many tablet apps are successful at developing emergent literacy skills. With the enormous amount of children's apps available, it is difficult to know which are most beneficial to emergent literacy. Researchers Michelle and David Neumann have identified the key features that successful literacy apps should have in their design: age appropriateness that correlates to the school's curriculum, high level of interactivity, constant building on previous knowledge, encouragement of creativity, problem solving, critical thinking, regular feedback, and guiding of the child's performance rather than concluding with a success or failure outcome (2014). Mentioned below are some fun and free apps that possess some of these features and could potentially help develop emergent literacy skills.

(Continued on page 3...)

Infant Learning



Project

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"Like" the **Infant Learning Project** on Facebook to receive weekly information about infant research, child development and parenting!

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- ◆ **iTrace-Handwriting for Kids:** The primary focus of this app is handwriting. The child can work on tracing letters, numbers, and even their own name! The app also provides different scenes, such as the beach or a circus, where the child can learn vocabulary words and practice tracing them. Additionally, parents can upload their own pictures with a corresponding name or label so their child can practice tracing names of familiar objects. If a child traces a letter incorrectly, the app demonstrates the finger movement for them again. Lastly, they record the child's writing history so that parents can go back and look at their improvement.
- ◆ **ABCs Alphabet Phonics & Montessori Learn to Read:** The primary focus of this app is rhyming, handwriting, and letter knowledge. The app features a game that has children match up pictures and objects that rhyme. It also features tracing of upper and lower case letters, as well as pictures to go with the sounds. If a child is having trouble tracing or getting the right answer, the app provides helpful hints to guide the child to the right answer.

- ◆ **Alphabet aquarium:** The primary focus of this app is letter recognition and sound knowledge. It goes over every letter, how to write it, the sound that it makes, and what objects start with that letter and sound. Children match sounds to pictures and play mini games that reinforce the letter's sound and shape.



- ◆ **Read Me Stories:** An eBook is a wonderful way to introduce a child to print concepts, letters, sounds, vocabulary, and all other aspects of emergent literacy. This app provides parents with a new book every day! When initially downloading the app, parents answer questions about their child so that their library is catered to them. The app gives you the option of having the books read out loud. While they read it to you, words are highlighted so the child can follow along. If a child gets stuck on a word while reading by themselves, they can simply click on the tricky word and the app will break it down and help them sound it out letter by letter.

There are several more applications that can support a child's emergent literacy skill development. Parents should be cautious of apps that are passively providing children knowledge, such as videos and TV shows, compared to ones that are actively engaging the child, interacting with them, and giving them feedback. It is also important to note that for a child to get the most out of an app, parents should be present and adding to their learning process. Some questions or comments to add while your child is engaging in the app's activity would be "What was that letter name again?", "Sound out the letter while you're tracing.", "What does the highlighted word mean?", "That's a picture of a beach. Can you tell me about when we went to the beach?", "Can you think of other words that start with this letter?". Lastly, for a well-rounded learning experience, children should also be exposed to books, pens and pencils, and human interaction.

For more information on tablet devices and emergent literacy skills, please refer to: <http://link.springer.com/article/10.1007/s10643-013-0608-3>

Thank You!

We would like to express our sincere gratitude to the parents of the infant participants in our studies.

Without you, our research would not be possible!



Dr. Kate Shepard earned her masters and doctoral degrees at the University of Texas at Dallas and conducted research at the Infant Learning Project. She is a speech-language pathologist and developmental psychologist who now owns a private practice in which she provides speech-language services to children in the North Dallas Area.

For more information, visit:

Shadow Me
Speech Therapy at
shadowmespeechtherapy.com



The Children & Infant Listening Lab (CHILL) is looking for 6-13 month old babies with normal hearing to listen to speech sounds.

Get a free hearing screening and \$20 for completing the 1-hour study!

FOR MORE INFORMATION about the CHILL study, contact

Dr. Andrea Warner-Czyz
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Microchimerism in the Human Female Brain and Its Effects

Written By: Madeeha Mian

The first physical connection between mother and child occurs during gestation through the placenta (Martone, 2012). Most agree that the link between mother and child is unique and irreplaceable. However, new research is indicating that this link is even stronger than once imagined. What is surprising is that fetal cells can *also* migrate through the placenta to tissues and organs in the mother's body, including the blood, bone marrow, skin, liver, heart, and the brain (Dawe et al., 2007). The idea that humans are autonomous individuals may not be entirely true. Foreign cells existing in the mother's body seem to suggest that many people carry remnants of other individuals within themselves. In fact, remarkable results from recent studies indicate that cells from other individuals are indeed part of our own bodies and brains. Fetal cells were discovered to be living in the brains of women, with many residing there for several decades (Dawe et al., 2007). There is also increasing evidence that these cells persist lifelong in many childbearing women (Dawe et al., 2007).

The idea that cells from others' bodies reside and function within our mind and body – where we consider that we control our own actions and decisions – may seem both strange and remarkable. However, this condition is not unusual, and is referred to as microchimerism: the presence of cells from genetically distinct organisms persistently living in another organism. It was first discovered when Y chromosomes were found to be circulating in the blood of

women who had been pregnant. These male cells could not have been the women's own, and most likely had come from their babies during pregnancy (Martone, 2012). Although microchimerism typically results from the exchange of cells across the placenta in pregnancy, research has shown that cells may also be transferred from the mother to the infant during pregnancy (Zhou et al., 2000). It is still unknown what microchimeric fetal cells do in the mother's body, but several possibilities have been hypothesized and researched.



One possibility is that fetal cells behave similarly to stem cells and may aid in tissue repair. To test this theory, a research group used green fluorescent protein to track the activity of fetal microchimeric cells in a mother rat after the heart was injured (Kara et al., 2012). They discovered that the fetal cells actually migrated to the maternal heart and differentiated into heart cells in order to help repair the injured heart. Cells transferred into the mother's body appeared to be a critical mechanism in the maternal response to cardiac damage (Kara et al., 2012). Fetal microchimerism was also investigated in the brain. Targeting the male Y chromosome¹, DNA from autopsied brains of healthy women and from women who had Alzheimer's disease was analyzed. It was found that 63% of the females (37 out of 59) tested positive for fetal microchimerism, present in multiple brain regions.

In addition, results indicated that there was both a lower prevalence and concentration of microchimerism in the brains of women with Alzheimer's disease in comparison to the brains of women without any neurological disease. Additionally, it is possible that microchimeric cells may help in preventing breast cancer. In a different study, researchers discovered that fetal cells in the blood and the breast tissue are associated with protection from breast cancer. 272 women participated, out of which 70% were microchimerism positive (Gadi, 2010). The presence of male DNA for the Y chromosome gene was determined by amplifying the DNA and then comparing the breast tissues containing fetal cells.

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**Center for
Children and Families**
The University of Texas at Dallas • School of Behavioral and Brain Sciences

Infant Development Program

The Infant Development Program (IDP) of the Center for Children and Families at the University of Texas at Dallas serves as a resource for the identification and prevention of developmental disorders for children ages 0-5. IDP offers comprehensive developmental screenings in both English and Spanish at various sites in greater Dallas.

For more information, contact
Cecilia Lazcano at 972-883-4503 or
cecilia.lazcano@utdallas.edu



Juega Conmigo

Juega Conmigo (Play with Me), is a program of weekly, free, drop-in, parent-child playtimes for children ages 0-3, started in the Bachman Lake Library. *Juega Conmigo* is designed to foster strong parent-child relationships and children's growth through semi-structured play sessions. In this informal environment, bilingual developmental specialists share information and facilitate play and learning activities using toys, music, and movement to promote sensitive, stimulating parent-child interactions and provide important supports for school readiness

For more information, contact 972-400-0286

Current Events at the Infant Learning Project

Experiment Results

(continued from page 1)

Infants' Eye-Tracking of Audiovisual Faces: Effects of Facial-Vocal Desynchrony:

Infants viewed videos of a woman producing either approving or comforting speech for which there was or was not synchrony between the face and voice. Analyses revealed that infants' looking at eyes and mouth did not differ significantly for synchronous messages, which is consistent with previous findings. However, looking patterns were disrupted for desynchronous messages. Infants looked significantly longer at mouths than eyes for comforting desynch. speech, but looked for similar times at eyes and mouths for approving desynchronous speech.

Increased scanning of mouths for desynch. comforting speech is consistent with prior findings indicating that infants look to specific moving facial features to gather information about emotion and speech. These results suggest that desynchrony between facial and vocal speech disrupts infants' typical facial scanning patterns of audiovisual speech and may have impacted infants' failure to categorize the communicative intent of desynchronized messages in previous studies.

Infants' Eye-Tracking of Static and Dynamic Facial Expressions: Infants viewed static or moving silent clips of women portraying happy and disgust expressions. The data revealed that infants did not change scanning patterns for moving vs. non-moving emotional faces; however babies looked significantly more at the eyes than at the mouth across all stimuli. These findings are consistent with previous studies finding that 6-month-olds attend more to the eyes when presented with facial stimuli without a speech component. In contrast, studies that have used video clips with a talking face have found that infants attend more to the mouth than eyes. After 6-months of age, infants begin to engage in babbling; it is theorized that they begin to look more at the mouth at this age in order to learn vocalizations by imitation.

In our study using visual-only faces, infants may have scanned the mouth and realized that the available speech information was limited. The attention to the eyes may indicate that infants were looking for social information rather than directing their attention to the mouth for speech information.

(Continued from page 4)



Breast tissue from the cancer-free women often harbored more microchimeric cells than tissue from women with breast cancer (63% and 26%, respectively), indicating the protective association of fetal microchimerism against breast cancer (Gadi, 2010). There is also the possibility that microchimeric cells may have a detrimental role in diseases. Although microchimerism can reduce the risk of breast cancer by one-third, it was also found to increase the risk for colon cancer 4-fold (Jorgensen et al, 2014). Nevertheless, a succeeding study indicated that there was greater chance of survival among women with breast or colon cancer who were microchimerism positive compared to microchimerism negative (Jorgensen, 2012).

Fetal cells have the remarkable ability to travel across to the placenta and into the mother to integrate with the mother's tissues and organs. Microchimerism is a lasting legacy left by the fetus to the mother and is a reminder of the strong connection between humans, especially between mother and child (Martone, 2012). Though there are still many unanswered questions about microchimerism, this field has incredible potential for research and new findings.

Spring 2015 Infant Learning Project Team

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