

APA DISTINGUISHED SCIENTIFIC CONTRIBUTION AWARD
American Psychological Association Biography
Edward S. Klima

Edward Klima has always had a profound interest in language. He attended Dartmouth College as an undergraduate from 1949 to 1953. In his senior year, he studied linguistics in independent study. After a fellowship year in Iceland, where he learned Icelandic, he began graduate studies in Linguistics at Harvard. There he did old-fashioned historical linguistics --philology-- like most other linguists of that period. 1955-56 was spent studying Hittite in Paris. He loved the city and the French language, but found that he was interested not at all in philology. On returning to Harvard in 1956, he had his first encounter with Roman Jakobson. That made all the difference! Klima was captivated by Jakobson's notions of systematic structural linguistics. In 1957, Jakobson recommended to Noam Chomsky that Klima be hired at MIT in linguistics, the very year Chomsky's short but revolutionary book, Syntactic Structures, appeared. Klima studied it and was convinced that this provided new possibilities for an explanatory theoretical syntax. Klima taught at MIT from 1957 to 1967. His main interests were first generative syntax. Then his interest broadened to formal generative approaches to language change and language acquisition. Those were very eventful years in the MIT-Harvard community. Cognitive science was just beginning. During this period, Klima became consultant to Roger Brown's Language Acquisition Project. Significantly, one of the members of that project was someone with whom Klima was destined to have a much deeper and long-lasting association, both professional and personal, Ursula Bellugi.

Research Program. In 1968, Ed Klima moved to the Linguistics Department at the University of California, San Diego (UCSD). His wife, Ursula Bellugi, moved to The Salk Institute for Biological Studies. As Professor in the Department of Linguistics at UCSD, Klima taught Formal Syntax, Psycholinguistics and Linguistics and Poetics. Later he became Chairman of the Department and Director of the Center for Research on Language. The climate in the San Diego area for Psycholinguistics and Neurosciences was just beginning to warm up. At the time, The Salk Institute was dedicated to Molecular Biology. Jonas Salk, who wanted the Institute to have a broader scope, asked Bellugi if she and Klima would like to set up a small laboratory, and so they began considering their issues in a biological context. They decided to examine the biological foundations of language acquisition by comparing hearing children learning spoken language with deaf children of deaf parents exposed from birth to signed communication systems. They started in 1970, with a small grant, and many questions about the hand waving that they saw but didn't understand, little imagining at that time the directions this research would lead to. Bellugi and Klima initiated a tandem study of the structure

of American Sign Language (ASL) and the course of its acquisition as a native language by deaf children of deaf parents.

Neither Klima nor Bellugi had any previous knowledge of a sign language, nor had they had anything more than a passing contact with deaf people. The extant literature generally suggested that either sign language was a loose collection of pantomimic gestures or some form of “broken English on the hands.” Their basic questions were: Does the gesturing that deaf people use to communicate with one another constitute anything like a language? If so, does it have similar or different organizational properties to spoken languages? Furthermore, how do these principles emerge in the language-acquiring child? A decade of experimental and linguistic research with a growing research team culminated in their book, The Signs of Language. The research revealed that there are primary linguistic systems, passed down from one generation of deaf people to the next, which have been forged into autonomous languages with complex grammatical properties not derived from spoken languages. Their studies found that ASL was in fact a complexly structured language, with a highly articulated grammar; a language that exhibits the essential properties shared by spoken languages, including phonology without sound, and complex structuring at the morphological and syntactic levels. But as importantly, their evidence showed that the surface forms in which those properties are manifest are deeply rooted in the modality in which the language is conveyed. A compelling conclusion from the first decade of their research is that the capacity for language is fundamental to the human mind.

Klima’s research questions have expanded exponentially since the early days. Together with Bellugi, they have been recipients of grants since 1970 from the National Institutes of Health and the National Science Foundation, March of Dimes, MacArthur Foundation, Axe Houghton and others. The grants that reflect the scientific directions of the lively 20-member research team in the Klima/Bellugi lab include: “Language, Modality and the Brain”; “Brain Organization: Clues from Sign Aphasia”; “The Development of Spatial Language and Spatial Cognition”; “Fractionations between Language and Cognition: Evidence from Williams Syndrome”; “Origins of Communication in Williams Syndrome,” and “Gene Coding in Williams Syndrome.” One realm of research draws upon the observation that a deaf signer is faced with the dual task of spatial perception, spatial memory and transformations on the one hand, and processing grammatical structure on the other -- all in one and the same visual event. Despite the difference in modality, they found that children acquire sign languages according to the same biological time table and go through the same stages as do children acquiring spoken languages. A central question is how visual spatial languages are represented in the brain; given that ASL exhibits complex linguistic structure but conveys much of its structure by manipulating spatial relations. A second critical question is the relation between nonlinguistic spatial cognition and processing a visual spatial language. Klima, Bellugi and colleagues have an experimental program of studies to address these questions, the early results of which are in their book, What the Hands Reveal about the

Brain, co-authored with Howard Poizner. Studies with left and right brain lesioned deaf signers indicate that the left hemisphere has an innate predisposition for language, even for a language in which spatial processing plays a central linguistic role. This capacity of certain brain systems to subserve language, whether spoken or signed, is a striking demonstration of neuronal plasticity.

Currently, Klima, Bellugi and colleagues are engaged in a new line of studies which forges links between specific genetically based neurodevelopmental disorders, unusual neurocognitive profiles and brain organization. Children with Williams Syndrome, a rare metabolic disorder, show an extreme fractionation of higher cognitive functions both within and across domains: linguistic abilities are selectively preserved against a backdrop severe cognitive impairment. Even within spatial cognition, there are striking peaks and valleys of abilities. Moreover, Williams Syndrome appears to leave a distinctive morphological stamp on the brain, as evidence from Neuroanatomic as well as Neurophysiologic studies shows. Thus the unusual neurocognitive profile is accompanied by highly distinctive brain organization. Collaborations with other scientists at UCSD, UCLA and Harvard University allow them to pursue hypotheses about the neurobiological and genetic basis for the disorder. This direction of research, presented recently at a Symposium on Brains, Genes, and Cognition, provides new lines of evidence for understanding the neural systems that subserve language and cognitive functions in humans.

Klima is Professor Emeritus of Linguistics at UCSD. He is also Research Scientist and Adjunct Professor at the Salk Institute for Biological Studies, in the Laboratory of Cognitive Neuroscience. The Bellugi/Klima research team includes hearing and deaf researchers, and ranges from Cognitive Science, Linguistics, Pediatrics, Neurology to Systems Neuroscience, involving collaborations as well with Neurobiology and Gene Expression. Klima has authored more than 100 books, papers, and abstracts. The research stemming from the laboratory has received a number of awards, including a MERIT award from the National Institute of Child Health and Development and a Neuroscience Investigator (Pepper) Award from the National Institute on Deafness and Communicative Disorders. The Signs of Language won an 'Outstanding Book' award from the Association of American Publishers. A conference on Theoretical Issues in Sign Language Research was held in Boston in honor of Klima and Bellugi. Klima received the American Psychological Associations' Distinguished Scientific Career Award, in recognition of his research in 1993, and gave an honorary lecture at the Annual APA meeting in Toronto. The research studies, taken as a whole, permit the exploration of some of the central issues of cognitive neuroscience that tie cognitive function to brain organization.

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