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Word Learning

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One important part of learning a language involves mastering the forms of words and linking these to their meanings. Because words are not only part of language but also delimiters of specific concepts and means for social action, word learning has been a central topic in cognitive science. Although the first traces of word recognition can be detected in the eye movements of infants as young as 6 months, children typically produce words for the first time around their first birthday, and their learning accelerates thereafter. Word learning also continues throughout the lifespan. Estimating total vocabulary is tricky because words have many forms (e.g., “walk,” “walks,” “walked,” “walking”), but literate adults are estimated to know between 30,000 and 60,000 words. To accumulate this knowledge, children must be learning at least a handful of words every single day.

History

Since at least [Augustine's \(379\)](#) *Confessions*, researchers have been interested in the developmental origins of language [see [Language Acquisition](#)]. The *Augustinian view* is that words are learned via ostensive labeling, in which children are shown examples of a particular word often accompanied by social gestures like pointing. Hearing a word being used in a particular context does not uniquely identify the word's meaning, however. Imagine you see someone point to a rabbit and say *rabbit*—how do you know that *rabbit* does not mean “rabbit leg” or “furry” or even “undetached rabbit parts” ([Quine, 2013](#))?

Many words' meanings rely on the way they relate to other words, not from their relation to observable parts of the world. Think about learning the word *of*—there is not something you can point to and say “that's *of*.” Instead, the word plays a role in the linguistic system ([Wittgenstein, 1953](#)). Function words of this kind are typically learned somewhat later than words for simple objects like “ball” but still quite early—by their third year of life, most children are producing many function words such as “of,” “and,” and “the.”

Early developmentalists speculated about these issues by observing children's language use in their natural environment using diary studies. Later progress came from using systematic recordings and transcripts to investigate the generalizations that children made during learning ([Brown, 1973](#)). Modern research often uses a combination of recordings (now with wearable recorders or cameras; [Smith et al., 2015](#)) and experimental methods such as generalization tasks (e.g., [Berko, 1958](#)).

Core concepts

Children's vocabulary can be measured via receptive tasks—for example, whether they look at a picture matching a target word (e.g., [Bergelson & Swingley, 2012](#))—or by production—for example, whether they can name a picture. Young children typically understand many more words than they can produce, in part due to the difficulty of mastering speech production and in part because understanding can sometimes rely on partial meanings. For example, a child may know that *gazelle* names an animal without knowing which animal it is.

Social information is an important part of children's early word learning [see [Social Learning](#)] ([Clark, 2009](#)). Early word meanings are often acquired through joint attention, in which the child and another party (often a caregiver) come to understand that they are sharing attention to a referent ([Tomasello & Farrar, 1986](#)). Joint attention often occurs either when children and adults jointly handle an object or via mutual gaze. Children then can generalize productively from individual examples of a word to a broader concept via a combination of inductive reasoning ([Xu & Tenenbaum, 2007](#)) and some more general learning biases (e.g., a bias to think that words name whole objects; [Markman, 1990](#)).

Children's vocabulary first contains mostly names for things, people, and social routines, leading to an early bias for nouns ([Bloom, 2002](#)). Perhaps surprisingly, the concepts that are represented in this early vocabulary are very similar even for children learning very different languages ([Frank et al., 2021](#)). But as they begin combining words, children's vocabulary increasingly includes words for actions (verbs) and properties (adjectives) as well as function words. The meanings of these words are not observed directly in the world but instead require knowledge of language to acquire ([Gleitman, 1990](#)).

Questions, controversies, and new developments

Is children's earliest word knowledge social and communicative in nature, or do words start out as mere associations? Some theorists have posited that children begin by linking words to their referents via direct stimulus-to-stimulus associations ([Hollich et al., 2000](#)) and only gradually come to appreciate that these sounds are being used by people to communicate—sometimes about absent or even nonexistent referents. In contrast, others have posited that even in infancy, babies understand that words serve the purpose of communication ([Vouloumanos et al. 2012](#)).

Are word meanings learned all at once, or do they accumulate gradually over repeated exposures? Adults, children, and nonhuman animals all have the ability to extract statistical regularities from passive exposures [see [Statistical Learning](#)] ([Aslin & Newport, 2012](#)). One hypothesis is that these abilities support learning-associative mappings between frequently co-occurring words and objects ([Yu & Smith, 2007](#)). On the other hand, at least some word meanings appear to be explicit knowledge learned through “aha” moments in which a meaning is discovered rather than accumulated gradually ([Medina et al. 2011](#)).

Are words learned differently in different cultural contexts? In children growing up in the United States and Europe, the amount of language children hear relates to the size of their vocabulary, with children in lower socioeconomic status families on average hearing less language ([Dailey & Bergelson, 2022](#)). The rates at which caregivers around the world talk to their children varies even more substantially, yet on average children seem to learn on approximately the same timetable ([Casillas et al., 2020](#)). One possibility is that children in contexts in which they are spoken to less directly may learn much more from overhearing language directed at others ([Akhtar et al., 2001](#)).

Broader connections

Because learning a word involves mapping form to meaning, generalizing meaning across contexts, and reasoning about social meaning in context, word learning has been a central topic bridging language development to other parts of cognitive science through connections with research on social cognition, conceptual development, cognitive neuroscience, and other areas.

Word learning also has deep connections with artificial intelligence. Classic debates about the nature of meaning representations and their connection to patterns of linguistic co-occurrence ([Landauer & Dumais, 1997](#)) have recently come to the forefront again as technologists, scholars, and the general public have debated whether large language models [see [Large Language Models](#)] truly understand language ([Bender et al., 2021](#)). These debates have been informed by our understanding of children's language learning (e.g., [Mitchell, 2023](#)).

Finally, debates about word learning have important policy implications because children's early vocabulary knowledge plays a critical role in enabling reading success when they reach school. The better children's language abilities, the more they can make successful predictions about the content that they are decoding from printed text as they learn to read ([Seidenberg, 2017](#)).

Further reading

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