

Language Development In Children

Kendra Lynn Knudtzon
Harvey Mudd College
Developmental Psychology
Research Paper
May 7, 1998

Language Development in Children

Introduction

At the age of 18 months children begin to use two-word sentences to communicate their ideas, and by 24-30 months these children are avid language users. The process by which children acquire language is a complex process that is still not completely understood. Many developmental psychologists and linguists offer theories to account for children's rapid acquisition of language, but there is still a large nature versus nurture debate concerning this process. As defined in the Dictionary of Theories, the nature versus nurture idea "refers to the separate influences of heredity (nature) and environment (nurture) on a living thing" (365). This paper addresses the concerns and problems of language development that language theorists try to account for, and presents the major theories behind the phenomenon of language development.

Mysteries and Problems of the Study of Language Development

Children's use of language occurs several months after they are able to understand language, which according to Pinker, occurs before the first birthday. Studies have shown that at birth infants are predisposed to language; they prefer to listen to language rather than random sounds (Cole and Cole). At birth infants are able to distinguish between all the world's phonemes, a phenomenon that lasts until 10-12 months (Kuhl). This ability is crucial for the children to acquire the language that is spoken in the environment which they live, since the ability to distinguish the phonemes of one's language environment is crucial to language acquisition. It is this ability which allows French children adopted by Japanese parents to speak the language of their environment (Jackendoff).

Exposure to language thus influences infants' acquisition of language. Kuhl's Native Language Magnet theory suggests that exposure to a specific language influences children's perception of speech by six months of age (Kuhl). The magnet theory suggests that children's brains organize phonetic boundaries according to native-language speech, hence the language heard in the child's environment is the one for which the magnets will make boundaries. This theory accounts for the development in the first year of life, before children really acquire word meanings. After these boundaries form, children become unable to distinguish the phonemes of all the world's languages, rather they focus on the phonemes present in their language environment. At this point of environmental-specific language acquisition, children are acquiring a database of words and word meanings.

The ability to distinguish between phonemes at birth, is lost by 10-12 months (Kuhl) suggesting the idea that there is a critical period for language development. In fact, case studies have shown that this critical period for language acquisition lasts until puberty (Curtiss). Traditionally there has been two ways to test this theory: situations where language development is delayed, as is sometimes the case of deaf children being born to hearing parents who do not know sign language and situations of extreme neglect or isolation (Cole and Cole). In Curtiss's case study of Genie, a girl who was isolated and beaten by a deranged father (Cole and Cole, Curtiss), it was shown that puberty (Genie was discovered at age thirteen) was too late for her to acquire normal language. Her language development was far "far from normal," (Curtiss, 204) suggesting that first language acquisition after the critical period will result in incomplete development.

Many language theorists have labelled various stages of language development. Most often these stages are labelled babbling, jargoning, one word utterances, two word utterances, and "all hell breaks loose" (Cole and Cole, Pinker, and Burling). During the babbling stage, children are

learning how to produce the sounds that make up language, a process that Pinker feels is a prerequisite for language development. Jargoning appears around 12 months, and is described as the vocalization of syllable strings that sound similar to the language to which the child is exposed (Cole and Cole). One word utterances or holophrases, are sometimes believed to stand for phrases or sentences (Cole and Cole). At 18 months, language development is quickly developing; children are increasing their vocabulary at a phenomenal rate of a new word every two hours (Pinker). As two or three word utterances emerge “these microsentences already reflect the language being acquired: in ninety-five percent of them, the words are properly ordered” (Pinker, 268). As Pinker’s term “the all hell breaks loose stage” suggest this stage is when children rapidly acquire vocabulary and grammar.

Between the late twos and the mid-threes, children’s language blooms into fluent grammatical conversation so rapidly that it overwhelms the researchers who study it, and no one has worked out the exact sequence. Sentence length increases steadily, and because grammar is a discrete combinatorial system, the number of syntactic types increases exponentially, doubling every month, reaching thousands before the third birthday. (Pinker, 269)

The developmental process of language acquisition is not yet completely understood because the process of acquiring a language occurs so quickly and with so many nuances that it is difficult to comprehend. Many different aspects of language and language development need to be explained before one theory could be universally accepted.

Children’s acquisition of words and word meanings is a complex process. One of the reasons is discovered when one considers the problem of reference (Cole and Cole). The problem of reference occurs when children are presented with a word and are required to pick out a word’s meaning from a multitude of different possibilities. For example, when a caregiver labels something as

an animal while pointing to the family dog, the child needs to recognize different levels of categorization: the caregiver could be giving the general word, animal or dog, the type of dog, or some aspect of the dog's physical appearance. In this example, one clearly sees that there must be some way that children parse this information to discover what the adult is referring to. Huttenlocher and Smiley suggest that "young children group their experiences in a fundamentally different way than older children or adults - and that object names, rather than standing for particular types of objects, are just another type of associate" (222). This suggests that linguists need to take into account the fact that children understand and label objects in a separate manner than do adults. Huttenlocher and Smiley claim that the fact that children use object names differently than adults do may account for the overextensions and underextensions that children often make during language acquisition, since they are prone to having different conceptions of categories.

Hutchinson and Markman proposed that children expect labels to refer to objects of the same kind or category, not a thematic related reference (Markman). They performed a study which found that when shown a picture and given a label children are more likely to select a similar object in the same category as opposed to being shown a picture without a label and picking a thematically related item. This suggests that children are associating the words they hear with categories of objects, even though when they group objects together they do so based on thematic categories. Markman presented one hypothesis to account for children treating terms as labels for categories: the idea of mutual exclusion in labels, that is, each object will have one label. This idea of mutual exclusion only applies to one level of categorization, children must learn at some point to distinguish between different levels of abstraction (Markman). One study by Markman and Wachtel showed that when children were given a label for a familiar object they were less likely to believe that the label referred to the whole object as were children who were given a label

for an unfamiliar object. This supports Markman's claim that children will first associate labels to refer to the whole object, and mutual exclusion motivates them to associate new labels to parts of objects, rather than to the object category.

Verbs present another complex feature of children's language acquisition, as their meaning is less apparent in speech than noun meanings. One hypothesis by Gleitman suggests that in most cases the meaning of a verb is determined by the context of a particular situation. However, this explanation is far from complete. For example, learning the difference between 'look' and 'see,' or 'chase' and 'flee' is a difficult task, since the context these verbs are used in is extremely similar in meaning (Gleitman). However, children are still able to derive these meanings without explicit education, so one knows that meanings of verbs can not be extracted merely from the context of a situation. Gleitman also suggests that children can link possible meanings to verbs as they apply to the contexts and narrow these meanings based on later use in another context.

Grammar acquisition also presents an amazing feature of acquiring a language. Children do not merely acquire grammar by hearing language, rather they begin to form general rules to which they apply to their increasing vocabularies (Cole and Cole). This is a process which develops naturally in language-exposed children. Studies have shown that grammar will develop even if it is not apparent in the language the child is exposed to (Goldin-Meadow and Mylander). One example presented by Goldin-Meadow and Mylander is that deaf children who are not exposed to sign language will develop home sign. Parents who use home sign will generally use only gestures, or some strings of word gestures, however these children will develop a more complex system of language. Another amazing example presented by Pinker demonstrates that children who grow up in a multi-language culture, where pidgin language is used among the adults, add grammatical structure to what they hear. Pidgin is "a simplified language that will often combine words from

different languages for communication between people who do not speak the same language” (Bothamley, 128). Children growing up in these communities will add grammatical structure to the functional language, creating a new, grammatically developed and more elaborate language, called a creole (Bothamley, Pinker). As Pinker notes, it is clear that these children cannot obtain grammar from imitation of adults, because the adults never develop grammatical structure in the pidgin, rather the children develop their grammar as they communicate with one another.

Theories of Language Development

Several theories have been developed that attempt to explain the mystery of how children acquire language. Many of these theories are based upon nature versus nurture arguments. The learning-theory approach is nurture based, and language development can be attributed to the child’s environment (Cole and Cole). The nativist approach is nature based, assuming that children are born with language learning capacities which develop as they mature (Cole and Cole). The interactionist approach combines these fundamental arguments and suggests that language acquisition is environmentally and genetically based (Cole and Cole).

Cole and Cole explain that the learning theory of language development “is just like the development of other behaviors and conforms to the same laws of learning” (316) and is based upon imitation as well as association. They further explain how classical conditioning (learning which events in an environment go with others) is used to understand language, while operant conditioning (modification of behavior as a results of consequences) is used to produce language. Also explained by Cole and Cole is that imitation is involved because children acquire the language in their environment. However, this model can not explain the problem of detecting word meanings or of constructing grammar rules.

Chomsky is one of the leading theorists in the nativist approach to language development (Cole and Cole). In his work, he explains why he believes that the learning theory is inadequate to describe language acquisition; his primary arguments address the inability of such a theory to explain that children know a great more about language than they could have learned since they don't merely reproduce what they hear, rather they reconstruct the basic grammar rules (Chomsky). Chomsky states that:

The fact that all normal children acquire essentially comparable grammars of great complexity with remarkable rapidity suggests that human beings are somehow specially designed to do this, with data-handling or 'hypothesis-formulating' ability of unknown character and complexity. (148)

Chomsky presents the ideas of a language acquisition device that is innate and which constructs "a theory of language of which the primary linguistic data are a sample" (143). Hence, it is this innate language acquisition device that allows children to recognize the universal grammars that make up human language (Cole and Cole). Nativist theorists tend to feel that language is a maturation process and the learning theory is inaccurate. This is based on the observation that children do not receive real feedback about the language they do produce, since it has been noted that parents rarely correct a child's mistakes. This view is clearly presented by Pinker:

As far as grammar learning goes, the child must be a naturalist, passively observing the speech of others, rather than an experimentalist, manipulating stimuli and recording results. The implications are profound. Language are infinite, childhoods finite. To become speakers, children cannot just memorize; they must leap into the linguistic unknown and generalize to an infinite world of as-yet-unspoken sentences.... If children could count on being corrected for making (such) errors, they could take their chances. But in a world of

grammatically oblivious parents, they must be more cautious - if they ever went too far and produced ungrammatical sentences together with the grammatical ones, the world would never tell them they were wrong. They would speak ungrammatically all their lives - though a better way of putting it is that that part of the language, the prohibition against the sentence types that they child was using, would not last beyond a single generation. Thus any no-feed back situation presents a difficult challenge to the design of a learning system...(282-282)

Pinker argues that if language development is truly innate, there must exist a place for it in the brain. He observes that disruption of “these genes or neurons [that specify language in the brain] and language should suffer while the other parts of intelligence carry on; spare them in an otherwise damaged brain, and you should have a retarded individual with intact language, a linguistic idiot savant” (45). Indeed, such cases do occur in nature, aphasia, breakdowns in language caused by damage of areas to the brain, (Bothamley) demonstrates the case of loss of language without loss of intelligence, while William’s Syndrome, a retardation condition consisting of people of average IQ’s of 50 but who are “fluent, if somewhat prim, conversationalists” (Pinker, 52) demonstrates retardation with linguistic individuals. These cases do support the innate theory of language development because they suggest that there is a portion of the brain that is essential to proper language acquisition.

Pinker also states the concern that if language is innate, it should occur at birth. It “could be on a maturational timetable, like teeth” (289), suggesting that the brain has to properly develop before language can be produced. Children need to practice language sounds before reproducing them, making development follow a sequence (Pinker, 288). However, Pinker suggests that language development takes several years to form because children are born before brain synapses and myelination are complete. “Based on extrapolation from other primates, they [human infants]

would be born at the age of eighteen months. That is the age at which babies in fact begin to put words together. In one sense, then babies are born talking!” (Pinker, 288) While this theory may seem slightly contrived, it does produce an interesting argument for the innateness theory of language acquisition.

A combinational approach to language development is presented by theorists who believe in the interactionist approach, which suggests cognitive development as well as support from the environment is crucial to language acquisition (Cole and Cole). This hypothesis suggests that grammar acquisition results from simply the necessity of using language to communicate, along with a need to express complex ideas. Cole and Cole present Bruner’s term of a “language acquisition support system,” which explains that parental behaviors structure child’s language environment to support development of language. The idea of a language acquisition system is also used by Ervin-Tripp in “Some Strategies For the First Two Years” to explain the ways that children understand and produce language. She suggests that there exist some prerequisites to language development. One such example is environmental input: merely hearing a language such as through television or radio broadcasts is not enough to acquire it, interaction must take place (Tripp). She feels that a language development system needs to include certain properties:

- (a) Selective retention of features in short-term memory, particularly order of acoustic input
- (b) Phonological and semantic selection and reorganization for retention in long-term memory
- (c) Interpretation templates, providing interpretations of structures according to the formal and semantic properties of sequences.
- (d) Successive processing by alternative heuristics, allowing shortcuts for frequent phrases, instances where nonlinguistic determinants are strong, and so on.

- (e) Formal feature generation, identifying abstract classes and providing marking of the lexicon. (Tripp, 233)

Like Tripp and Bruner, Piaget, the most famous interactionist, felt that there were cognitive pre-dispositions to language, but that environmental experience was necessary to start language development. For example, Piaget felt that pre-language stages were often instincts, but in order for language to occur, infants need to receive feedback about the sounds and words they produce (Cole and Cole).

Jackendoff presents his interactionist views on language development as three fundamental arguments:

The Argument for Mental Grammar: The expressive variety of language use implies that a language user's brain contains a set of unconscious grammatical principles.

The Argument for Innate Knowledge: the way that children learn to talk implies that the human brain contains a genetically determined specialization for language.

The Argument for the Construction of Experience: Our experience of the world is actively constructed by the unconscious principles that operate in the brain.

(6-7)

His fundamental arguments suggest that innate knowledge and experience are both important aspects of language development in children. He gives the example cited by Martin Braine that while grammar corrections are rarely provided, the instances where they are seem to be ignored by the child:

CHILD: Want other one spoon, Daddy.

FATHER: You mean, you want the other spoon.

CHILD: Yes, I want other one spoon, please Daddy.

FATHER: Can you say "the other spoon"?

CHILD: Other... one... spoon.

FATHER: Say "other."

CHILD: Other.

FATHER: "Spoon."

CHILD: Spoon.

FATHER: "Other spoon."

CHILD: Other... spoon. Now give me other one spoon?

(Jackendoff, 104)

Jackendoff presents research that grammatical patterns are not taught, that innate knowledge is necessary for a universal grammar for language development, and that the process by which children acquire language is extremely complex as one tries to account for problems of reference, categorization, and development of sentences.

Conclusions

This paper has presented the dilemmas which face researchers who try to account for language development in children. Many aspects of language acquisition are difficult to explain: how children map meanings to words, including such problems of reference in nouns and the difficulty of perceiving verb meaning, and how grammatical structures are formed. Traditionally theorists tended to either adopt a nature or a nurture approach to the explanation, and debates between these themes continue, along with theories that accommodate both nature and nurture aspects of development. It has been shown that language acquisition needs to occur before puberty, hence there does exist a critical period of language development. Learning theorists believe that language acquisition is a result of the environment, but studies have shown that language is not merely imitation, but that in the absence of grammatical structure, children will invent structure. A soundtrack is not sufficient to acquire language, interaction is also necessary. Innate language development theories demonstrate that the brain plays an important role in acquiring language, as Pinker showed in his example of aphasia and William's Syndrome. Interactionists try to address nature and nurture aspects of language development to account for the rapid acquisition of language in children. These are the theories and concerns that linguists and developmental psychologists are confronted with as they try to understand the complex process of language acquisition.

Works Cited

- Bothamley, J. (1993) Dictionary of Theories. Washington D.C.: Gale Research International Ltd.
- Burling, R. (1992) Patterns of Language: Structure, Variation, Change. Chapter 15. New York: Academic Press, Inc.
- Chomsky, N. (1972) Chomsky: Selected Readings. London: Oxford University Press.
- Cole, M. and S. (1996) The Development of Children. 3rd ed. New York: W.H. Freeman and Company.
- Curtiss, S. (1977) Genie: A Psycholinguistic Study of a Modern Day "Wild Child." New York: Academic Press.
- Ervin-Tripp, S. (1973) Language Acquisition and Communicative Choice. Stanford: Stanford University Press.
- Gleitman, L. (1990) "The structural sources of verb meanings." Language Acquisition, 1, 1. Rpt. in Language Acquisition. Ed. Paul Bloom. Cambridge: The MIT Press, 1993. 174-221.
- Goldin-Meadow, S. and Mylander, C. (1990) "Beyond the input given: The child's role in the acquisition of language." Language, 66, 2. Rpt. in Language Acquisition. Ed. Paul Bloom. Cambridge: The MIT Press, 1993. 507-542.
- Huttenlocher, J. and Smiley, P. (1987) "Early word meanings: The case of object names." Cognitive Psychology, 19. Rpt. in Language Acquisition. Ed. Paul Bloom. Cambridge: The MIT Press, 1993. 222-247.
- Jackendoff, R. (1994) Patterns in the Mind: Language and Human Nature. New York: HarperCollins.
- Kuhl, P. (1993) "Early linguistic experience and phonetic perception: implications for theories of developmental speech perception." Journal of Phonetics, 21, 125-139.
- Markman, E. (1990) "Constraints children place on word meanings." Cognitive Science, 14. Rpt. in Language Acquisition. Ed. Paul Bloom. Cambridge: The MIT Press. 154-173.
- Pinker, S. (1994) The Language Instinct: How the Mind Creates Language. New York: HarperPerennial.