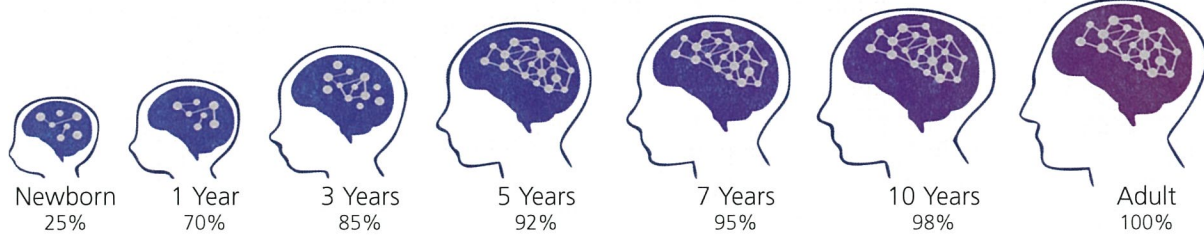


Why Early Childhood Education Matters: The Science of Brain Development.



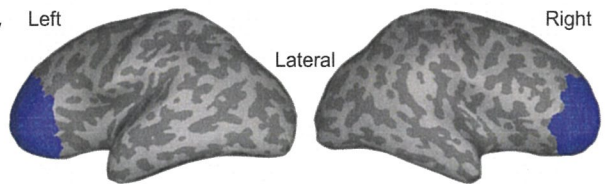
Early brain development is the result of experience

- By the end of their first year of life, a baby's brain is already 70% the size of an adult brain. Our earliest experiences shape the connections rapidly forming in the developing brain (Gray's Clinical Neuroanatomy, 2010).
- Infant brains rehearse activation patterns and start forming connections, like the coordination between the listening and speaking areas of the brain, even before children begin to talk (Imada et al, 2006).

Bilingual and Brilliant

What is happening in the brain of bilingual babies?

- Babies easily learn two languages at once and there is no evidence that learning two languages causes language learning delay. In fact, studies show that children learning two languages have a longer sensitive period – this means they have a wider window to learn languages easily (Garcia-Sierra et al., 2011).
- Infants learning two languages show increased activity in the prefrontal cortex and orbitofrontal cortex, two areas of the brain related to executive function skills. Learning two languages gives the brain an extra workout, resulting in a boost in skills like switching between tasks, memory, and flexible thinking (Ferjan Ramirez et al. 2017).



Brain Building: The Ingredients of High Quality Interactions



- Children learn best from live, back-and-forth interactions (Kuhl et al., 2003; Goldstein & Schwade, 2008).
- Social cues such as eye-gaze and pointing, and social interactions like imitation support children's learning ((Brooks & Meltzoff, 2002; Meltzoff, 1988).
- In addition to the quantity of language, the quality of language a child hears influences their language development (Kuhl, 1983).
- Programs that incorporate highly social, back-and-forth interactions, put an emphasis on language rich environments, and are play-based yield learning gains (Ferjan Ramirez & Kuhl 2017).

Early Learning Sets the Stage

Early predictors of school readiness:

- Following a speaker's eye gaze and using pointing gestures predicts children's vocabulary at 2 years of age (Brooks & Meltzoff, 2008).
- Becoming attuned to native speech sounds in the first year predicts language at 24- and 30-months of age, and may even link to reading readiness at age 5 (Kuhl et al., 2005; Lebedeva et al., 2010).
- How well young children do on tasks that require executive function skills predicts growth in all academic outcomes (McClelland et al., 2014).

