DOWNLOAD PDF V. 1. LANGUAGE IN COGNITION.

Chapter 1 : Language in Cognition : Pieter A. M. Seuren :

Interaction between language and cognition remains an unsolved scientific problem. What are the differences in neural mechanisms of language and cognition? Why do children acquire language by the age of six, while taking a lifetime to acquire cognition? What is the role of language and cognition in.

Find articles by Leonid Perlovsky Kuniyoshi L. Sakai Find articles by Kuniyoshi L. Edited and reviewed by: The use, distribution or reproduction in other forums is permitted, provided the original author s or licensor are credited and that the original publication in this journal is cited, in accordance with accepted academic practice. No use, distribution or reproduction is permitted which does not comply with these terms. Interaction between language and cognition remains an unsolved scientific problem. What are the differences in neural mechanisms of language and cognition? Why do children acquire language by the age of six, while taking a lifetime to acquire cognition? What is the role of language and cognition in thinking? Is abstract cognition possible without language? Is language just a communication device, or is it fundamental in developing thoughts? Why are there no animals with human thinking but without human language? Combinations even among words and objects multiple words can represent multiple objects exceed the number of all the particles in the Universe, and it seems that no amount of experience would suffice to learn these associations. How does human brain overcome this difficulty? What new knowledge about the brain regions responsible for language and cognition has been found with fMRI and other brain imaging methods? What can be inferred about their interactions and functions in language and cognition? Why does the human brain show hemispheric i. Is linguistic and cognitive comprehension processed in the same or different regions? Do the syntactic processes affect the structure of our conceptual world? Such issues regarding brain functions and mind have been increasingly drawing attention from various fields in recent years, and investigations that go beyond the boundaries of previous fields of study are becoming necessary. The need for study spanning the brain and the mind has given birth to a new discipline, such as cognitive neuroscience, neurolinguistics, biolinguistics, etc. We assume that mind is a part of brain function, and we tentatively define the mind as a combination of three main cognitive factors: Language is created by mind, yet, once uttered, words return to the mind, where they are understood. The cycle from the mind to the language and then from the language to the mind, is recursive, in that the language produced by the mind comes back to the mind once again. This recursiveness is important when considering the relationship between language and mind. When viewed language and mind as a whole system, it is evident that the functions of language are part of the brain system at the same time as being involved in the workings of the mind. Moreover, information is exchanged between language and each of perception, memory, and consciousness in both directions. Namely, language is involved in both reciprocal and recursive information exchange with each element of the mind. Since language is tightly linked to the mind, it would be more natural to assume that language is a part of the mind than to think it is an entity which exits outside the mind. The more we study the language used by humans, the more we will understand the structure of the mind. Chomsky has suggested that language is separable from cognition Berwick et al. On the opposite, cognitive and construction linguistics emphasized a single mechanism of both. Neither has led to a computational theory so far, but language is learned early in life with only limited cognitive understanding of the world Perlovsky, Evolutionary linguistics has emphasized evolution leading to a mechanism of language acquisition, yet proposed approaches also lead to incomputable complexity. Papers in this volume report new knowledge on interacting language and cognition, still there remains more questions than answers. In animals, emotional and conceptual contents of voice sounds are fused. Evolution of human language has demanded splitting of emotional and conceptual contents, as well as of their mechanisms, although language prosody still carries emotional content. Is it a dying-off remnant, or is it fundamental for interaction between language and cognition? If language and cognitive mechanisms differ, unifying these two contents requires motivation, hence emotions. What are these emotions? Can they be measured? If tonal languages use pitch contours for semantic contents, are there differences in language-cognition interaction among tonal and atonal languages? Are emotional differences among cultures exclusively cultural, or also depend on languages? This volume

introduces a broad range of research addressing these topics, including three opinion articles, one hypothesis and theory article, eight original research articles, and a pair of an opinion article and a general commentary article. Their summaries are as follows. First, Perlovsky introduces joint acquisition, dual hierarchy, and emotional prosody of language and cognition, such that emotional prosody may perform a fundamental function in connecting sounds and meanings of words. Vicario discusses about FOXP2 gene and language development, which might inform us about the origin of language. Perry and Lupyan explain that language and thought are different but strongly interacting abilities, based on the online manipulation of linguistic activity. Next, Ohta et al. De La Cruz et al. Tilles and Fontanari examine reinforcement and inference in cross-situational word learning. Shuai and Gong analyze temporal relationships between top-down and bottom-up processing in lexical tone perception. Vicario and Rumiati demonstrate how notions of left and right affect processing of trading verbs. We end the volume with a highly-popular discussion on the role of open access publications in linguistics, contributed by Haspelmath and Bragazzi Conflict of interest statement The authors declare that the research was conducted in the absence of any commercial or financial relationships that could be construed as a potential conflict of interest. Evolution, brain, and the nature of language. The importance of open access publishing in the field of Linguistics for spreading scholarly knowledge and preserving languages diversity in the era of the economic financial crisis. Making fingers and words count in a cognitive robot. Why open-access publication should be nonprofitâ€”a view from the field of theoretical language science. The role of semantic abstractness and perceptual category in processing speech accompanied by gestures. Neural substrates of figurative language during natural speech perception: Computational principles of syntax in the regions specialized for language: Language and cognitionâ€”joint acquisition, dual hierarchy, and emotional prosody. What the online manipulation of linguistic activity can tell us about language and thought. Language acquisition and brain development. Temporal relation between top-down and bottom-up processing in lexical tone perception. Supramodal neural processing of abstract information conveyed by speech and gesture. Reinforcement and inference in cross-situational word learning. FOXP2 gene and language development: Left-right compatibility in the processing of trading verbs. Toward a self-organizing pre-symbolic neural model representing sensorimotor primitives.

Chapter 2 : Home â€" Language and Cognition â€" Max Planck Institute for Psycholinguistics

Learn about theories of the relationship between language and cognition. By Carole Yue. Created by Carole Yue. Watch the next lesson: www.nxgvision.comademy.

Whereas other species do communicate with an innate ability to produce a limited number of meaningful vocalizations e. This ability is remarkable in itself. What makes it even more remarkable is that researchers are finding evidence for mastery of this complex skill in increasingly younger children. Infants as young as 12 months are reported to have sensitivity to the grammar needed to understand causative sentences who did what to whom; e. After more than 60 years of research into child language development, the mechanism that enables children to segment syllables and words out of the strings of sounds they hear, and to acquire grammar to understand and produce language is still quite an enigma. Early Theories One of the earliest scientific explanations of language acquisition was provided by Skinner As one of the pioneers of behaviorism , he accounted for language development by means of environmental influence. Skinner argued that children learn language based on behaviorist reinforcement principles by associating words with meanings. Correct utterances are positively reinforced when the child realizes the communicative value of words and phrases. Consequently, he proposed the theory of Universal Grammar: Universal Grammar is considered to contain all the grammatical information needed to combine these categories, e. For example, according to the Universal Grammar account, children instinctively know how to combine a noun e. This Chomskian approach to language acquisition has inspired hundreds of scholars to investigate the nature of these assumed grammatical categories and the research is still ongoing. Contemporary Research A decade or two later some psycho linguists began to question the existence of Universal Grammar. They argued that categories like noun and verb are biologically, evolutionarily and psychologically implausible and that the field called for an account that can explain for the acquisition process without innate categories. Researchers started to suggest that instead of having a language-specific mechanism for language processing, children might utilise general cognitive and learning principles. Whereas researchers approaching the language acquisition problem from the perspective of Universal Grammar argue for early full productivity, i. It is suggested that children are sensitive to patterns in language which enables the acquisition process. An example of this gradual pattern learning is morphology acquisition. Morphemes are the smallest grammatical markers, or units, in language that alter words. In English, regular plurals are marked with an â€"s morpheme e. Children are considered to acquire their first instances of third singular forms as entire phrasal chunks Daddy kicks, a girl eats, a dog barks without the ability of teasing the finest grammatical components apart. When the child hears a sufficient number of instances of a linguistic construction i. In this case, the repeated pattern is the â€"s marker in this particular verb form. Approaching language acquisition from the perspective of general cognitive processing is an economical account of how children can learn their first language without an excessive biolinguistic mechanism. Conclusion However, finding a solid answer to the problem of language acquisition is far from being over. Our current understanding of the developmental process is still immature. Investigators of Universal Grammar are still trying to convince that language is a task too demanding to acquire without specific innate equipment, whereas the constructivist researchers are fiercely arguing for the importance of linguistic input. The biggest questions, however, are yet unanswered. How much does the child need to be exposed to language to achieve the adult-like state? What account can explain variation between languages and the language acquisition process in children acquiring very different languages to English? The mystery of language acquisition is granted to keep psychologists and linguists alike astonished a decade after decade. Aspects of the Theory of Syntax. Journal of Child Language, 35 1: Evidence from the dative. Language Learning and Development, 7 1: Journal of Child Language, 32 2: The New Science of Language and Mind. How to reference this article:

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In addition to facilitating cross-cultural communication, this trend also positively affects cognitive abilities. Researchers have shown that the bilingual brain can have better attention and task-switching capacities than the monolingual brain, thanks to its developed ability to inhibit one language while using another. In addition, bilingualism has positive effects at both ends of the age spectrum: Bilingual children as young as seven months can better adjust to environmental changes, while bilingual seniors can experience less cognitive decline. We are surrounded by language during nearly every waking moment of our lives. We use language to communicate our thoughts and feelings, to connect with others and identify with our culture, and to understand the world around us. And for many people, this rich linguistic environment involves not just one language but two or more. In a survey conducted by the European Commission in , 56 percent of respondents reported being able to speak in a language other than their mother tongue. In many countries that percentage is even higherâ€”for instance, 99 percent of Luxembourgers and 95 percent of Latvians speak more than one language. Europe and the United States are not alone, either. For bilingual people, this activation is not limited to a single language; auditory input activates corresponding words regardless of the language to which they belong. We tend to look at things that we are thinking, talking, or hearing about. Furthermore, language co-activation is so automatic that people consider words in both languages even without overt similarity. For example, when Chinese-English bilingual people judge how alike two English words are in meaning, their brain responses are affected by whether or not the Chinese translations of those words are written similarly. Having to deal with this persistent linguistic competition can result in language difficulties. From a communicative standpoint, this is an important skillâ€” understanding a message in one language can be difficult if your other language always interferes. To maintain the relative balance between two languages, the bilingual brain relies on executive functions, a regulatory system of general cognitive abilities that includes processes such as attention and inhibition. This constant practice strengthens the control mechanisms and changes the associated brain regions. When the color and the word match i. The cognitive system must employ additional resources to ignore the irrelevant word and focus on the relevant color. The ability to ignore competing perceptual information and focus on the relevant aspects of the input is called inhibitory control. Bilingual people often perform better than monolingual people at tasks that tap into inhibitory control ability. Bilingual people are also better than monolingual people at switching between two tasks; for example, when bilinguals have to switch from categorizing objects by color red or green to categorizing them by shape circle or triangle , they do so more rapidly than monolingual people, 13 reflecting better cognitive control when changing strategies on the fly. For instance, when bilingual people have to switch between naming pictures in Spanish and naming them in English, they show increased activation in the dorsolateral prefrontal cortex DLPFC , a brain region associated with cognitive skills like attention and inhibition. When monolingual and bilingual adolescents listen to simple speech sounds e. To put it another way, in bilingual people, blood flow a marker for neuronal activity is greater in the brain stem in response to the sound. Intriguingly, this boost in sound encoding appears to be related to advantages in auditory attention. The cognitive control required to manage multiple languages appears to have broad effects on neurological function, fine-tuning both cognitive control mechanisms and sensory processes. Higher proficiency in a second language, as well as earlier acquisition of that language, correlates with higher gray matter volume in the left inferior parietal cortex. Likewise, researchers have found white matter volume changes in bilingual children 20 and older adults. The improvements in cognitive and sensory processing driven by bilingual experience may help a bilingual person to better process information in the environment, leading to a clearer signal for learning. This kind of improved attention to detail may help explain why bilingual adults learn a third language better than monolingual adults learn a second language. Furthermore, the benefits associated with bilingual experience seem to start quite earlyâ€”researchers have shown bilingualism to positively influence attention and conflict management in infants as young as seven months. In one study, researchers taught babies growing up in

monolingual or bilingual homes that when they heard a tinkling sound, a puppet appeared on one side of a screen. Halfway through the study, the puppet began appearing on the opposite side of the screen. Protecting Against Age-Related Decline The cognitive and neurological benefits of bilingualism also extend into older adulthood. Bilingual experience may contribute to this reserve by keeping the cognitive mechanisms sharp and helping to recruit alternate brain networks to compensate for those that become damaged during aging. Older bilingual people enjoy improved memory 26 and executive control9 relative to older monolingual people, which can lead to real-world health benefits. Likewise, bilingual patients were diagnosed 4. If the brain is an engine, bilingualism may help to improve its mileage, allowing it to go farther on the same amount of fuel. Conclusion The cognitive and neurological benefits of bilingualism extend from early childhood to old age as the brain more efficiently processes information and staves off cognitive decline. Despite certain linguistic limitations that have been observed in bilinguals e. The cognitive, neural, and social advantages observed in bilingual people highlight the need to consider how bilingualism shapes the activity and the architecture of the brain, and ultimately how language is represented in the human mind, especially since the majority of speakers in the world experience life through more than one language.

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Chapter 4 : SparkNotes: Language and Cognition: Theories of Language Acquisition

Language and Cognition is a venue for the publication of high quality peer-reviewed research of a theoretical and/or empirical/experimental nature, focusing on the interface between language and cognition.

Viorica Marian , Ph. Marian received a Ph. Marian directs the Bilingualism and Psycholinguistics Laboratory and uses cognitive, behavioral, and neurological measures to study human language capacity and the consequences of bilingualism for linguistic, cognitive, and neural function. Anthony Shook is a doctoral candidate in the department of communication sciences and disorders at Northwestern University. His research investigates bilingualism and what it can reveal about language, with a focus on how two or more languages interact at multiple levels of processing and the effect of this interaction on the language system. Shook uses behavioral and neurological methods, as well as computational modeling, to explore the form and architecture of the bilingual language comprehension system. In addition to facilitating cross-cultural communication, this trend also positively affects cognitive abilities. Researchers have shown that the bilingual brain can have better attention and task-switching capacities than the monolingual brain, thanks to its developed ability to inhibit one language while using another. In addition, bilingualism has positive effects at both ends of the age spectrum: Bilingual children as young as seven months can better adjust to environmental changes, while bilingual seniors can experience less cognitive decline. We are surrounded by language during nearly every waking moment of our lives. We use language to communicate our thoughts and feelings, to connect with others and identify with our culture, and to understand the world around us. And for many people, this rich linguistic environment involves not just one language but two or more. In a survey conducted by the European Commission in , 56 percent of respondents reported being able to speak in a language other than their mother tongue. In many countries that percentage is even higherâ€”for instance, 99 percent of Luxembourgers and 95 percent of Latvians speak more than one language. Europe and the United States are not alone, either. Open in a separate window Cognitive Consequences of Bilingualism Research has overwhelmingly shown that when a bilingual person uses one language, the other is active at the same time. For bilingual people, this activation is not limited to a single language; auditory input activates corresponding words regardless of the language to which they belong. We tend to look at things that we are thinking, talking, or hearing about. Furthermore, language co-activation is so automatic that people consider words in both languages even without overt similarity. For example, when Chinese-English bilingual people judge how alike two English words are in meaning, their brain responses are affected by whether or not the Chinese translations of those words are written similarly. Having to deal with this persistent linguistic competition can result in language difficulties. From a communicative standpoint, this is an important skillâ€”understanding a message in one language can be difficult if your other language always interferes. To maintain the relative balance between two languages, the bilingual brain relies on executive functions, a regulatory system of general cognitive abilities that includes processes such as attention and inhibition. This constant practice strengthens the control mechanisms and changes the associated brain regions. When the color and the word match i. The cognitive system must employ additional resources to ignore the irrelevant word and focus on the relevant color. The ability to ignore competing perceptual information and focus on the relevant aspects of the input is called inhibitory control. Bilingual people often perform better than monolingual people at tasks that tap into inhibitory control ability. Bilingual people are also better than monolingual people at switching between two tasks; for example, when bilinguals have to switch from categorizing objects by color red or green to categorizing them by shape circle or triangle , they do so more rapidly than monolingual people, 13 reflecting better cognitive control when changing strategies on the fly. For instance, when bilingual people have to switch between naming pictures in Spanish and naming them in English, they show increased activation in the dorsolateral prefrontal cortex DLPFC , a brain region associated with cognitive skills like attention and inhibition. When monolingual and bilingual adolescents listen to simple speech sounds e. To put it another way, in bilingual people, blood flow a marker for neuronal activity is greater in the brain stem in response to the sound. Intriguingly, this boost in sound encoding appears to be related to advantages in

auditory attention. The cognitive control required to manage multiple languages appears to have broad effects on neurological function, fine-tuning both cognitive control mechanisms and sensory processes. Higher proficiency in a second language, as well as earlier acquisition of that language, correlates with higher gray matter volume in the left inferior parietal cortex. Likewise, researchers have found white matter volume changes in bilingual children 20 and older adults. Improvements in Learning Being bilingual can have tangible practical benefits. The improvements in cognitive and sensory processing driven by bilingual experience may help a bilingual person to better process information in the environment, leading to a clearer signal for learning. This kind of improved attention to detail may help explain why bilingual adults learn a third language better than monolingual adults learn a second language. Furthermore, the benefits associated with bilingual experience seem to start quite earlyâ€"researchers have shown bilingualism to positively influence attention and conflict management in infants as young as seven months. In one study, researchers taught babies growing up in monolingual or bilingual homes that when they heard a tinkling sound, a puppet appeared on one side of a screen. Halfway through the study, the puppet began appearing on the opposite side of the screen. Protecting Against Age-Related Decline The cognitive and neurological benefits of bilingualism also extend into older adulthood. Bilingual experience may contribute to this reserve by keeping the cognitive mechanisms sharp and helping to recruit alternate brain networks to compensate for those that become damaged during aging. Older bilingual people enjoy improved memory 26 and executive control 9 relative to older monolingual people, which can lead to real-world health benefits. Likewise, bilingual patients were diagnosed 4. If the brain is an engine, bilingualism may help to improve its mileage, allowing it to go farther on the same amount of fuel. Conclusion The cognitive and neurological benefits of bilingualism extend from early childhood to old age as the brain more efficiently processes information and staves off cognitive decline. Despite certain linguistic limitations that have been observed in bilinguals e. The cognitive, neural, and social advantages observed in bilingual people highlight the need to consider how bilingualism shapes the activity and the architecture of the brain, and ultimately how language is represented in the human mind, especially since the majority of speakers in the world experience life through more than one language. Footnotes Article available online at http: European Commission Special Eurobarometer Europeans and their languages. Retrieved October 1, , from http: Marian V, Spivey M. Bilingual and monolingual processing of competing lexical items. Eye movements and lexical access in spoken-language comprehension: Evaluating a linking hypothesis between fixations and linguistic processing. Journal of Psycholinguistic Research. Thierry G, Wu YJ. Brain potentials reveal unconscious translation during foreign-language comprehension. Bilingualism affects picture naming but not picture classification. What is a TOT? Cognate and translation effects on tip-of-the-tongue states in Spanish-English and Tagalog-English bilinguals. Journal of Experimental Psychology: Learning, Memory, and Cognition. Consequences for mind and brain. Trends in Cognitive Sciences. Language control and lexical competition in bilinguals: An event-related fMRI study. Bilingualism tunes the anterior cingulate cortex for conflict monitoring. Cook V, Bassetti B, editors. Language and bilingual cognition. Prior A, MacWhinney B. A bilingual advantage in task switching. In search of the language switch: Abutalebi J, Green DW. Control mechanisms in bilingual language production: Neural evidence from language switching studies. Language and Cognitive Processes. Bridging language and attention: Brain basis of the impact of bilingualism on cognitive control. Subcortical encoding of sound is enhanced in bilinguals and relates to executive function advantages. Structural plasticity in the bilingual brain. Pathological switching between languages after frontal lesions in a bilingual patient. Journal of Neurology, Neurosurgery, and Psychiatry. DTI reveals structural differences in white matter tracts between bilingual and monolingual children. Lifelong bilingualism maintains white matter integrity in older adults. Kaushanskaya M, Marian V. The bilingual advantage in novel word learning. Psychonomic Bulletin and Review. Bartolotti J, Marian V. Language learning and control in monolinguals and bilinguals. Kovacs AM, Mehler J. Cognitive gains in 7-month-old bilingual infants. Delaying the onset of Alzheimer disease: Bilingualism as a form of cognitive reserve. Schroeder SR, Marian V. A bilingual advantage for episodic memory in older adults.

Chapter 5 : Language and Cognition

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These arguments lean towards the "nurture" side of the argument: Since operant conditioning is contingent on reinforcement by rewards, a child would learn that a specific combination of sounds stands for a specific thing through repeated successful associations made between the two. Some empiricist theories of language acquisition include the statistical learning theory. Hockett of language acquisition, relational frame theory , functionalist linguistics , social interactionist theory , and usage-based language acquisition. Instead, children typically follow a pattern of using an irregular form of a word correctly, making errors later on, and eventually returning to the proper use of the word. For example, a child may correctly learn the word "gave" past tense of "give" , and later on use the word "gived". Eventually, the child will typically go back to learning the correct word, "gave". Chomsky argued that if language were solely acquired through behavioral conditioning, children would not likely learn the proper use of a word and suddenly use the word incorrectly. Chomsky also rejected the term "learning", which Skinner used to claim that children "learn" language through operant conditioning. The language immersion school, operated by the Eastern Band of Cherokee Indians , teaches the same curriculum as other American primary schools , but the Cherokee language is the medium of instruction from pre-school on up and students learn it as a first language. Such schools have proven instrumental in the preservation and perpetuation of the Cherokee language. A major debate in understanding language acquisition is how these capacities are picked up by infants from the linguistic input. Nativists such as Noam Chomsky have focused on the hugely complex nature of human grammars, the finiteness and ambiguity of the input that children receive, and the relatively limited cognitive abilities of an infant. From these characteristics, they conclude that the process of language acquisition in infants must be tightly constrained and guided by the biologically given characteristics of the human brain. Otherwise, they argue, it is extremely difficult to explain how children, within the first five years of life, routinely master the complex, largely tacit grammatical rules of their native language. In particular, there has been resistance to the possibility that human biology includes any form of specialization for language. This conflict is often referred to as the " nature and nurture " debate. Of course, most scholars acknowledge that certain aspects of language acquisition must result from the specific ways in which the human brain is "wired" a "nature" component, which accounts for the failure of non-human species to acquire human languages and that certain others are shaped by the particular language environment in which a person is raised a "nurture" component, which accounts for the fact that humans raised in different societies acquire different languages. The as-yet unresolved question is the extent to which the specific cognitive capacities in the "nature" component are also used outside of language. Social interactionist theory Social interactionist theory is an explanation of language development emphasizing the role of social interaction between the developing child and linguistically knowledgeable adults. It is based largely on the socio-cultural theories of Soviet psychologist Lev Vygotsky , and made prominent in the Western world by Jerome Bruner. Another key idea within the theory of social interactionism is that of the zone of proximal development. Briefly, this is a theoretical construct denoting the set of tasks a child is capable of performing with guidance, but not alone. Relational frame theory[edit] Main article: Based upon the principles of Skinnerian behaviorism , RFT posits that children acquire language purely through interacting with the environment. RFT theorists introduced the concept of functional contextualism in language learning, which emphasizes the importance of predicting and influencing psychological events, such as thoughts, feelings, and behaviors, by focusing on manipulable variables in their context. Empirical studies supporting the predictions of RFT suggest that children learn language via a system of inherent reinforcements, challenging the view that language acquisition is based upon innate, language-specific cognitive capacities. According to these theories, neither nature nor nurture alone is sufficient to trigger language learning; both of these influences must work together in order to allow children to acquire a language. The proponents of these theories argue that general cognitive processes subserve language

acquisition and that the end result of these processes is language-specific phenomena, such as word learning and grammar acquisition. The findings of many empirical studies support the predictions of these theories, suggesting that language acquisition is a more complex process than many believe. In the s within the Principles and Parameters framework, this hypothesis was extended into a maturation-based Structure building model of child language regarding the acquisition of functional categories. In this model, children are seen as gradually building up more and more complex structures, with Lexical categories like noun and verb being acquired before Functional- syntactic categories like determiner and complementiser. One influential proposal to the origin of these errors is as follows: In Bare-Phrase structure Minimalist Program , since theory-internal considerations define the specifier position of an internal-merge projection phases vP and CP as the only type of host which could serve as potential landing-sites for move-based elements displaced from lower down within the base-generated VP structure â€" e. Internal-merge second-merge establishes more formal aspects related to edge-properties of scope and discourse-related material pegged to CP. See Roeper for a full discussion of recursion in child language acquisition. The Pisa Lectures , the acquisition of syntax resembles ordering from a menu: An especially dramatic example is provided by children who, for medical reasons, are unable to produce speech and, therefore, can never be corrected for a grammatical error but nonetheless, converge on the same grammar as their typically developing peers, according to comprehension-based tests of grammar. Binary parameters are common to digital computers, but may not be applicable to neurological systems such as the human brain. It is unclear that human language is actually anything like the generative conception of it. Since language, as imagined by nativists, is unlearnably complex,[citation needed] subscribers to this theory argue that it must, therefore, be innate. While all theories of language acquisition posit some degree of innateness, they vary in how much value they place on this innate capacity to acquire language. Empiricism places less value on the innate knowledge, arguing instead that the input, combined with both general and language-specific learning capacities, is sufficient for acquisition. The anti-nativist view has many strands, but a frequent theme is that language emerges from usage in social contexts, using learning mechanisms that are a part of a general cognitive learning apparatus which is what is innate. This position has been championed by David M. Philosophers, such as Fiona Cowie [47] and Barbara Scholz with Geoffrey Pullum [48] have also argued against certain nativist claims in support of empiricism. The new field of cognitive linguistics has emerged as a specific counter to Chomskian Generative Grammar and Nativism. Statistical learning in language acquisition Some language acquisition researchers, such as Elissa Newport , Richard Aslin, and Jenny Saffran , emphasize the possible roles of general learning mechanisms, especially statistical learning, in language acquisition. These findings suggest that early experience listening to language is critical to vocabulary acquisition. From the perspective of that debate, an important question is whether statistical learning can, by itself, serve as an alternative to nativist explanations for the grammatical constraints of human language. Chunking[edit] Chunking theories of language acquisition constitute a group of theories related to statistical learning theories, in that they assume the input from the environment plays an essential role; however, they postulate different learning mechanisms. The central idea of these theories is that language development occurs through the incremental acquisition of meaningful chunks of elementary constituents , which can be words, phonemes , or syllables. Recently, this approach has been highly successful in simulating several phenomena in the acquisition of syntactic categories [57] and the acquisition of phonological knowledge. They showed that toddlers develop their own individual rules for speaking with slots, into which they could put certain kinds of words. A significant outcome of the research was that rules inferred from toddler speech were better predictors of subsequent speech than traditional grammars. Language acquisition almost always occurs in children during a period of rapid increase in brain volume. At this point in development, a child has many more neural connections than he or she will have as an adult, allowing for the child to be more able to learn new things than he or she would be as an adult. It has been determined, through empirical research on developmentally normal children, as well as through some extreme cases of language deprivation, that there is a " sensitive period " of language acquisition in which human infants have the ability to learn any language. Several findings have observed that from birth until the age of six months, infants can discriminate the phonetic contrasts of all languages. Researchers believe that this gives infants the ability to

acquire the language spoken around them. After such an age, the child is able to perceive only the phonemes specific to the language learned. The reduced phonemic sensitivity enables children to build phonemic categories and recognize stress patterns and sound combinations specific to the language they are acquiring. In the ensuing years much is written, and the writing is normally never erased. After the age of ten or twelve, the general functional connections have been established and fixed for the speech cortex. Deaf children who acquire their first language later in life show lower performance in complex aspects of grammar. Researchers are unable to experimentally test the effects of the sensitive period of development on language acquisition, because it would be unethical to deprive children of language until this period is over. However, case studies on abused, language deprived children show that they were extremely limited in their language skills, even after instruction. However, during infancy, children begin to babble. Deaf babies babble in the same order when hearing sounds as non-deaf babies do, thus showing that babbling is not caused by babies simply imitating certain sounds, but is actually a natural part of the process of language development. However, deaf babies do often babble less than non-deaf babies and they begin to babble later on in infancy begin babbling at 11 months as compared to 6 months when compared to non-deaf babies. There have been many different studies examining different modes of language acquisition prior to birth. The study of language acquisition in fetuses started back in the late s when different researchers discovered that very young infants could discriminate their native language from other languages. In Mehler et al. These results suggest there are mechanisms for fetal auditory learning, and other researchers have found further behavioral evidence to support this notion. Fetus auditory learning through environment habituation has been seen in a variety of different modes, such as: Some researchers in the field of developmental neuroscience would argue that fetal auditory learning mechanisms are solely due to discrimination in prosodic elements. Although this would hold merit in an evolutionary psychology perspective i. This ability to sequence specific vowels gives newborn infants some of the fundamental mechanisms needed in order to learn the complex organization of a language. From a neuroscientific perspective, there are neural correlates have been found that demonstrate human fetal learning of speech-like auditory stimulus that most other studies have been analyzing Partanen et al. In this same study, there was "a significant correlation existed between the amount of prenatal exposure and brain activity, with greater activity being associated with a higher amount of prenatal speech exposure," pointing to the important learning mechanisms present before birth that is fine-tuned to features in speech Partanen et al. Before anything the learner needs to be able to hear what they are attempting to pronounce. Another is the capacity to engage in speech repetition. If a child knows fifty words or less by the age of 24 months, he or she is classified as a late-talker and future language development, like vocabulary expansion and the organization of grammar, is likely to be slower and stunted. Word segmentation, or the segmentation of words and syllables from fluent speech can be accomplished by eight-month-old infants. Specifically, learning to sit independently between 3 and 5 months has been found to predict receptive vocabulary at both 10 and 14 months of age, [90] and independent walking skills have been found to correlate with language skills around 10 to 14 months of age. Studies have also shown a correlation between Socio-Economic-Status and vocabulary acquisition. It has been proposed that children acquire these meanings with the use of processes modeled by latent semantic analysis ; that is, when they meet an unfamiliar word, children can use information in its context to correctly guess its rough area of meaning. Markman and others have proposed that children assume words to refer to objects with similar properties "cow" and "pig" might both be "animals" rather than to objects that are thematically related "cow" and "milk" are probably not both "animals". In terms of genetics, the gene ROBO1 has been associated with phonological buffer integrity or length. Kuniyoshi Sakai proposed, based on several neuroimaging studies, that there may be a "grammar center", where language is primarily processed in the left lateral premotor cortex located near the pre central sulcus and the inferior frontal sulcus. Additionally, these studies proposed that first language and second-language acquisition may be represented differently in the cortex. Even the number of times an examinee blinked was taken into account during the examination process. It was concluded that the brain does in fact process languages differently, but instead of it being directly related to proficiency levels, it is more so about how the brain processes language itself. The specialization of these language centers is so extensive that damage to them results in a critical condition known as aphasia.

Chapter 6 : Language Acquisition Theory | Simply Psychology

Language in Cognition argues that language is based on the human construal of reality. Humans refer to and quantify over virtual entities with the same ease as they do over actual entities: the natural ontology of language, the author argues, must therefore comprise both actual and virtual entities and situations.

The goal is to develop object permanence; achieves basic understanding of causality, time, and space. Pre-operational stage Toddler and Early Childhood 2â€”7 years Symbols or language skills are present; memory and imagination are developed; nonreversible and nonlogical thinking; shows intuitive problem solving; begins to see relationships; grasps concept of conservation of numbers; egocentric thinking predominates. Concrete operational stage Elementary and Early Adolescence 7â€”12 years Logical and systematic form of intelligence; manipulation of symbols related to concrete objects; thinking is now characterized by reversibility and the ability to take the role of another; grasps concepts of the conservation of mass, length, weight, and volume; operational thinking predominates nonreversible and egocentric thinking Formal operational stage Adolescence and Adulthood 12 years and on Logical use of symbols related to abstract concepts; Acquires flexibility in thinking as well as the capacities for abstract thinking and mental hypothesis testing; can consider possible alternatives in complex reasoning and problem solving. Consequently, information given in the middle of the sequence is typically forgotten, or not recalled as easily. This study predicts that the recency effect is stronger than the primacy effect, because the information that is most recently learned is still in working memory when asked to be recalled. Information that is learned first still has to go through a retrieval process. This experiment focuses on human memory processes. By theory, the subject should be better able to correctly recall the letter when it was presented in a word than when it was presented in isolation. This experiment focuses on human speech and language. After the distractor task, they are asked to recall the trigram from before the distractor task. In theory, the longer the distractor task, the harder it will be for participants to correctly recall the trigram. This experiment focuses on human short-term memory. After being presented with the stimuli, the subject is asked to recall the sequence of stimuli that they were given in the exact order in which it was given. In one particular version of the experiment, if the subject recalled a list correctly, the list length was increased by one for that type of material, and vice versa if it was recalled incorrectly. The theory is that people have a memory span of about seven items for numbers, the same for letters that sound dissimilar and short words. The memory span is projected to be shorter with letters that sound similar and with longer words. The participant is to identify whether there is a green circle on the window. In the "featured" search, the subject is presented with several trial windows that have blue squares or circles and one green circle or no green circle in it at all. In the "conjunctive" search, the subject is presented with trial windows that have blue circles or green squares and a present or absent green circle whose presence the participant is asked to identify. What is expected is that in the feature searches, reaction time, that is the time it takes for a participant to identify whether a green circle is present or not, should not change as the number of distractors increases. Conjunctive searches where the target is absent should have a longer reaction time than the conjunctive searches where the target is present. The theory is that in feature searches, it is easy to spot the target, or if it is absent, because of the difference in color between the target and the distractors. In conjunctive searches where the target is absent, reaction time increases because the subject has to look at each shape to determine whether it is the target or not because some of the distractors if not all of them, are the same color as the target stimuli. Conjunctive searches where the target is present take less time because if the target is found, the search between each shape stops. One of the oldest paradigms is the leveling and sharpening of stories as they are repeated from memory studied by Bartlett. The semantic differential used factor analysis to determine the main meanings of words, finding that value or "goodness" of words is the first factor. More controlled experiments examine the categorical relationships of words in free recall. More dynamic models of semantic networks have been created and tested with neural network experiments based on computational systems such as latent semantic analysis LSA , Bayesian analysis, and multidimensional factor analysis. The semantics meaning of words is studied by all the disciplines of cognitive science. The term

comes from the root word meta , meaning "beyond". On the Soul and the Parva Naturalia.

Chapter 7 : Cognition - Wikipedia

The relation between bilingualism and cognition is informative about the connection between language and mind. From the perspective of language, the question is how bilingualism might help or hinder cognition - narrowly interpreted here as executive function.

Chapter 8 : Language acquisition - Wikipedia

Language and cognition are separate and closely related mechanisms of the mind. They evolve jointly in ontological development and learning, and possibly these abilities evolved jointly in evolutionâ€"this we address in more detail in the next section.

Chapter 9 : The Cognitive Benefits of Being Bilingual

LANGUAGE IN COGNITION peter carruthers This chapter reviews some of the ways in which natural language might be impli-cated in human cognition.