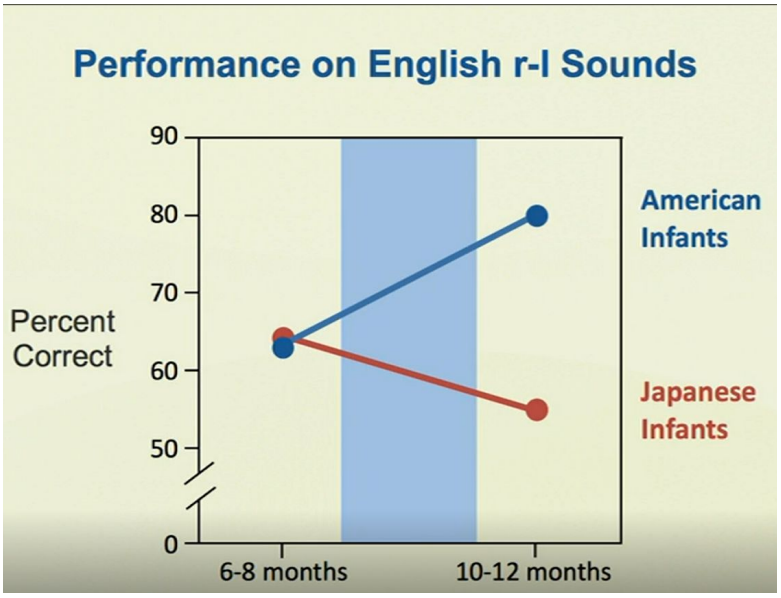
Tejesh Vaish

Assignment -3

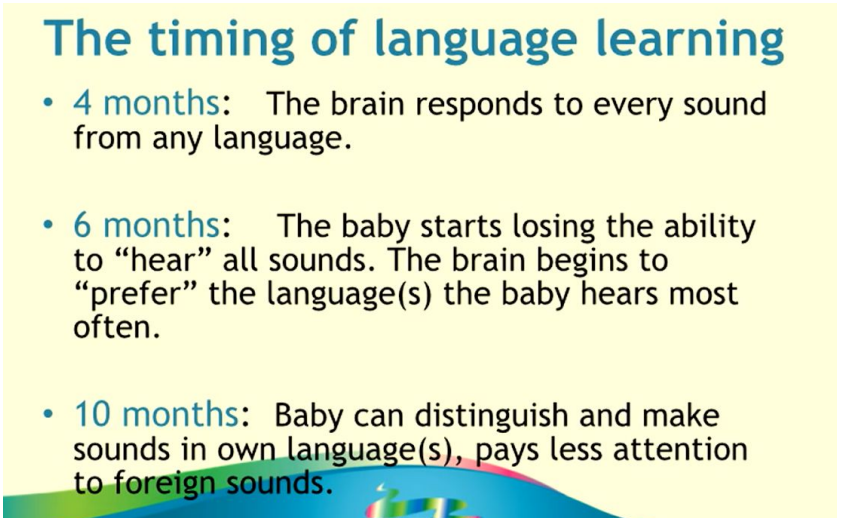
Based on what **you** have learned in the course so far, **comment** on whether **language acquisition** is primarily a matter of **'nature'** or **'nurture'**. Please use **evidence-based arguments** to support your answers.

You may use material from the reference **books** as well as any **journal articles** that you may have read, after citing them in the "References".

Babies up to 6-month-old are citizens of the world. They can distinguish between every sound of every language, no matter what country we are testing and what language we are using!
And that's remarkable, cause you and I can't do that! We are culture-bound people.
Now from this, another interesting question arises, that when do those cosmic citizens of the world becomes the citizen of one specific country?
The answer is **before their 1st birthday.**



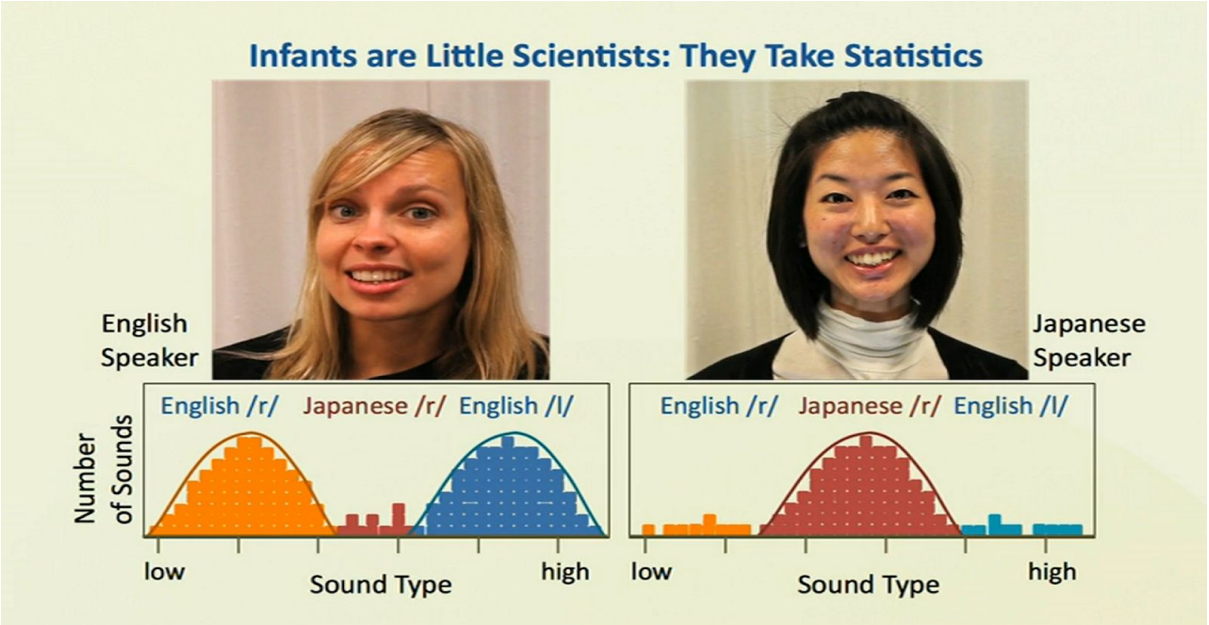
This picture is of performance of babies tested on **head turn** task performed on the babies in America and Tokyo.
Blue portion is transition period!



At 6-8th months babies are equivalent; two months later, something incredible occurs!

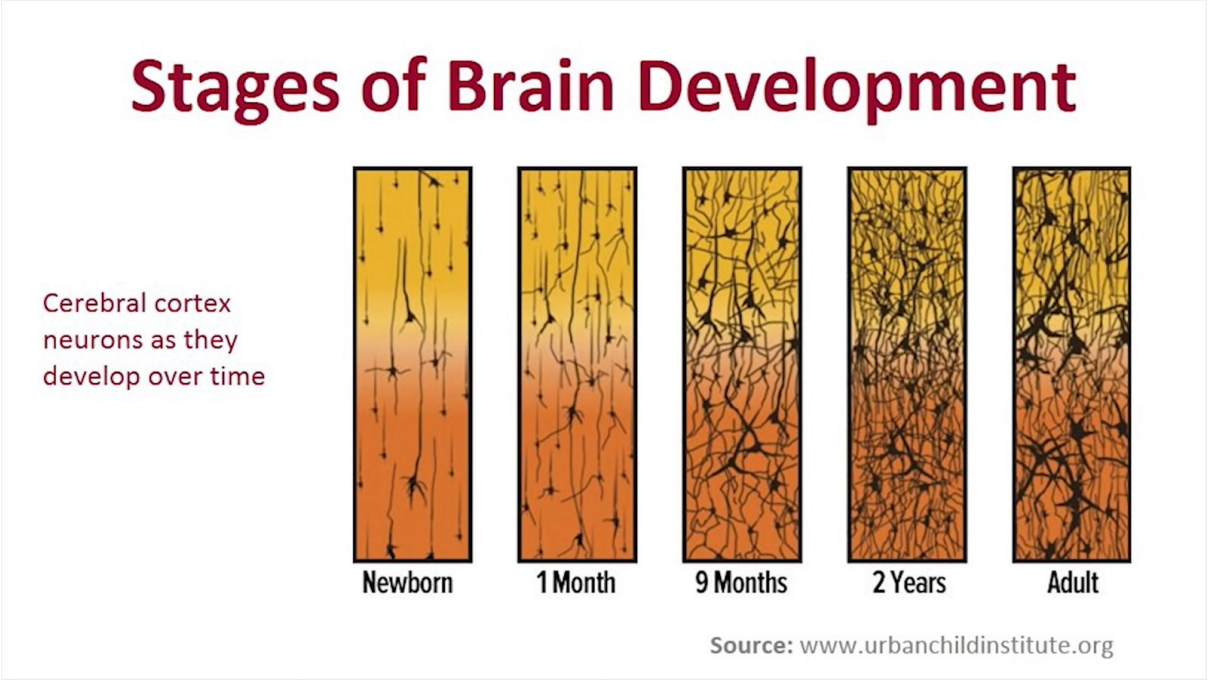
The babies of the United States are getting much better, and the babies of Tokyo are getting a lot worse in differentiating between the English alphabets!
What's the reason for this? When both types of babies are going to learn English in school.
There seem to be two critical factors, firstly that babies are taking **statistics** on speaker!

This picture on the left summarises that babies are born curious and statisticians, they have this innate ability to observe and imitate based on little information that they have got in front of them.
That's one of the reasons why Japanese babies performance declined, cause they most of the time listened to their parents speaking in Japanese and the English babies improved cause their **statistical** data hinted on learning the more words in English!



Babies take statistics on what we speak to them.
Then they Assimilate the statistics of the conversation, and it changes their brain, it changes them from the cosmic citizens to the culture-bound citizens as we are!

The below picture proves that we are born as an **almost** blank slate (I will talk about why I said almost).



As the babies are born, hundreds of billions of neuron are waiting to form new connections as can be seen in the above figure, that's the reason, that babies learn so fast and acquire language so effortlessly!

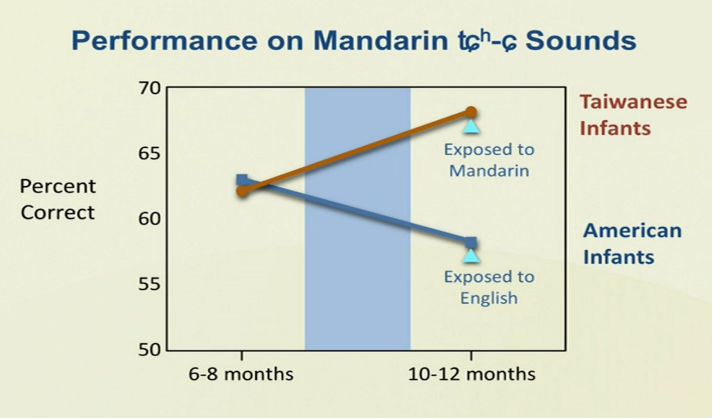
As the babies grow, they acquire language just like any other skill like walking, moving their hands, etc.

Our brain is magnificent; it carries the ability to learn anything!

Babies are like new PCs, unused and ready to install anything we want! As we use it, it can still install any other software, but the first software which gets installed on it, define the primary functions of the PC :p

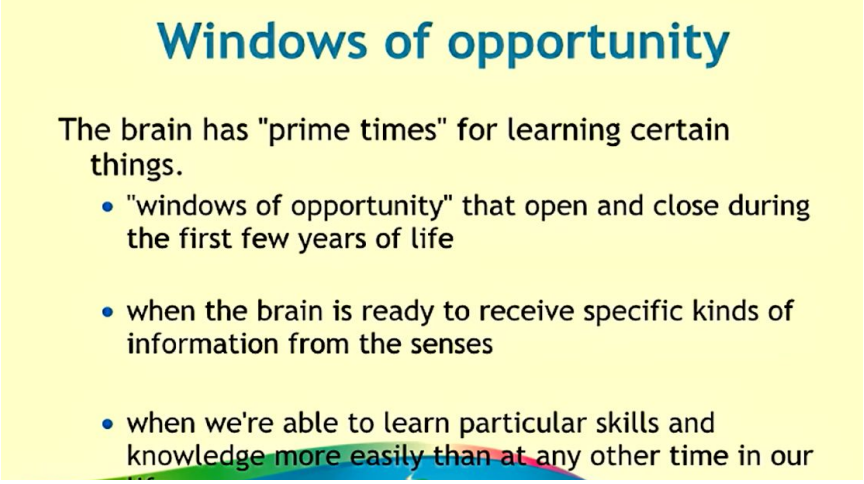
Coming back to the last example, We as adults are no longer absorbing those statistics, our brain is already so full of neural connections, it has already installed so much software on it, that it becomes a necessity for it to stop giving attention to every pretty little thing!
We are governed by the early developments that we have gone through in our past.

When the mandarin babies are exposed to English, and English babies were presented to mandarin language, they both spontaneously took over that language just like any baby would have!



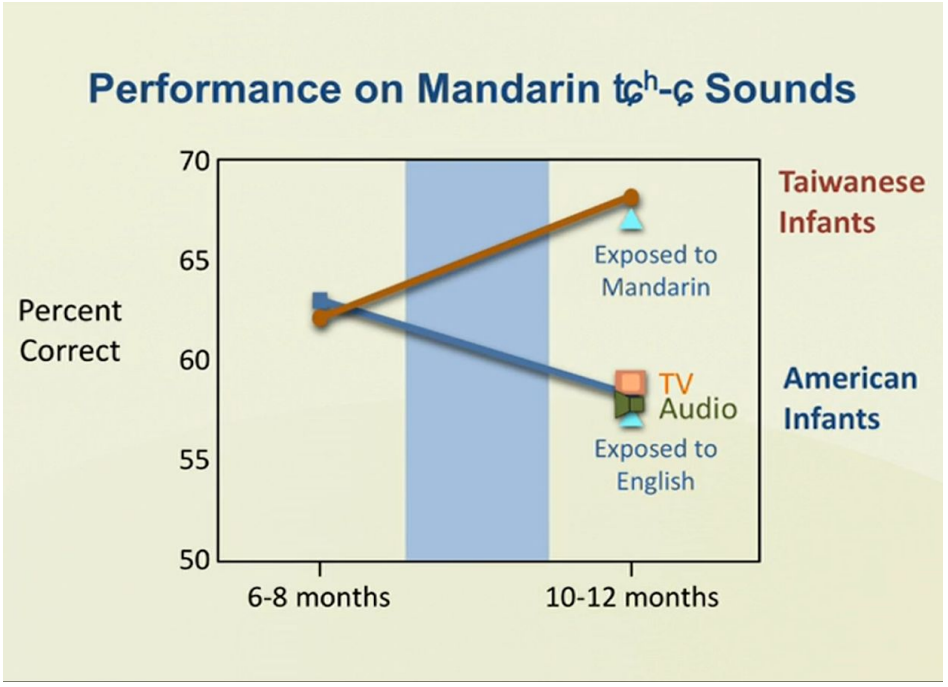
In this picture, the English babies are being taught mandarin by their relative during the critical period (6-10 months).

What have we done to their little brain :p in these experiments.
In this picture is the result of the experiment, which concluded that babies could learn any language of their choice; they don't have to be born to English parents to learn English quickly. It's just the statistics that are given to them during their first 1000 days, more importantly, in the 180-250th day.



Whatever we put in front of babies, they take statistics on.

The role of the human being is **vital** in this, to prove this, let's run another example, in which the babies are taught mandarin via radio and television, and then they are tested after a month on the head turn test.



The experimental findings are shown in this picture.

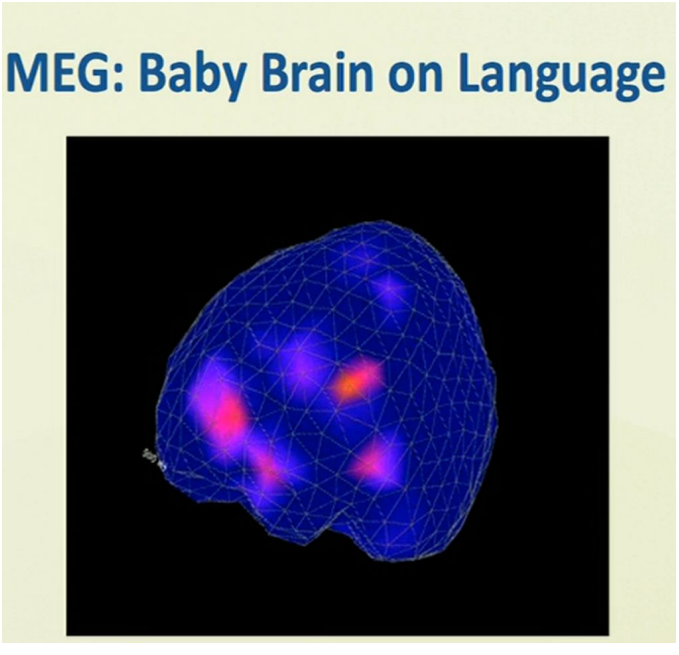
Those babies didn't acquire any bit of mandarin whatsoever.
It takes a human being for a baby to take its statistics.

Let me show you one the babies(below) we are talking about :p

Where does our focus first go when we first see this picture, Most probably his eyes and the lovely soft skin which we love to touch ^_^
What we are naturally drawn to, is his eyes and skin I will focus on what we cannot see, the story behind his learning capabilities, how does such a cute little baby, learns the language so spontaneously!
The thing which is going on inside his brain is nothing short of rocket science!

But, now we are going deep to understand what is really happening inside his brain when he is learning the language (through listening to it)

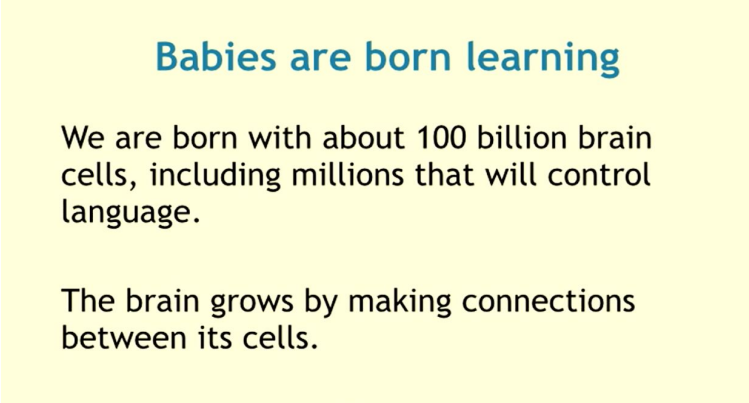
This is Emma, she is listening to different languages while we will be scanning through her brain, understanding that what parts are active.



This is the picture of Emma's brain. First, the auditory part lights up and then the visual element and then many different parts of the cortex signalling that something magical is happening inside her cute little head:p

This picture gives us the idea of how complex the brain is and the immense possibilities which can be accomplished through the use of it….

Nature has fundamentally given us this opportunity to learn any skill whatsoever, and we are most genius species on this planet and in the known universe!

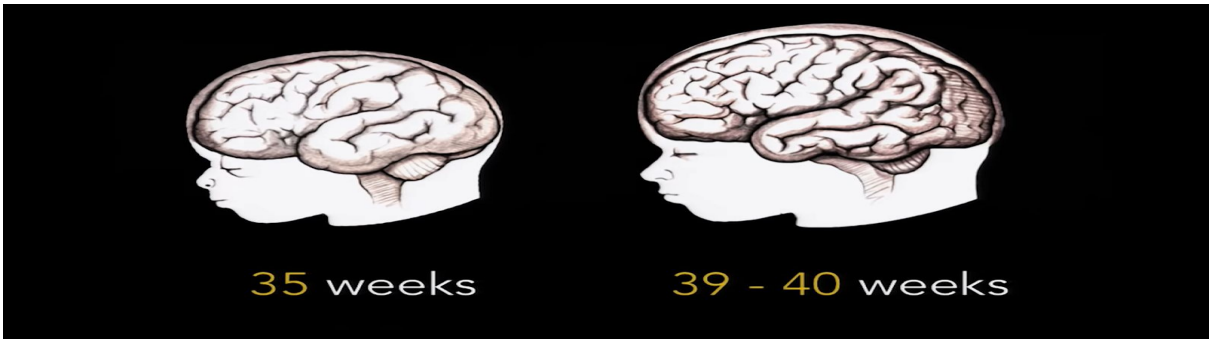


The mirror neurons,
And these 100 billion neurons which we inherently get from the time we are born which further grow into 10000 billion neurons, these little cells give us the ability to learn and use our environment and grow as unique species, famously known as the human being!
Well, this seems to be my hypothesis of language acquisition.
Our billions of neurons when they come into this world, they give attention to every little thing, like really anything that's in front of them. The toy over cradle their, moms' smile and many - many more things the phonemes are one of them, our brain recognises the different patterns, it absorbs data like a sponge absorbs water.

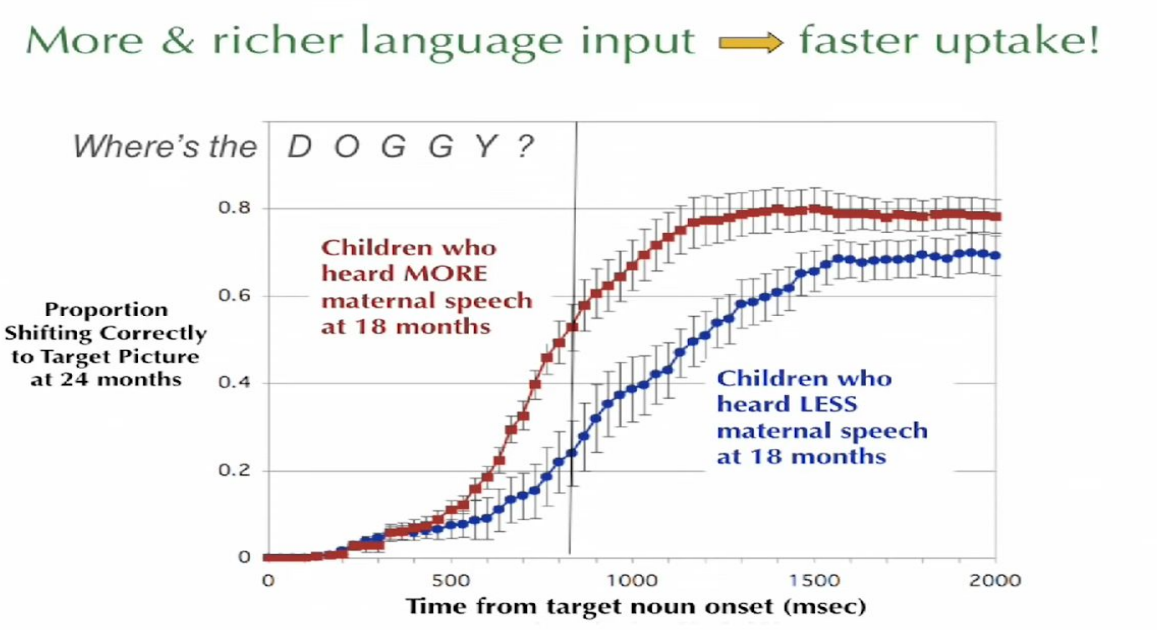
Child's brain is a blank slate, but not entirely, in the last three months of the pregnancy, the children learn before even coming out of the womb,
An experiment was conducted, in which a lady used to sing a story every day during the last 3 months of her pregnancy.
After the child was born, that child gave preference or knowingness or an attachment to that specific story, even if that story was read out by someone other than his mother.

This hints for prenatal learning that babies are learning even before they are born.

The below picture shows the magnitude by which the child's brain grows.

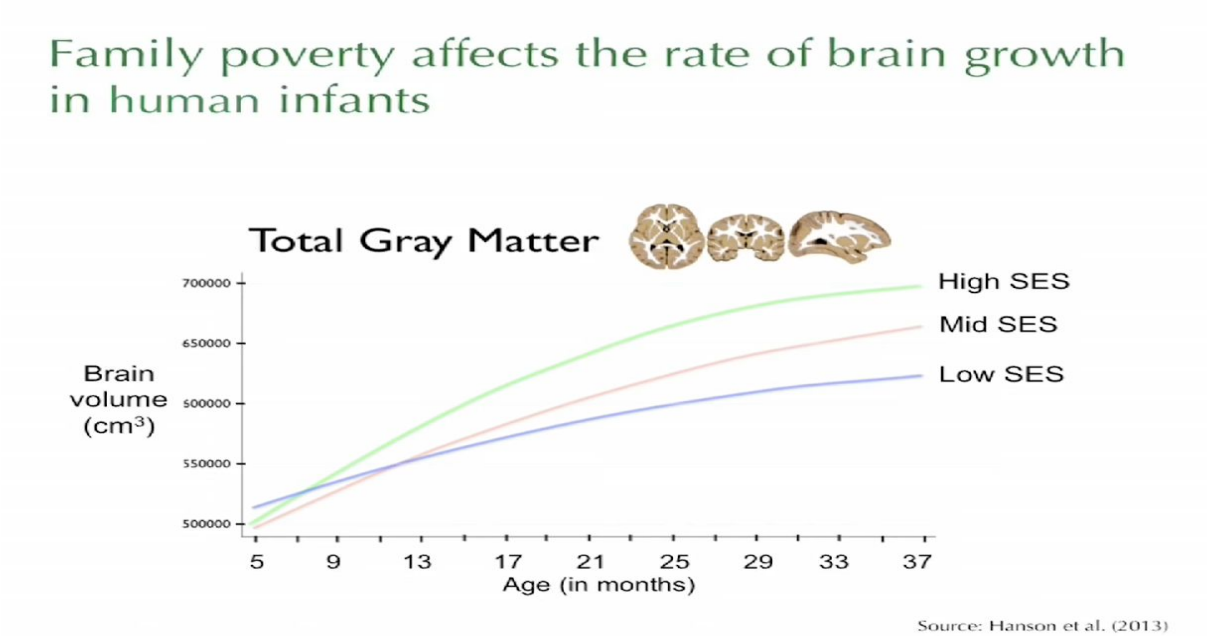


This is the same baby brain, before and after the last trimester of pregnancy. The brain grows at the fastest pace, from the last trimester of the pregnancy to 1 year of age.
A fascinating analogy would be of, IITK students, the magnitude by which a student can increase his cpi in the 1st year is very high, cause his mark sheet is entirely empty (I hope you had a good laugh here :p), but on the later years, it becomes challenging for the student to increase his cpi if he doesn't do well in 1st year.

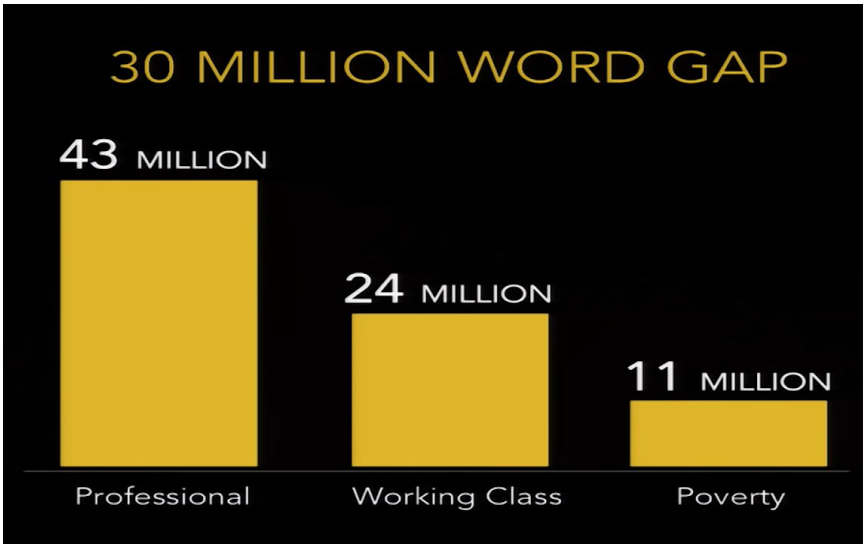


This is from the study conducted by" Dr Brenda Fitzgerald" in leveraging the simple practise of talking to babies and toddlers to nourish their brains and set them up for better performance in school and life.

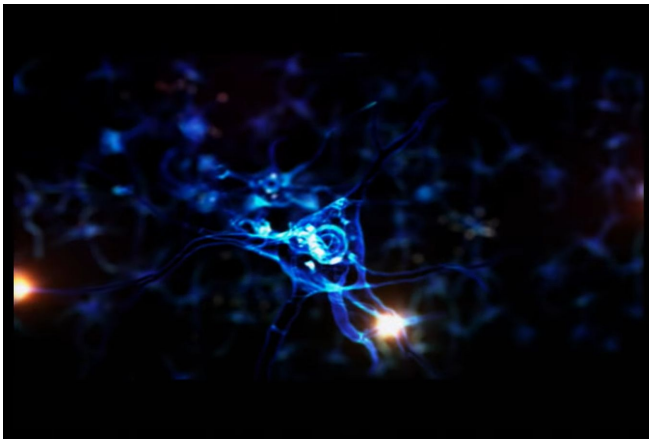
This graph explains how the **more comprehensible speech** is responsible for, the better acquisition of the language!
The quality of the IDS / CDS is what determines how smoothly our children will acquire language!



In the above picture, the SES represents the income of the family. It depicts the reality of how the brain is affected by poverty, which in turn lead to a loss of proper acquisition of language.



Below picture gives us the data that, well off families, spoke nearly 30 million more words to their children than working-class families.
Which results in better language acquisition and brain development of the well off family's child as compared to other class people.



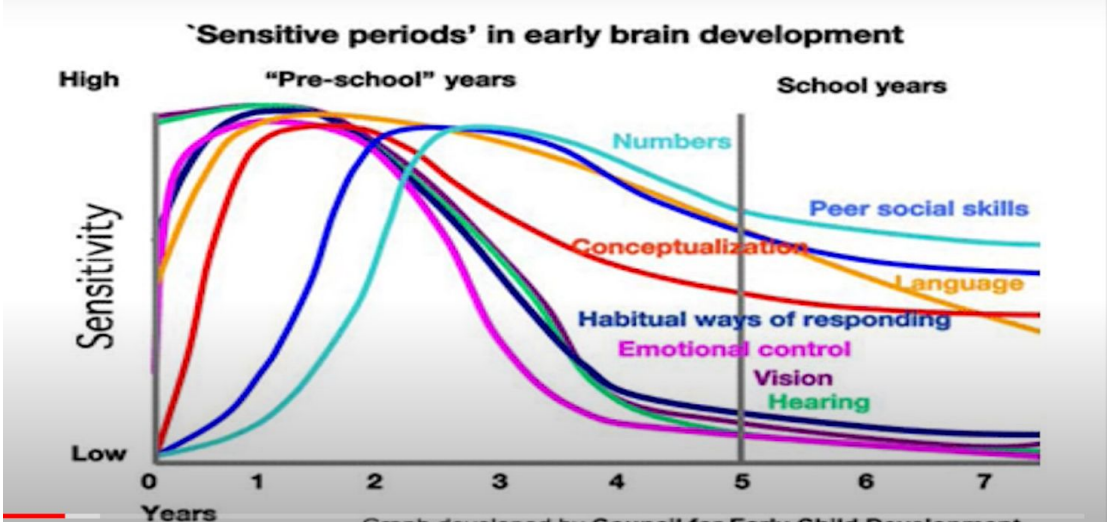
Those 30 million more words are essential! Because neurological and, actual physical development of the brain depends on the acquisition of language.

Each time a word is said or heard, it shoots up the neuron and when that word is repeated that same path is stimulated again, and it gets stronger and stronger, it branches out, so there is the capability of learning, and if those word sounds are not reproduced, the reverse happens! Those neurons shorten and die and go away! Which is scientifically known as pruning.

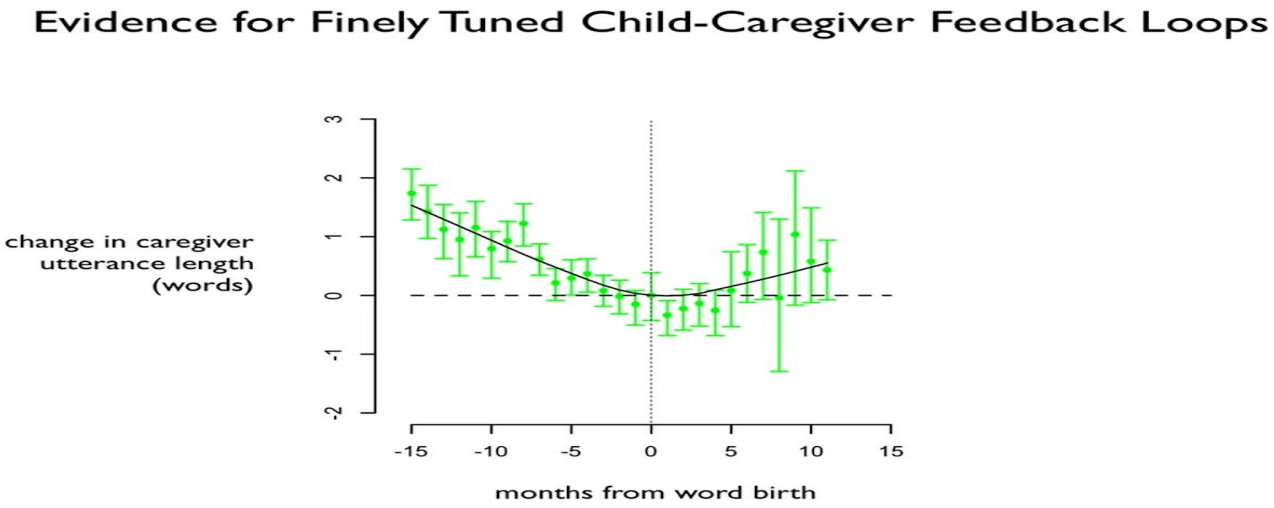
Now, we can very well see the complex, fascinating, mysterious hide-play between nature of the human's and nurture of the parents & surroundings which is responsible for the optimal growth of the human being for any task whatsoever, language for our discussion!

Stanford labs conducted this experiment and here the mother suddenly makes a still face in front of her baby , and then the baby tries to do all those things to catch mothers attention and imitates her, it is evident from this experiment that something is hardwired in babies from the starting by which they can easily acquire anything.

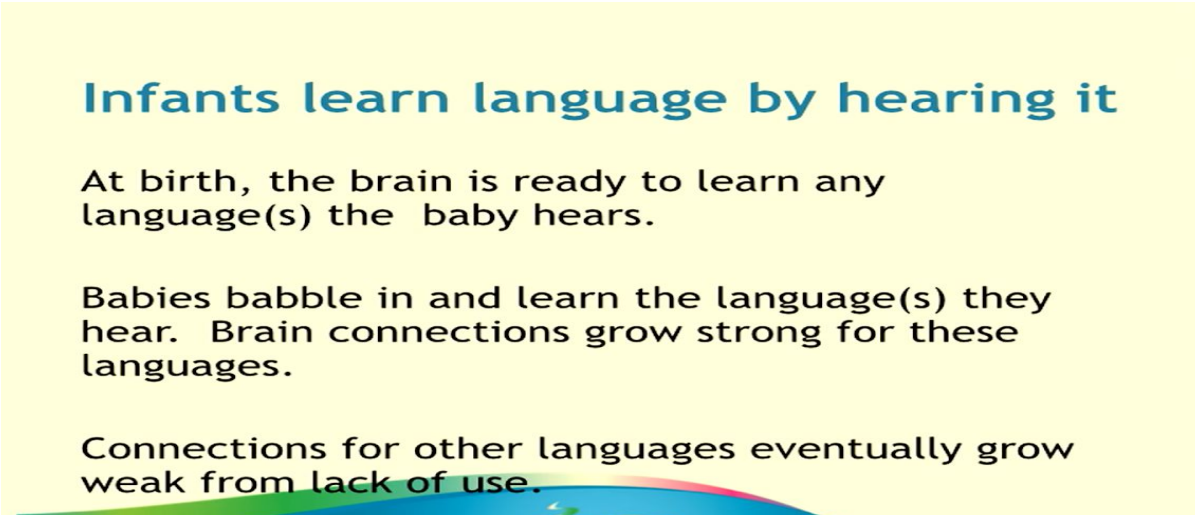
Why I have mentioned this experiment is to give light to the nature part of our brain, our evolutionary memory which we carry inside our genes

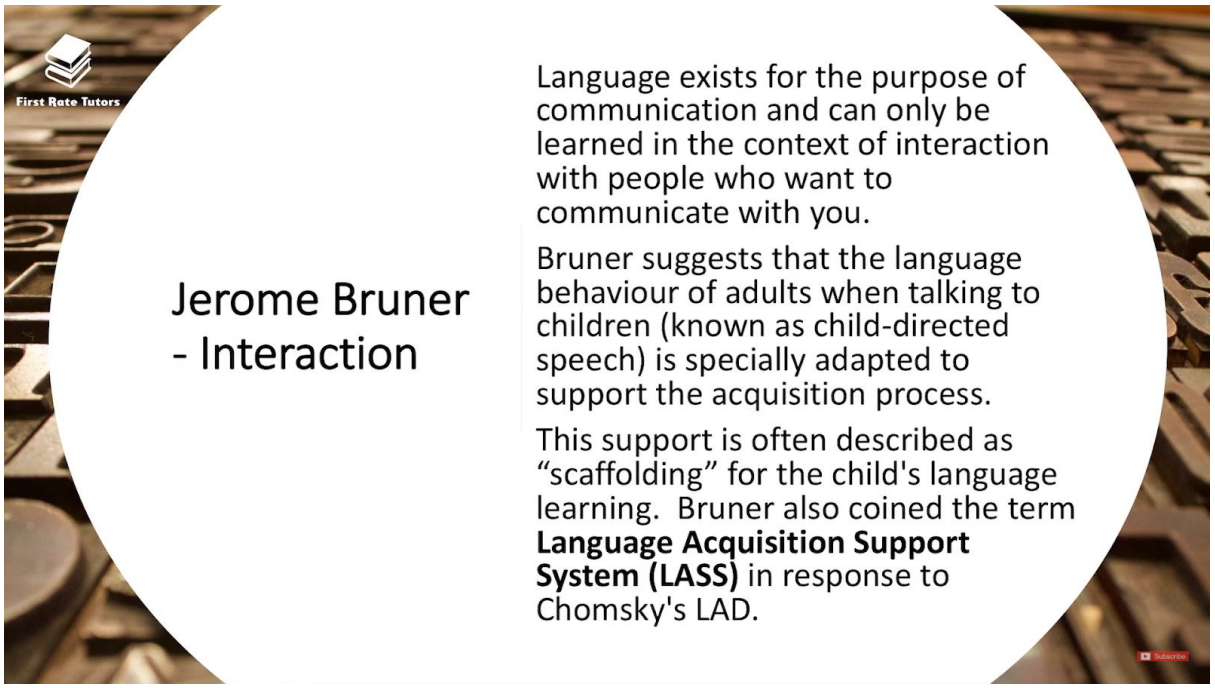


The above graph is formed by the Council for Early Child Development (Nash 1997). The line in yellow represents the language.
What this tells us is how the full development of many vital activities of the brain happened before the age of one!

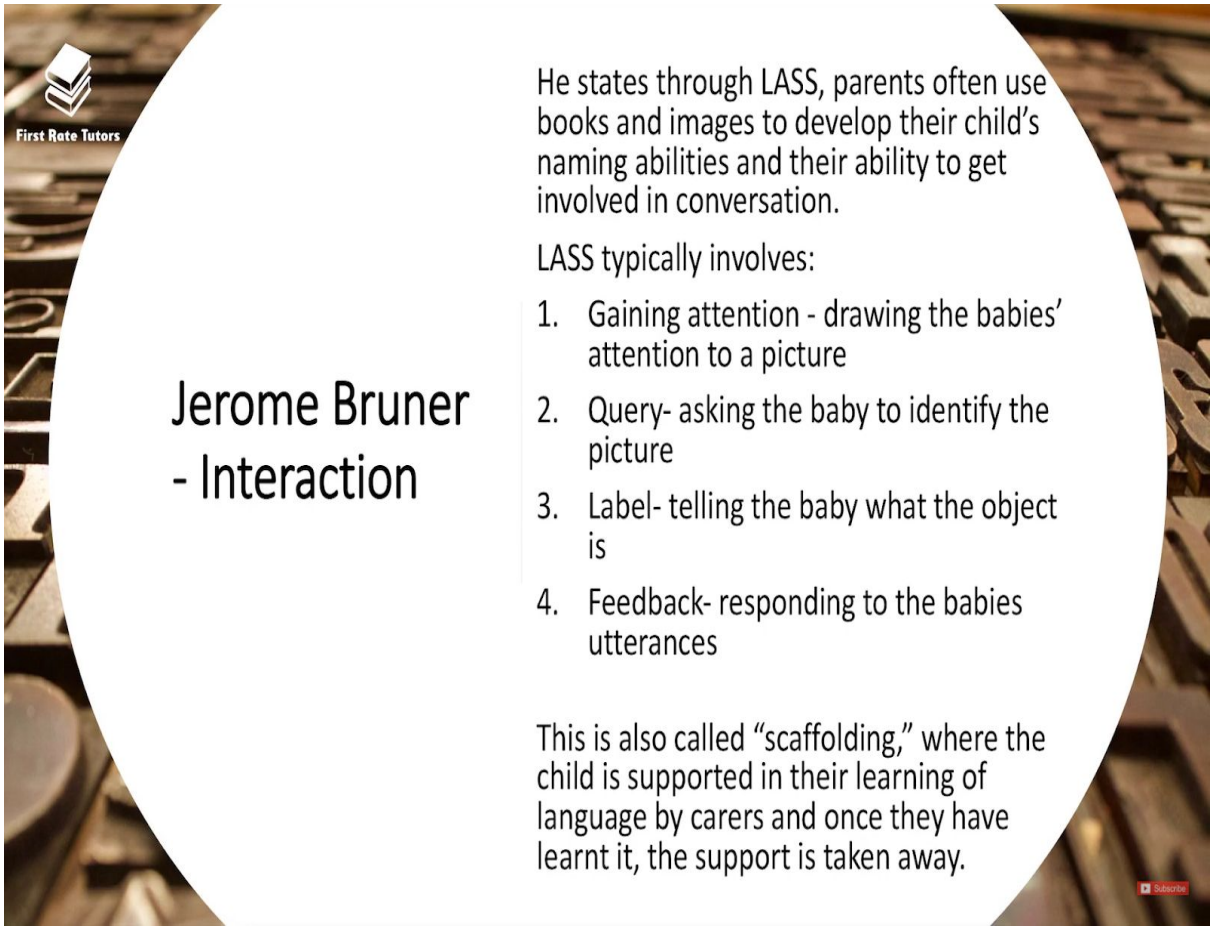


The above graph is a snippet from one of MIT's research project on the birth of a word. From this curve, it is so clear that the child learns the word bit by bit. There is a **giant feedback** loop, given by the caregivers which change their IDS according to the utterance of the child, the child correctly speaks the word at a specific time, that is where the **birth of a word** is done. Then the graph again shoots up, indicating the returning to the usual complexity!





The theory that I agree with the most is the **Language Acquisition Support System**. It seems most plausible to me that we humans learn by both nurture and through our nature



The above picture summarises, that what do LASS comprises nearly.

In the end, I would like you to see this video, it explains how the birth of a word takes place, how the human mind under the nurture of caregivers, acquires language.
This video is one of its kind, it shows how the origin of the words takes place around the same specific hotspot, where that word is repeatedly heard, in the same context.

I have literally so much to write and explain that whole week will fall short for it :p

I have to stop somewhere, So I feel, Till now I would have convinced you that how **nature and nurture both** crucially play a role in acquiring a language.

Our brain gives us the platform, and we as an environment and social being imitate and absorb from it and grow into a more intelligent human being.

The debate is never-ending, but most of the experts agree that its amalgamation of both our nature and nurture that makes it a cakewalk for babies to acquire language. Yes, this all definitely explain the below figure :p

Miss you granny!
Keep well and Safe Sir,
Thank you for giving me this learning opportunity!
Tejesh Vaish