



# DEVELOPMENTS NEWSLETTER

Vanderbilt University . Peabody College  
Department of Psychology and Human Development

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**Welcome!** This is the first issue of Developments, Our goal is to share our research findings and our enthusiasm about our research with a broad audience of parents, colleagues, and students. We are a cohesive group of researchers pursuing related questions about child development.

What can parents and teachers do to provide optimal contexts for learning and development?

How does stress influence children's performance, both positively and negatively?

How do infants and young children understand and learn from others in their environment: Does

it matter if the other is a human or robot? Does it matter if the human is live or on television?

Do children learn better when an adult is listening to the child and/or prompting the child to compare examples or create explanations for complicated problems?

In this initial issue, we will describe each of our research labs, the general goals for each lab, and some recent research findings. In future issues, we will provide a more in-depth look at individual labs. Please contact us if our studies sound interesting to you!

## Language Development Lab

**General Topic of Study:** How do children learn words? Do children think that the minds of computers and robots have minds like people do? When do babies understand talk about absent things?

**Principal Investigator:** Dr. Meg Saylor

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**Team Members:** Maria Osina, Maria Vazquez, Lauren Krensky, Michelle Doscas, Kate Woods, Kyle Cortley, Jessica D'Angelo, Jade Wallace, Louise Hannallah, Bronwyn Backstrom, Dillon Adwar

**What's New?** We've studies whether babies understand adults' talk about absent things. We've discovered some surprising limits to young babies' skills. For example, 12 month-olds have some

difficulty understanding requests for hidden objects when the objects had previously appeared in a different room. In addition, they only figure out which of two absent things a person is asking for if researchers had previously labeled the objects with "my." Development happens fast here though; our other studies have shown that in just a few months infants overcome these early limitations. They can understand talk about a variety of absent things that have previously appeared in other places. Preschoolers in our recent studies have shown some very advanced skills! They are able to use a person's past ability to engage in a conversation to decide whether to learn words from that person. They are conservative in their judgments about properties that are shared between robots.

## Language Development Lab (continued)

### Recent Publications:

Saylor, M. M., Somanader, M., Levin, D. T., & Kawamura, K. (in press). Defying expectations: How do young children deal with hybrids of basic categories? *British Journal of Developmental Psychology*.

Saylor, M. M., Sabbagh, M. A., Fortuna, A. & Troseth, G. (2009). Preschoolers use speakers' preferences to learn words. *Cognitive Develop-*

*ment*, 5, 125-132.

Hespos, S., Saylor, M. M., & Grossman, S. (2009). Infants' ability to parse continuous action. *Developmental Psychology*, 45, 575-585.

Saylor, M.M., Ganea, P., Vazquez, M. (in press). What's mine is mine: Twelve-month-olds use possessive pronouns to identify referents. *Developmental Science*.

## Emotional Development Lab

**General Topic of Study:** Link between emotion and speech/language disfluencies

**Principal Investigator/s:** Dr. Tedra Walden and Dr. Edward Conture

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**Team Members:** Ellen Kelly, Carl Frankel, Brian Verdine, Robin Jones, Dahye Choi, Katarina Ntourou, Chagit Clark, Jack Henderson

**General Topic of Study:** Processes of children's early emotional development and how emotion affects adaptive functioning.

**What's New?** Most of our projects look at ways in which children acquire emotions, express them in social contexts, and regulate emotional arousal. Frequently we work with children who have disabilities such as autism or stuttering. For example, in the Developmental Stuttering Project we look at the links between emotion and speech/language disfluencies. Stuttering affects about 5% of all individuals, with about 3 times more boys than girls. We have found a link between preschool children's emotional arousal and their ability to regulate their emotions with speech disfluencies such as stuttering. Children who stutter are more likely to become strongly emotionally

aroused and are poorer at regulating their emotion. Physiological measures such as skin conductance, heart rate and vagal tone supplement behavioral measures of observed emotion and confirm this effect.

### Recent Publications:

Johnson, K. Walden, T., Conture, E., & Karrass, J. (2010) Spontaneous regulation of emotions in preschool children who stutter Preliminary findings. *Journal of Speech, Language, Hearing Research*, 53, 1-18.

Yoder, P., Stone, W., Walden, T., & Malesa, E. (2009). Predicting social impairment and ASD diagnosis in younger siblings of children with autism spectrum disorder. *Journal of Autism and Developmental Disorders*, 39, 1381-1391.

Kim, G., Walden, T. & Knieps, L. (2010) Impact and characteristics of positive and fearful emotional messages during infant social references, *Infant Behavior and Development*, 33, 189-195.



## Early Development Lab

**General Topic of Study:** Children’s symbolic understanding—specifically learning from television & videos

**Principal Investigator:** Dr. Georgene L. Troseth,

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**What’s New:** We recently conducted a study looking at the visual preferences of children with autism spectrum disorder and typical development for an interactive-style video or a real person. Children were presented with a 5-minute video (based on Dora the Explorer) in which a female adult asked questions about toy animals, sang songs, and attempted to interact with children. Simultaneously, the adult appeared in a TV-sized opening next to the TV, engaging in the same behaviors “live”.

Typically developing children spent a higher proportion of time watching the real person than the video. Children with autism displayed substantial variability in their preference. On average, the lower his sociability score on the Vineland Adaptive Behavior Scales, the more he preferred the video over the person. These results suggest that video may be especially helpful for teaching children with less advanced social skills.

### Recent Publications:

DeLoache, J.S., Chiiong, C., Vanderborcht, M., Sherman, K., Islan, N., Troseth, G.L., Strouse, G.A., O’Doherty, K. (in press—online version Sept. 20, 2010). Do babies learn from baby media? *Psychological Science*.

O’Doherty, K., Troseth, G.L., Shimpi, P., Goldenberg, E., Akhtar, N. & Saylor, M.M. (in press). Third-party social interaction and word learning from video. *Child Development*.

## Educational Cognitive Neuroscience Lab

**General Topic of Study:** What’s changing in children’s brain as they gain new skills through education? What are the most important brain differences that make such learning easy or hard?

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**What’s New?** How can one predict how well each individual child will fare in a particular educational intervention, such as those designed for reading difficulties? Although pre-intervention behavioral measures provide some small amount of information, we have recently discovered that

## Educational Cognitive Neuroscience Lab (continued)

pre-intervention brain measures are better predictors of each child's outcome. Furthermore, we recently found that the specific way students pay attention to language sounds has a large effect on brain activity in the left hemisphere, and this can impact the way brain networks change as students learn to read a new writing system.

We are exploring similar education effects on the brain in early math learning in kindergarten through 3rd grade. We are also exploring how children's ability to pay attention changes with early schooling, and we're tracing out how these changes play out as the level of brain circuitry.

### Recent Publications:

McCandliss, B.D. (2010) Educational neuro-

science: the early years. *Proceedings of the National Academy of Sciences of the United States of America*, 107, 8049-8050.

Hoefl, F, McCandliss et al., (in press). *Neural Systems Predicting Long-Term Outcome in Dyslexia Proceedings of the National Academy of Sciences of the United States of America*.

Yoncheva, Y.N., Zevin, J.D., Maurer, U., & McCandliss, B.D. (2010) Auditory selective attention to speech modulates activity in the visual word form area. *Cerebral Cortex*, 20(3), 622-632.

Yoncheva, Y.N., Blau, V.C., Maurer, U., \* McCandliss, B.D. (2010) Attentional focus during learning impacts N170 ERP responses to an artificial script. *Developmental Neuropsychology*. 35(4), 423-445.

## Family-School Partnership Lab

**General Topic of Study:** Parental involvement in students' education, pre-kindergarten through secondary

**Principal Investigator:** Dr. Kathy Hoover-Dempsey

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**Team Members :** Manya Whitaker, Joan Walker and Christa Green Ice

**What's New?** We are working on understanding parents' motivations for becoming actively involved in supporting their child's learning. What do parents learn through this involvement and what do their children learn?

For example, Walker et al. (in press; below) examined the ability of our theoretical model of the parental involvement process to predict Latino parents' involvement in their children's schooling. Results for a sample of Latino parents (n=147) of 1st through 6th grade public school students offered support for our model's predictions. Parents' reports of home-based involvement had to do with whether their child seemed to want help and whether the parent thought they would be effective. Parents' school-based involvement had to do with whether they felt welcome at school and whether they had the time and energy to help at school.

## Family-Partnership Lab (continued)

Overall findings suggested that these parents were actively engaged in supporting their children's learning, a finding that contradicts several earlier deficit-oriented reports of Latino parents' attitudes and behaviors regarding involvement. This supports several ethnographic examinations of Latino parents' beliefs and behaviors regarding their involvement in their children's schooling.

### Recent Publications:

Hoover-Dempsey, K.V., & Whitaker, M.C. (2010). The parental involvement process: Implications for literacy development (pp. 53-82). In K. Dun-

smore & D. Fisher (Eds.), *Bringing literacy home*, Newark, DE: International Reading Association.

Hoover-Dempsey, K.V., Whitaker, M.C., & Ice, C.L. (2010). Motivation and commitment to family-school partnerships (pp. 30-60). In S.L. Christenson & A.L. Reschly (Eds.), *Handbook of school-family partnerships*. New York: Routledge/Taylor & Francis.

Walker, J.M.T., Ice, C., Hoover-Dempsey, K.V. & Sandler, H.M. (in press). Latino parents' motivations for involvement in their children's schooling: An exploratory study. *Elementary School Journal*.

## Infant Health and Cognition Lab

**General Topic of Studies:** Cognitive control in infants with and without risks for atypical development.

**Principal Investigator:** Dr. Julia Noland,

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**Team Member:** Amber Vinson, Jennifer Parker, Caroline Plaine, Nikita Rodrigues

**What's New?** A grant from Autism Speaks led to a novel finding by our lab: infant siblings of children with autistic spectrum disorders are more accurate in keeping track of the location of hidden toys (i.e. non-social working memory) than comparison infants. The two groups were not different in keeping track of hidden people, as the girl in this picture below is doing. We are grateful to the families whose participation in this study led to the finding of a new piece in the puzzle of family risk for Autism. It fits with a growing body of

literature suggesting family members of children with Autism might be more systematic when processing information about objects.

### Recent Publications:

Noland, J.S., Reznick, J.S., Stone, W.L., Walden, T., Sheridan, E.H. (2010). Better working memory for non-social targets in infant siblings of children with Autism Spectrum Disorder. *Developmental Science*, 13 (1) 244-251.

Noland, J. S. (2008). Executive functioning demands of the Object Retrieval task for 8-month-old infants. *Child Neuropsychology*, 14, 6. 504-509.

Noland, J. S. (2007). It is not just about location: Infants persevere to container shape during object search. *Infancy*, 3. 295-303.



## Infant Learning Lab

**General Topic of Study:** Perceptual-motor learning in infancy

**Principal Investigator:** Dr. Amy Needham

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**Team Members:** Jen Norvell, Gabrielle Strouse, Ariel Borten, Jane Hirtle, Michelle Feldman, Yuri Gandy, Jessie Rodriguez, Hilari Schaefer, Erin Sadler, Sara Greenberg

**What's New?** In the Infant Learning Lab, our main goals are to understand the factors that help infants learn during the first two years of life. We focus on infants' perceptual-motor learning— how infants learn from their own actions. We study infants' learning about their own abilities as they begin reaching for objects on their own, and their learning about tools such as spoons and key rings.

We have recently discovered that when infants have success reaching for objects using sticky mittens, (mittens that allow babies to pick up objects), they start their own inde-

pendent reaching earlier than they would otherwise. This finding suggests that infants learn from their reaching successes and that motor milestones are more flexible than was previously believed.

### Recent publications:

Kaufman, J., Needham, A. (in press). Spatial expectations of young human Infants following passive movement. *Developmental Psychobiology*.

Libertus, K. & Needham, A. (in press). Teach to reach: The effects of active versus passive reaching experiences on actions and perception. *Vision Research*. Special issue on perception and action.

Kaufman, J., & Needham, A. (2010). The role of surface discontinuity and shape in 4-month-old infants' object segregation. *Visual Cognition*, 18, 751-766.



## Children's Learning Lab

**General Topic of Studies:** How children learn math.

**Principal Investigator:** Bethany Rittle-Johnson, Ph.D.

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**Team Members:** Dr. Marci DeCaro, Kelley

Durkin, Katie McEldoon, Emily Fyfe, Laura McLean

**What's New?** Most of our projects investigate how children learn math from pre-K to middle school. They are funded by the National Science Foundation.

## Children's Learning Lab (continued)

Many of our projects focus on algebraic thinking. For example, in our recently completed study of children's understanding of the equal sign, we found that 2nd to 4th grade students, who first explored solving problems before the key ideas were explained, understood those ideas better than students who solved the problems after the ideas were explained. Opportunities to first explore in a new domain may help students understand their teacher's explanations more deeply. A related study is looking at the benefits of prompting students to explain their reasoning versus working through more practice problems, while controlling for the amount of time spent working on the math problems. Data analysis is currently underway

We are also interested in algebraic ideas that can emerge in preschool. For example, we did a study with 4-year-olds learning about patterns, such as

◆◆◆◆ where we are encouraging children to explain the underlying patterns to themselves or to their moms. Explaining to their moms helped. We are interested in exploring how instruction on patterns might be integrated with prompts to explain.

Finally, we are interested in helping children gain a better understanding of decimal numbers. Preliminary analyses indicate that students may learn the most from studying correct and incorrect examples of decimal problems and completing practice problems. Data collection will be finished this fall.

**Recent Publications:** Rittle-Johnson, B., Star, J. & Durkin, K. (2009). The importance of prior knowledge when comparing examples: Influences on conceptual and procedural knowledge of equation solving. *Journal of Educational Psychology*, 101(4),836-852.

Matthews, P.G. & Rittle-Johnson, B. (2009). In pursuit of knowledge: Comparing self-explanations, concepts, and procedures as pedagogical tools. *Journal of Experimental Child Psychology*, 104, 1-21.

Rittle-Johnson, B, Saylor, M. & Swygart, K. (2009). Learning from explaining: Does it matter if mom is listening? *Journal of Experimental Child Psychology*. 100(3),215-224.



Thank you for your interest in our research! To the parents whose children have contributed to our studies: thank you so much for your help! Our studies are completely dependent on your generous contributions of time and effort! We hope to continue our partnership with you and our scientific colleagues to study new ideas about the factors that influence development.