



Research Sheds Light on How Babies Learn and Develop Language

Insights for parents, teachers, and educators from research by [Dr. Marianella Casasola](#), Associate Professor in the Department of Human Development, Cornell University.

[Kimberly Kopko](#), Ph.D., Extension Associate

What is clear to anyone who enters Dr. Marianella Casasola's Infant Studies Laboratory, or "baby lab," is that Dr. Casasola is very interested in babies. Except for the computers and other technical equipment, the space resembles an open, baby-friendly play area. And it is in this space that Dr. Casasola, Associate Professor in the Department of Human Development at Cornell University, conducts her research on infant cognitive development and early word learning in pre-verbal babies.

Dr. Casasola's research provides a window into how babies learn and develop language skills during the first 2 years of life. Her findings demonstrate that infants are learning *about* their language well before they *speak* their language. Parents of infants no doubt agree that babies recognize words before they are able to verbalize words. What is apparent from Casasola's research, however, is the degree of complexity that babies possess in learning language and how the use of novel words and events promotes learning.

Dr. Casasola is particularly interested in the interaction between cognition and language development during the first 2 years of development and there are 3 questions that drive her research: 1) How do babies learn? 2) How do babies develop language? and 3) How do the two areas intersect? Studying how infants learn and what they already know requires an understanding of the manner in which babies develop abstract concepts, generalize



"Her findings demonstrate that infants are learning about their language well before they speak their language."

information from one situation to another, and form categories, all of which provide coherence to a baby's world. Studying how infants develop language requires an understanding of how babies develop words for objects and actions. Finally, in collaboration with colleagues and students, Dr. Casasola examines how language and learning interact in everyday circumstances. She seeks to understand how babies learn words and how learning language helps to solidify what babies already know and, perhaps, how it leads babies to learn what they may not have learned otherwise.



Cornell University



Research Studies

One strategy that adults use to develop babies' language acquisition is labeling. By labeling an object, a parent or caregiver identifies the names of specific objects for the baby. For example, when a baby picks up a ball, a parent may respond, "that's a ball." Researchers assert that babies' early vocabulary development is stimulated when adults label items, thereby facilitating babies' ability to associate words with objects.

In one experiment, Casasola & Bhagwat examined the extent to which labeling objects helps babies learn. In this study, 18-month-old infants were shown 4 different videos of a support relation (two objects placed together): a car placed on top of another car, a cup placed on an inverted bowl, a Duplo figure placed on a Duplo car, and a turtle placed on a pole. One group of infants heard a novel word to describe the objects occupying the space as they viewed these events: "Wow! She puts it toke." A second group of infants received the same novel word as a count noun ("Wow! It is a toke.") A third group simply viewed the events in silence to establish how infants attend to the support relation when not hearing any language.

Results showed that infants who heard the novel spatial word looked significantly longer at the novel relation than the familiar spatial relation indicating that the infants learned to recognize the support relation as familiar relative to the containment relation. In contrast, infants who viewed the events in silence and most infants who heard the novel word as a count noun did not. The results demonstrate that providing a label to an event helps infants learn about what they see. Providing a spatial word, even an unfamiliar one, can aid 18-month-old infants in recognizing a support relation as familiar.

Infants learn language according to a highly organized set of rules containing five systems: phonology, morphology, syntax, semantics and pragmatics. Semantics refers to the meaning system. The meanings of words or actions may differ across languages and vary according to what's relevant to a baby's native language. For example, in the English language there is a distinction between the categories of *in* and *on* such that we say the clown is *in* the car and the tire is *on* the car. Whereas in the Korean language, there is no distinction between *in* and *on*, but rather a distinction between *loose-fitting* events and *tight-*

5 SYSTEMS OF LANGUAGE RULES

Phonology—refers to the sound system of language. A phoneme is the most basic unit of sound that affects meaning. The word *cat*, for example, has 3 phonemes: /c/ /a/ and /t/ that when combined produce the word "cat."

Morphology—refers to the units of meaning in a language.

Morphemes are the smallest units of meaning that cannot be broken into smaller meaningful parts. The word *work*, for example, cannot be broken down and still have meaning. However, it can be combined with the suffix *ing* to form the word "working" which consists of two morphemes.

Syntax—refers to the way words are ordered and combined into appropriate phrases and sentences.

For example, the word order "*Dan kicked the ball*" has a different meaning than "*The ball kicked Dan*."

Semantics—refers to how the meaning of language is created by the use of words and sentences.

Every word has a semantic characteristic. For example, *sapling* and *tree* share semantic qualities, but they differ in degree by size.

Pragmatics—refers to a set of rules for language use in different contexts.

Pragmatics is concerned with social interaction and effective communication. For example, a child learns to speak politely to his teacher at school ("May I play with the blocks?") but may not speak politely to his younger sister at home ("Those blocks are mine, not yours!").

fitting events with a loose-fitting event being similar to *on* and a tight-fitting event being similar to *in*.

In a separate experiment, Casasola and her colleagues explored whether 21-22 month-old toddlers who were learning the English language could acquire a novel word to describe a "tight-fit" relationship between two objects, a relationship that is identified by a word in Korean language, *kkita*, but not by a word in the English language. In the training session, four pairs of objects were selected to depict actions resulting in a tight-fit relation. Results from this study indicate that toddlers can map and generalize a novel word onto actions resulting in a tight-fit relation, despite having limited experience with the novel word. These findings indicate that toddlers can "apply"

an unfamiliar word to an event that is similar to one they recognize (i.e., tight-fitting is similar to in) and provide insight into how young English word learners begin to form language-specific categories to represent spatial relationships.

Despite the number of different languages in the world, infants learn language in a universal, relatively predictable pattern. Milestones in infant language development include communicating at birth by crying, cooing at 1-2 months, babbling at 6 months, use of gestures and word comprehension at 8-12 months, speaking first words at 13 months, a rapid growth in vocabulary by 18 months, and significant increased word understanding and speaking of two-word utterances such as “my toy” between 18-24 months.

Parents and caregivers are the most significant adults that babies interact with and communicate their needs to. The ways in which adults respond to and engage babies will aid language development during these very important early years.

Tips for Parents

- Attach words to objects. Labeling helps babies learn. Sometimes it is easier to engage your child if you label what is already the focus of their interest rather than trying to redirect their attention.
- Use words to describe your actions: “Mommy is putting the milk in the refrigerator.”
- Use words to describe your child’s actions: “You are putting the blue car next to the red car.”
- Explore books with your baby (board books are ideal for infants and toddlers) and use action words to describe the story.
- Read to your child! Reading not only promotes language development, but also creates special time with you and your child.
- Talk to your baby often. Research demonstrates that frequent communication with infants and toddlers is directly related to the amount of words babies learn.
- Act out songs (e.g., “If you’re happy and you know it clap your hands”). Babies will learn to share in the songs’ movements with you (and may help them learn new words).
- Play word games such as “Pat a Cake.” Doing so will facilitate infants’ ability to hear and learn language in a playful context.

- Understand that many factors affect language development—for example, simultaneous exposure to more than one language and a focus on physical activities, like walking, may briefly divert your baby’s attention from learning to speak.
- Have fun with your child. As Dr. Casasola’s colleagues note in the title of one of their books, *Einstein Never Used Flashcards!* Your child does not need to either. Children learn by engaging with others and with their surroundings. Simply spending a little time playing with babies will help promote their development.

Further Resources

Cornell Infant Studies Laboratory: <http://www.human.cornell.edu/che/HD/CISL/index.cfm>

Family Reading Partnership <http://www.familyreading.org/>

Speech and Language Developmental Milestones: <http://www.nidcd.nih.gov/health/voice/speechandlanguage.asp>

Use of baby DVDs and videos and infants’ language development: <http://uwnews.washington.edu/ni/article.asp?articleID=35898>

Zero to Three: Early Language and Literacy: http://www.zerotothree.org/site/PageServer?pagename=key_language

The Sounds of Language (from the National Center for Family Literacy): <http://www.famlit.org/site/apps/nl/content2.asp?c=gtJWJdMQIsE&b=1988675&ct=2084703>

References

- Casasola, M., & Bhagwat J. (2007). Does a novel word facilitate 18-month-olds’ categorization of a spatial relation? *Child Development*, 78, 1818-1829.
- Casasola, M., Wilbourn, M.K., & Yang, S. (2006). Can English-learning toddlers acquire and generalize a novel spatial word? *First Language*, 26(2), 187-205.

Development of this publication was supported by Smith Lever funds from the Cooperative State Research, Education, and Extension Service, U.S. Department of Agriculture. Any opinions, findings, conclusions, or recommendations expressed here are those of the author and do not necessarily reflect the view of the U.S. Department of Agriculture.