



WHY EARLY CHATTER MATTERS: THE ROLE OF LANGUAGE IN SHAPING FUTURES

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YOUNG REVIEWERS:



GIA

AGE: 11



NAMI

AGE: 14



TIERNAN

AGE: 11

The words we learn early in life are building blocks for our brains, helping them grow and helping us understand the world better. As we learn new words and the concepts behind them, we support the foundation on which our future learning, relationships, and achievements are built. A rich early vocabulary opens the door to understanding complex ideas, solving problems, and expressing thoughts and emotions more clearly. Early language can even support distant future outcomes such as academic success in high school and employment as an adult. This article will discuss why early chatter is so powerful, how it supports future learning, and what factors are the most important contributors to developing vocabulary in the first few years of life.

BUILDING BLOCKS OF THE MIND

You might think that the words we learn early in life are simply passing chatter, but have you ever wondered just how powerful these first

VOCABULARY

The words you know and can use to talk and understand others.

words can be? Imagine a snowball rolling down a hill, picking up snow and growing as it travels ever more rapidly. Think of this snowball as the developing mind, and the words we learn as the snow, or knowledge, helping it grow bigger and faster. The more we know, the more easily we learn new things because we have a foundation on which to build our knowledge. As we build knowledge, our **vocabulary** shapes how we communicate and how we think, learn, and interact with the world.

From our very first “mama” or “dada”, to our endless stream of questions as curious toddlers and preschoolers, every word is a building block in the magnificent architecture of our minds. These early words are keys that unlock the doors to understanding the world around us, and they form the foundation of future learning, relationships, and successes. So, let us embark on a journey to discover why early chatter matters and how it shapes the future of everyone on Earth.

FIRST WORDS

Before babies begin speaking, they go through stages of cooing and babbling. Although these may sound like random noises, parents treat them as meaningful and engage in responsive **serve-and-return interactions** [1]—think of when you “serve” a ball in ping pong and your friend “returns” it and imagine an infant “serving” or starting a conversation by cooing. These early conversations lay the critical groundwork for early language abilities that support our thinking.

Cooing typically starts around two months of age. This is a baby’s way of experimenting with sounds, learning to control their vocal cords, and practicing their breathing. Soft, vowel-like sounds such as “oo” and “ah” are common in this stage. Cooing can be thought of as a warmup, when infants prepare their vocal muscles for more complex tasks ahead.

At around six months of age, babies start babbling. This stage introduces a mix of consonant and vowel sounds, like “ba-ba” or “ga-ga”. In babbling, babies practice slightly more complex sounds and even practice communicating. Through babbling, infants begin to control their mouths, tongues, and teeth to create sounds that are more and more like the language they will eventually speak.

The leap from babbling to speaking our first words, usually around one year of age, is remarkable. These words are often simple and repeated like “mama” or “dada”, but nevertheless represent a dramatic advancement in brain development because babies come to understand that words refer to real people, objects, and events in the world. This milestone signifies a growing ability to associate sounds

SERVE-AND-RETURN INTERACTIONS

A back-and-forth conversation where one person talks or does something, and the other responds, like a game of catch with words.

with specific objects or people. These can be thought of as a toddler's first concepts.

LANGUAGE AND LEARNING

Between 18 and 24 months of age, children learn new words rapidly; it is not uncommon for a child to learn several new words per day (Figure 1). At 18 months, most kids say less than 100 words, but as they get older, they learn new words quickly, reaching around 300 words by age 2. One scientist analyzed vocabulary data from a large database of thousands of children [2, 3]. By analyzing these data, they showed that vocabulary builds at an ever-increasing rate during this period.

Figure 1

This graph shows that, on average, children learn more than 150 new words during the 6-month period from 18–24 months of age (data from [3]).

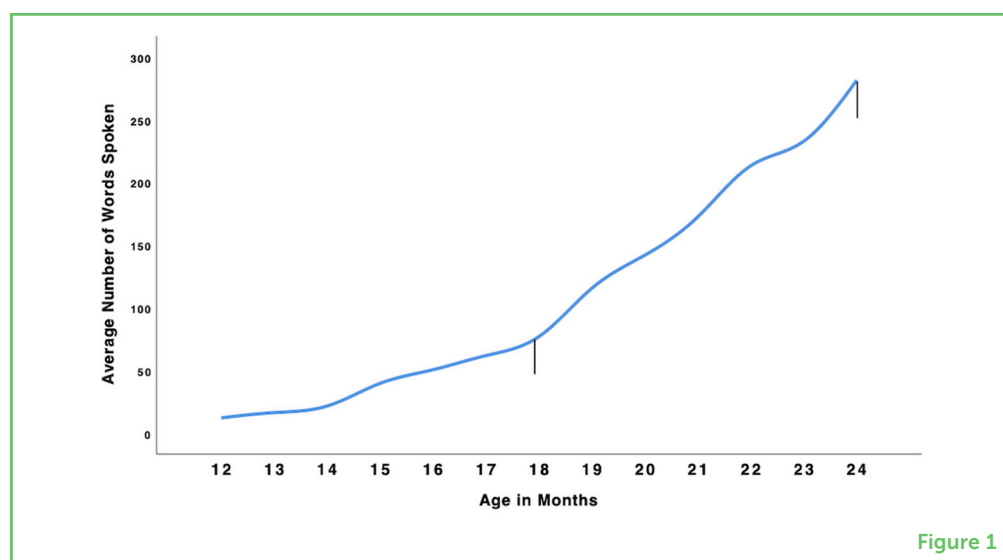


Figure 1

Words learned during this time include words for familiar things, such as colors, shapes, animals, and objects. As children learn these new words, they learn what real world people, places, objects, or ideas these words refer to. When children learn the word “dog”, they do not just say it; they learn what it is, what it does, and how it is different from a “cat” or a “bird”, for example. This **word-to-world mapping**, as it is called, helps children better understand the world around them by allowing them to organize similar objects by their names and characteristics and carry knowledge gained from one experience to the next.

As vocabulary expands into the toddler and preschool years, words become a powerful tool for grasping increasingly complex concepts. Recall how we discussed that children map their words onto people, places, objects, and ideas. Beginning very early in life, children start building connections of words that go together, either because they sound alike or because they represent similar concepts. For example, as they map the word “toe” to their own toes and “finger” to their own

WORD-TO-WORLD MAPPING

Learning what a word means by matching it to things you see or hear around you.

fingers. They may observe that these are both parts of the body, like arms and legs and belly buttons. Similarly, "cat" and "bird" are part of the category of animals including dogs and horses and even bears. These words can even be linked to other things found outside, like trees, flowers, and parks (Figure 2).

Figure 2

Learning a new word helps children to learn other related words. For example, on the left side of the network, there are words for parts of the body connected to each other, showing that as children learn the names for body parts, these words become connected to other, related words in the brain. In this way, children can begin to form a "body parts" category. As children learn one word, it can lead them to learn related words, building a network of vocabulary that is connected in meaning and context, just like a web (image created using Canva.com).

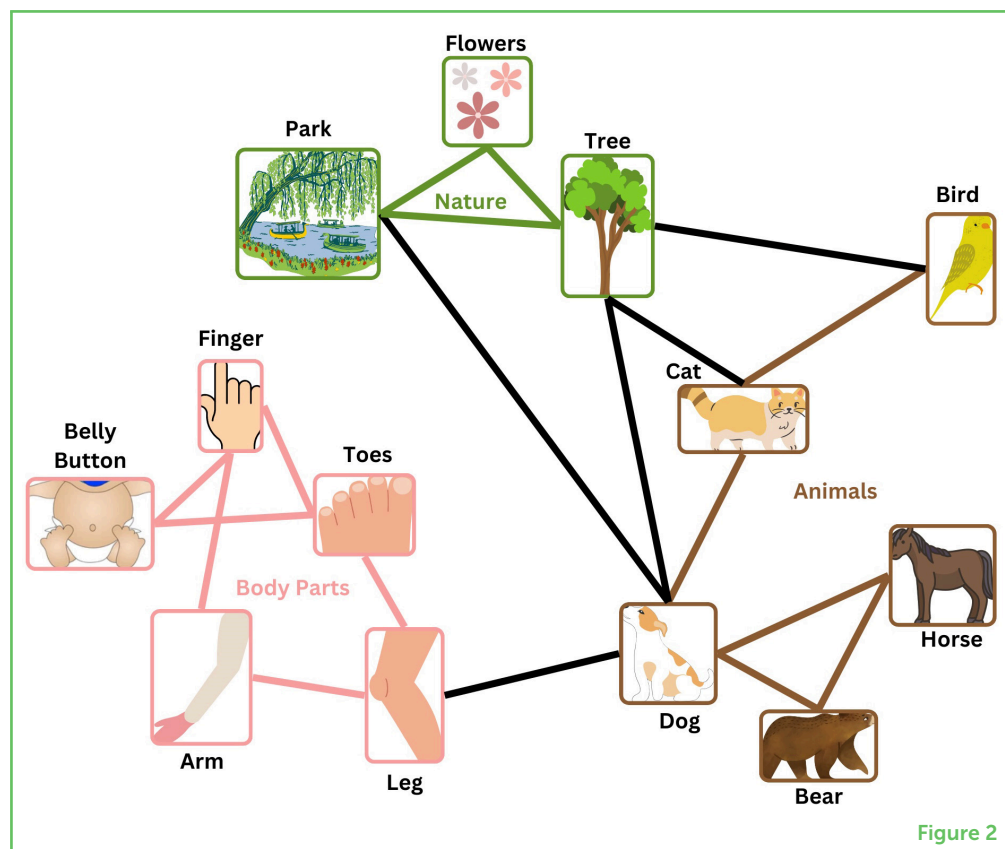


Figure 2

This mapping helps children understand their immediate surroundings and apply these new words to further their learning. For example, mastering comparison words like "bigger" and "smaller" introduces children to basic concepts crucial for developing mathematical and scientific thinking. In this way, early vocabulary prepares us for success in school. Early language skills are linked to learning to read and write and even to math and science skills. **Reading comprehension**, understanding the meaning behind the words we read, relies on having a broad vocabulary. As we absorb new information, interact with peers and teachers, and reason through challenging problems, we grow our vocabulary. This is important throughout our lives because early success in school is linked to how well we do in high school, whether we go to college, and our chances of getting a job as adults.

LANGUAGE AND CONNECTION

Being able to understand instructions and communicate our thoughts clearly helps us to be successful in social settings. In addition to

READING COMPREHENSION

Understanding what a story or book means after you read it.

supporting academic success, using language effectively is important for forming friendships, expressing feelings, and navigating social situations. For instance, when we learn words to describe our emotions, like “I’m sad” or “I’m happy”, we are better equipped to manage these feelings and communicate them to others. A child who can articulate what they want or need is more likely to have their needs met, which is vital for emotional well-being and self-esteem. Effective language also allows us to learn to recognize and respond to the emotions of others. In classrooms and playgrounds, language enables us to engage in collaborative play, negotiate roles, and resolve conflicts, all important aspects of social learning and development. So, in summary, early vocabulary supports mathematics, reading comprehension, writing abilities, and social emotional skills, which go on to support high school success and employment outcomes (Figure 3)! Wow!

Figure 3

Early vocabulary continues to support positive life outcomes into adulthood.

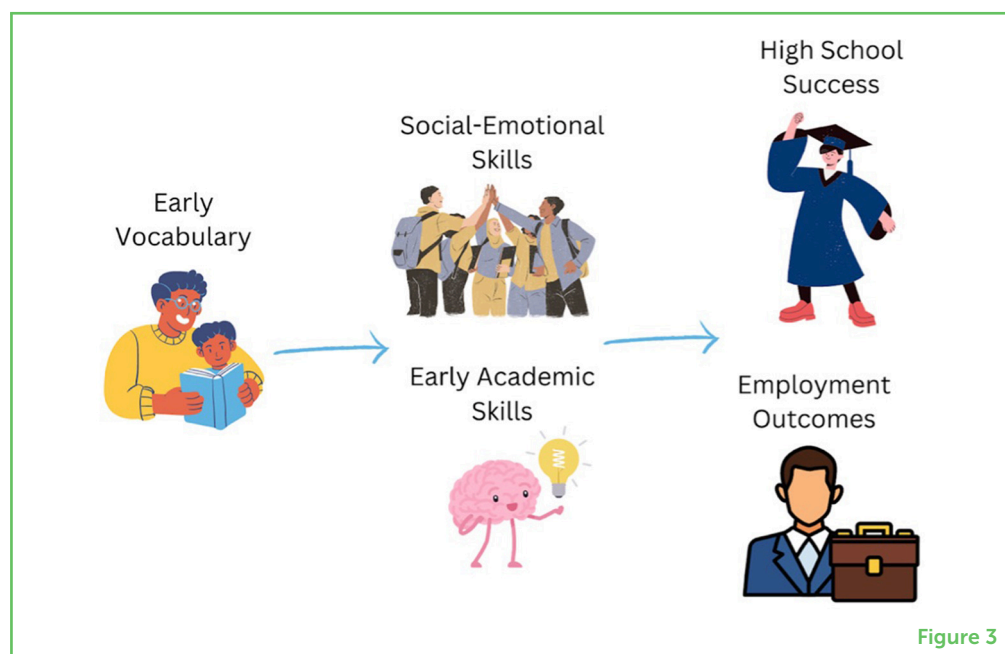


Figure 3

THE ENVIRONMENT

It is within the family environment that children first experience language through conversations, stories, and songs. This early exposure is critical, with its most important feature being that it is dependent on the child’s responses. Remember serve-and-return interactions? We can even see these interactions in the brains of parents and their children. For example, one study used a way of measuring brain activity, called **magnetoencephalography** (MEG), to study these conversations [4]. “Magneto” refers to the use of a very sensitive magnet to take measurements of electrical signals. “Encephalography” comes from the word “encephalon”, which means the brain. So, this technique uses a sensitive magnet to measure electrical signals in the brain. Using MEG, scientists found that

MAGNETOENCEPHALOGRAPHY

A special tool that helps scientists see how the brain works by measuring tiny signals made by the brain.

SYNCHRONIZED

Happening at the same time or working together.

caregiver and child brain activity is **synchronized** when they engage in serve-and-return interactions. When parents and caregivers talk with their children, respond to their babbling, and encourage their attempts at words, they provide a rich environment for building language. These interactions are like fertilizer for the brain, strengthening the brain cell connections that support language learning. Children who have more of these interactions with adults show greater activation in the brain areas responsible for language [5].

Among our friends and classmates, environments vary, and these variations can lead to differences in children's rates of learning and ability. For this reason, it is important to have sensitive and responsive caregivers, whether these are our parents, grandparents, aunts and uncles, or teachers in daycare and preschool. You can also help your younger brothers and sisters, younger children at school, and even your own children someday. Environments can vary in many ways: the number of people in our homes; whether we are the oldest (or youngest) child or somewhere in between; our experience with books, interesting puzzles, and games; and the language that we speak at home. Environments are important to word learning—from early conversations and learning to match words to pictures and objects, to building the brain structure that supports mature language. Additionally, the words we learn, and the languages we speak, influence both how we name what we see and the kinds of information we focus on as we explore our environments as teenagers and adults [6]. What may seem to be simple chatter when we are children influences what we learn next, our achievements in school, our opportunities in the future, and even how we see the world!

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YOUNG REVIEWERS

GIA, AGE: 11

My name is Gia. I love to write books in my free time. I love to roller skate and I want to become a writer when I grow up. I also enjoy fencing and volleyball.



NAMI, AGE: 14

I like playing sports, especially with my friends, because it is active and fun. I am curious about Chemistry practical/experiments since it is exciting. I spend most of my time doing sports, homework, reading, watching TV, or gaming.



TIERNAN, AGE: 11

My name is Tiernan. I like to play both video games and real life games. I am a musician and I enjoy playing the violin. I am also a senior green belt in Tae Kwon Do.



AUTHORS



MATTHEW MCARTHUR

Matthew McArthur loves to learn and help people. He grew up always asking questions and wanting to know how things worked, especially when it came to how children grow and learn. This curiosity led him to study psychology, which is the science of how people think and feel. Matthew went to college at the University of California, Los Angeles and then continued his studies at San Diego State University, where he earned his master's degree in psychology. During his time in school, he focused on how kids develop language and how different experiences, like the COVID-19 pandemic, affect their learning. *mmcarthur0659@sdsu.edu



MARGARET FRIEND

Margaret Friend studies when and how early words are learned and how this helps thinking in children learning one or more languages. She developed the Computerized Comprehension Task, which allows scientists to measure what words children know. Scientists in other countries have adapted this task to study their home languages (French, Norwegian, Danish, and others). She is a member of the MacArthur Communicative Development Inventories Advisory Board and the Center for Clinical and Cognitive Neuroscience and directs the Infant and Child Development Lab at San Diego State University, where she works with student researchers and teaches courses in developmental science.