

# Advanced Thinking Made Easy

By Horacio Sanchez

The way children learn to talk remains the same no matter what age they are or when they begin to learn a language. This was the revolutionary finding of Harvard neuroscientist Jesse Snedeker, Joy Geren and Carissa L. Shafto.

In the 20<sup>th</sup> century it was believed that children learn to talk by copying what they hear. The “copycat” theory cannot explain why toddlers are not partially fluent. If you listen to adults talk they do not often model one-word sentences: “beer”, “TV”, “remote”. Not unless we are talking about a male adult during football season.

In the past half century scientist have developed additional theories about how children learn language. The most popular one is the “mental development hypothesis”, which states that speech matches brain development much like a child must physically develop crawling before he or she is able to walk. The theory states that babies’ brains are not developed enough to handle complex speech until their brains are ready. A huge hole was blown in this theory when Snedeker, Geren, and Shafto looked at 27 children



ages two to five from China who were adopted by parents in the United States. Since these children were older when they began to learn English their stage of brain development would allow them to produce more fluent speech more quickly. However, these 27 orphans still began with single words, dropping word endings, and not congregating verbs. They still went through the same language stages as a typical American born child. The Harvard neuroscientist concluded that baby talk is not a product of a less developed brain, but rather a lack of knowing a sufficient number of words.

This finding challenges the dated concept that age alone should determine what children are capable of learning. Two recent reports from the National Research Council indicated that children learn best when they regularly revisit topic moving from basic to sophisticated. This indicates that base understanding should be somewhat automated before individuals can engage in more advanced thinking. In order words, more complex sentences, grammar, and even creative expression can be produce at a younger age by children who have a larger number of words and if their word knowledge is automated. The research of Roy F. Baumeister showed that the brain is not good at multitasking. When humans are forced to do two things that require focus, both tasks will suffer. However, if one thing has been done repeatedly that it is almost automated, then the brain can do the other task to a greater level of efficiency. The implication is that if a child is struggling to think of words, he or she cannot syntax and created expression.

This builds sense if one considers how the brain naturally learns. Repetition of any task improves the quality of the connections creating more automated function. Also, the brain learns by association, connecting new information with what is already learned. More advanced thinking is merely a function of the brain having enough information to begin to make advance associations.



Let look at the implications of these findings on the ever shifting extremes of education. There was a time that children use to learn certain facts at each grade level. These facts were drilled and became automated. Then someone made the observation that rouge memorization is not advanced thinking and that should be the goal of education. These caused an extreme shift caused schools not to focus on vocabulary building, spelling, and times tables for higher thinking. We started teaching first graders to write freely, not to worry about spelling or punctuation, in hopes of creating the next Robert

Frost - *Although the new Robert Frost would have a limited vocabulary and could not spell or write legible.* Both approaches were flawed. Children need age appropriate knowledge that has become automated, but if schools just engage in rouge memorization we don't help the brain make sophisticated associations. However, if we focus on advanced thinking and don't teach any foundational information, advanced thinking cannot occur.

So what is advanced thinking, principal and concepts that children should be able to comprehend based of the core set of information that has been taught to a level of automation. This is what teachers see deal with every day. Some students come form environments in which age appropriate information is taught and utilized with great regularity. These students are capable of advanced thinking because their brains can comprehend based on prior knowledge and make associations because the required information is present. Student from deprived backgrounds cannot comprehend the same things because there is not sufficient prior knowledge to gain comprehension much less move on to higher level thinking.

So maybe this time the answer is in the middle and not in the extremes. Each subject matter must identify core knowledge that must be automated and drill it until ALL students possess this foundation. Then identify what are age appropriate advanced concept that can be obtained from this information. The National Research Council determined that a simple concept or principle introduced early results in greater advanced thinking in the future. Genius is nothing more learning more stuff and making more connections and advancing the learning and connections until one day you go – “I got it!”.