

Zach Baker

COG 356 Person/Contribution assignment - Noam Chomsky



“I was never aware of any other option but to question everything.”

Avram Noam Chomsky was born on December 7, 1928, in Pennsylvania. Growing up, he exposed himself to a significant amount of (left-wing) political literature, and wrote his first article when he was 10, about fascism. Chomsky encountered the linguist Zellig Harris in a political circle while enrolled at the University of Pennsylvania, who convinced him to major in linguistics. After graduating, he went on to achieve his doctorate at Harvard. He disagreed with the behaviorist ideas that were associated with linguistics during this period, and started writing down his own ideas about the logical structure of language, which were influenced by / a continuation of the ideas of Zellig Harris. At this point, these notes were circulated among specialists, about 20 years before they would be published. Through his amicable connections at M.I.T., he started doing some work on campus, and was eventually hired by the institute as an assistant professor. At this time, Chomsky published his first book on linguistics, *Syntactic Structures*, within which he argues for the separation of syntax and semantics, a concept which was received with hostility or indifference within experts of the fields. This book still assisted him, however, in becoming a full professor and establishing the linguistics graduate program at M.I.T. He argued against B.F. Skinner, positing that language is a learned behavior, in a published review in 1959. After this point, Chomsky continued (and continues) to publish books on his theory of language and grammar, and for truly avid Chomsky fans, his most recent political opinions are available on YouTube as well. His most notable contribution to formal systems would likely be the formal grammar systems contained in the Chomsky Hierarchy, as well as the hierarchy itself. These grammars are recursively enumerable, context-sensitive, context-free, and regular grammars. Each grammar is a subclass of each of its predecessors, as listed here, as well as able to be generated by a computationally weaker automaton than its predecessors. A recursively enumerable grammar is a grammar (a set of axioms and generational

rules) for which a Turing machine can list all valid strings. A context-sensitive grammar is a recursively enumerable grammar which uses symbols whose meanings are context-dependent, while a context-free grammar's rules can be applied regardless of the context of its non-terminals (symbols which may be substituted). Lastly, a regular grammar's substitutions must either start (left-regular) or end (right-regular) with a terminal symbol (a symbol with no substitution). These forms of grammar had a tremendous impact on the world of linguistics and cognitive science, as they allowed for the computational description of a language, which was previously thought to be a purely human, or behavioral concept.