This is the final in a series of activities, sharing the latest information on the earliest years, during the Gesell Institute of Child Development’s Year of Advocacy in commemoration of the Institute’s 65th Anniversary.

Neither scientists nor educators are ready to prescribe MRI informed practices for improving learning in individual children. However, new research does demand that we take seriously how this new knowledge of the developing brain can better inform and influence policy and practice, and ultimately the development and learning of all children; especially those facing adversity.

In March 2016, Zero to Three presented a Journal Author Spotlight Seminar featuring Dr. Ross Thompson. In this seminar, Dr. Thompson reviews findings presented in the article What More Has Been Learned? The Science of Early Childhood Development Since Neurons to Neighborhoods, published in January 2016. In the 15 years since the publication of From Neurons to Neighborhoods, scientists have learned a lot more about the developing brain, the growth of thinking and learning, the effects of early stress, and the importance of relationships to young children’s development. Dr. Thompson outlined these advances, especially as they are reflected in the 2016 report Transforming the Workforce for Children Birth Through Age 8, and considered their implications for practitioners and policymakers.

In summary, what we now know about early brain development is:

1. We knew it was early, but we didn’t know it was that early. Learning is rapid and cumulative and begins earlier than we thought.
• The first three years are even more important for lifelong success than even From Neurons to Neighborhoods had predicted. In particular, the foundations for language development are set in these early years as infants pay attention to patterns in sounds.

• In 1995, Hart and Risley, in Meaningful Differences in the Everyday Experience of Young American Children, found marked disparities between the sheer number of words spoken as well as the types of messages conveyed. After four years these differences in parent-child interactions produced significant discrepancies in not only children’s knowledge, but also their skills and experiences, with children from high-income families being exposed to 30 million more words than children from families on welfare. In 2013, Fernald, Marchman and Weisleder found evidence that this language gap between rich and poor children begins in infancy. By 18 months of age, toddlers from disadvantaged families are already several months behind more advantaged children in language proficiency.

2. It’s not (just) about the words.

• Child directed speech is the game changer. More than just words, it’s the higher pitched, melodic, emotionally charged tones found around the globe that make the difference. Words spoken in adult to adult interactions are less impactful. In 2013, Weisleder & Fernald found that the amount of child directed speech by adults to infants was associated with their vocabulary size at 2 years old.

• Parents’ spontaneous “number talk” from 14 to 30 months is associated with children’s number knowledge at 46 months. (Levine, Suriyakham, Rose, Huttenlocher & Gunderson, 2010).

• Learning is more than cognitive skills. It includes:
  (a) executive function skills and competencies, like inhibition, mental flexibility and working memory, that help children acquire further understanding,
  (b) socio-emotional development that supports emotional well-being, and
  (c) physical development and health.

3. It’s not (all) about me.

• The thinking of infants and toddlers is less egocentric and far more inquisitive and conceptual than traditionally believed. Using child-directed language
when interacting with infants by labeling, putting into words what people are feeling or objects and doing and narrating the child’s ongoing experience of discovery and problem-solving are ways that adults can inspire early cognitive growth. In Transforming the Workforce for Children Birth Through Age 8, it states that the back and forth (or serve and return) interactions of child and adult provide stimulus for metacognition and a bedrock for future social interactions.

• The skills and competencies essential to early learning develop in a relational context. In From Neurons to Neighborhoods it was already clear that nurturing relationships are the “active ingredients” of learning and healthy development. Now we also recognize that high quality, positive learning environments are also important to enable adults to develop secure, responsive relationships with children, and to provide support to the adults who work in these settings.

• Purposeful play based curriculums are not entirely “hands off.” Optimal learning occurs with the assistance of a caring and consistent caregiver.

• Chronic stress impedes learning and development. The biological impact of stress, trauma and living in adversity help to account for immediate and long-term behavioral effects.

• From Neurons to Neighborhoods said no to the oversimplified Nature vs. Nurture. Today, scientific advances in understanding “gene-environment interplay” underscore how inextricable the influences of genetics and environments are. Environmental conditions can, in fact, alter gene expression.

We find that some of this new research must change how we teach children, including the fact that early learning begins even earlier than we thought. However, some research importantly confirms what we already knew, such as the importance of relationships. When reviewing the latest and best research on infant brain development, it is striking how, at times, new findings are bringing us back to old school methods and meaning.

For example, supportive brain science on the importance of play confirms what we’ve known all along: play is essential work for young minds. This understanding informed the writing of “Pretend Play and Brain Growth: The Link to Learning and Academic Success.” After exploring the definitions and theories of play, it examines the relevant brain research, and explains the long-term benefits of pretend
play on executive function. Early care and education professionals knew this long before we were able to get up close and personal with the mechanisms of the young brain.

In a recent *Atlantic* article, "The Underestimation of America’s Preschool Teachers," author Lillian Mongeau quotes Marcy Whitebook, director of the Center for the Study of Child Care Employment: "Existing brain science backs up what educators could only theorize in the 1970s: The first five years of a child’s life are key to their overall brain development. What children learn before age five—both academic skills like critical thinking and social skills like taking turns—sets the stage for the rest of their lives."

The single most important element in capitalizing on that crucial window, Whitebook adds, is who provides education in those years. "People don’t tend to think teaching young children [is] as complex work as teaching older children, but in fact, it is. It’s hard for people to see that because of the nature of young children and because we have a historical approach that anybody can do it."

The "professionalization" of early childhood education is an ongoing challenge for both practitioners and policy makers. Salaries still fall short to account for the overwhelming importance of the function early educators perform for our society. Fortunately, in review of what neuroscience has to teach the policy and practice of child development, the importance of the early years and the need for high quality early care and education is now undeniable.