



Language is the key to learning! Language is the key to reading! Language is the key to cognition, stated Dr. Catherine Snow, in *Time to Act*. Harvard University, (2010). (1)
The basis of learning, comprehension and reading is LANGUAGE! Researchers worldwide agree that language is a foundation on which learning resides. New neuroscience research illustrates that multiple language learning at any age advantages the learner. The ability to problem-solve, multi-task, focus attention and prioritize are enhanced by learning multiple languages. The question is how? What is the most effective way to develop language/s?

K-12 Education is inundated with technology for every purpose imaginable. Tech education marketers hawk the newest program or product promising students will learn math through games, reading through phonics audio downloads and **multiple languages** by accessing apps which feature kids' language programs on tablets, iPads and television screens. Advertising is relentless and access is ubiquitous. BUT does technology enhance multiple language learning?

Recent Education Neuroscience provides key insights into these questions and illuminates deeper foundational aspects of language/s learning and cognition heretofore unavailable.

Babies are born universal linguists. They acquire specific neural connections for language the last 10 weeks of gestation and enter the world hearing every sound in every language spoken. (2)



WHAT

Using specialized fMRI's or brain imaging equipment, researchers discovered that babies begin distinguishing language/s by head turning toward mom's voice at 3-6 months old. This is the natural neural developmental process for any child regardless of race, ethnicity, income level, culture, country or language/s spoken. When more than one language is spoken in the home, infants easily recognize language differences and are not

confused. They respond to the specific language spoken by each individual when speech sounds, words and patterns in each language are clearly articulated. Additionally, learning multiple languages simultaneously does NOT inhibit the development of either. (3) In fact, *demonstrated achievement results illustrate that students proficient in two languages outperform any other student group in 3rd grade reading.* (4)

HOW

How does the brain acquire language/s best? Neuroscientists conducted in-depth studies to determine if technology using adult speech articulation on a computer screen or computer-generated language programs is preferable to acquiring languages through simple in-person human interaction. Empirical findings revealed that babies learning language/s by interacting with human faces on computer screens show ZERO% cognitive activity in the brain or NO learning, whereas, children who were held and had interactive, in-person facetime language exchanges, increased language development and cognition 700%. (5)



Ongoing studies indicate that either one-to-one or small group in-person human interaction is fundamental to language/s development regardless of the learners' **age**, background or culture.



When is the optimum time to introduce technology during a learner's language/s development?

Technology used to **support** and **supplement** explicit language instruction is effective when the learner is about 8 years old or in 2nd or 3rd grade.



SCREEN TIME --- LESS IS MORE

Finally, several fMRI studies focused on the impact and effectiveness of children's TV programming. The results are astounding. The only television programs that have a positive long-term effect on children's learning in general and language learning specifically are Sesame Street, Blues Clues, Clifford and Dora the Explorer. (6)



WHY QUALITY COUNTS:

Language is fundamental to learning, and acquiring multiple languages increases cognition and academic success. Therefore, educators grounded in neuroscience's language/s acquisition 'theory to practice' research and instructional strategies must lead the way. Research illustrates that languages are best acquired through direct, explicit, one-to-one interaction with parents, caregivers and teachers during the initial language learning process. Supplemental technology support is effective when introduced later. Regardless of program approach, time in program or the newest technological advances; it's quality interactive in-person instruction that counts!

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Published in final edited form as: Neuron. 2010 Sep 9; 67(5): 692–701.