PROFILE

Pinker and the Brain

Cognitive scientist Steven Pinker plumbs the evolutionary origins of language and behavior while keeping his detractors at bay

Steven Pinker does not shy away from fights. Over the years, he has taken on feminists, romanticists, psychoanalysts and fellow linguists, including the brilliant Noam Chomsky. But perhaps his most noted clash has been with Stephen Jay Gould, the paleobiologist. The intellectual feud between the two men, which also involves other leading evolutionary theorists, eventually landed on the front page of the *Boston Globe*.

So it is with some sense of trepidation that I meet Pinker, the 44-year-old professor of psychology and director of the Massachusetts Institute of Technology's Center for Cognitive Neuroscience. Entering his home, a beautifully remodeled Victorian house a short walk from Harvard University, I am expecting a churlish gadfly. But I am immediately disarmed by his soft-spoken and affable manner.

Pinker, who was born and raised in Montreal, recalls that a defining moment in his life occurred in the early 1970s, when he was in junior college (a transition between high school and university in Quebec). He happened to read "The Chomskyan Revolution," an article in the *New York Times Magazine* that described Chomsky's theories—in particular, his assertion that all languages have an underlying universal grammar. "It was the first time," Pinker remembers, "that I had heard of language being an innate ability."

The 1970s also marked the coming of another revolution, that of sociobiology, the study of how genes influence social behavior. Championed by biologist Edward O. Wilson, sociobiology attempted to link biology with the social sciences and humanities. Interestingly, Pinker turned his back on the emerging field, his early interest in the connection between biology and language notwithstanding. "I was probably opposed to sociobiology not for any serious reasons, but because everyone I knew was opposed to it," he recalls. "Especially after the Second World War, anything smacking of genes was suspect because of Hitler and eugenics."

So as an undergraduate at McGill University, Pinker opted for a more traditional route, studying cognitive science.

SAM OGDEN

"I found alluring the combination of psychology, computer science, artificial intelligence, the philosophy of mind, and linguistics," he says. In particular, he was impressed with the premise in cognitive science that information—memories, for instance—can be incarnated in matter or, more specifically, neural tissue. He was also attracted to the field's amenability to experimental verification. "Cognitive science," Pinker remarks, "gives you the framework and vocabulary to begin asking questions, and you can then form theories and go out and test them."

He began doing so at Harvard University, where he received a Ph.D. in psychology, and at M.I.T., where he has been since 1982. Pinker poked and prodded at Chomsky's theories, conducting experiments in the laboratory and at day care centers to determine exactly how children acquire language. He observed how toddlers from a very early age make certain errors, for example, in forming the past tenses of irregular verbs ("bringed" instead of "brought"). Such mistakes, Pinker asserted, occurred before the children had processed enough language to have inferred the appropriate rules from scratch. From that and other data, Pinker confirmed that children do indeed have an inborn facility for language, and he developed and tested detailed models for how that mechanism might work. But something was missing. If people have such an innate faculty, how did it get there?

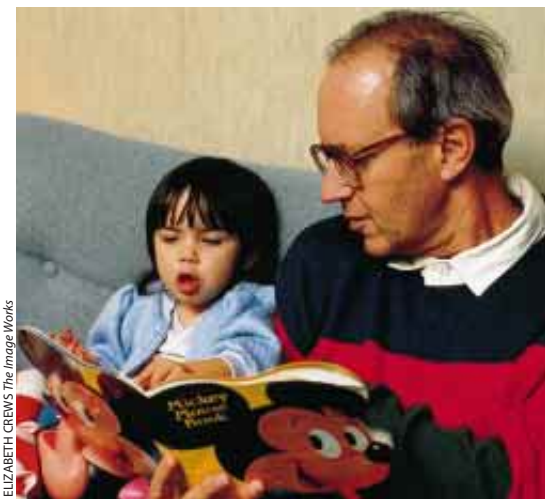
Then, during a sabbatical in the late 1980s, Pinker read Richard Dawkins's *The Selfish Gene* and about two dozen other books on evolutionary biology. "This was the logical next step," he recalls, "going from innate mechanisms such as those for acquiring language and asking, How did those mechanisms get there? And the answer is by the process of evolution." Pinker thus embraced evolutionary psychology, a field that (ironically for him) arose from many of the ideas of sociobiology.

If the human eye is an adaptation—that is, something functionally

STANDING HIS GROUND: Steven Pinker's embrace of evolutionary psychology has put him at odds with intellectual heavyweights such as Stephen Jay Gould and Noam Chomsky.

effective that has evolved through natural selection—then so essentially is the human mind, evolutionary psychologists assert. Thus, various mental faculties, including that for language, and even human behavior might best be understood when viewed in this context, similar to the way in which technicians can reverse-engineer how a VCR works by first knowing what it does. Why, for example, do people fall in love with each other? Rather than a mere social construct, romantic love, evolutionary psychologists contend, evolved biologically as an insurance mechanism to guarantee that both parents stuck around to care for their offspring, thereby assuring continuity of their genes.

Pinker tells me this as we sit at his dining table, which has a full view of his immaculately furnished living room, where every piece of furniture and decorative touch seems to have its place. I suddenly understand how Pinker views the mind: not as a mysterious mess of inexplicable irrationalities but as a system where order and function rule.



ELIZABETH CREW'S *The Image Works*

***LANGUAGE ACQUISITION** in toddlers is facilitated by an innate mechanism of the mind that arose through natural selection, Pinker asserts.*

In 1994, in his first popular book, *The Language Instinct,* Pinker applied that tidy Darwinism to extend Chomsky's theories into adaptationist territory. Three years later he went much further with *How the Mind Works,* building on the work of anthropologist John Tooby, psychologist Leda Cosmides and others. The 660-page tome is an elegantly written tour de force that pulls together developments in cognitive science and evolutionary psychology, synthesizing them into a coherent and cohesive theory. The book did no less than explain a staggering range of phenomena—why people are disgusted at the thought of eating worms, why they have the proclivity for self-deception, why men buy pornography but women don't—all in evolutionary terms.

Pinker's persuasive prose aside, it is easy to see why evolutionary psychology elicits ire. Taken to a fanatic extreme, the field paints a bleak picture of people controlled by their genes. (Incidentally, the dark implications of biological determinism plagued Wilson and sociobiology in the 1970s.) Furthermore, biological differences between the sexes have an odd way of quickly becoming twisted into women-belong-back-in-the-kitchen arguments. And popular how-to books such as *Men Are from Mars, Women Are from Venus,* with their tenuous ties to evolutionary biology and their oversimplifications of the human mind, have not helped.

Pinker is quick to point out that "what is" must never be confused with "what should be." In fact, in *How the Mind Works* he bends over backward to make the distinction between science and morals. Nevertheless, "if you're a hostile reader," he notes, "I guess you read [into the book] what you want."

Pinker's battle with Gould might be characterized in the same way: each accuses the other of misrepresenting his views. In a nutshell, Gould asserts that Pinker and other "Darwin fundamentalists" have grossly overemphasized the role of natural selection at the expense of various other considerations—namely, everything from random genetic drifts to wayward meteors. Pinker acknowledges the importance of those factors but contends that a complex functional system such as the human mind must necessarily arise essentially from natural selection.

What irks many of Pinker's critics is the feeling that he and others have pushed their theories far beyond what the scientific data can support. According to biolinguist Lyle Jenkins of the Biolinguistics Institute in Cambridge, Mass., researchers have yet to understand all the individual development mechanisms (genetic, biochemical and so forth) that might have played a role in the biological evolution of the language faculty. "Unless you understand the whole problem, for example, the physical substrate that natural selection acts on, it's senseless to discuss whether language is an adaptation," he says. For these and other reasons, Chomsky, whose work laid the foundation for a biological basis to language, is himself reluctant to discuss whether language is an evolutionary adaptation. "I don't even understand what that means," he replies.

But others, including George C. Williams, one of the great evolutionary biologists of this century, assert that Pinker has indeed made the case for language being an adaptation. In fact, Williams says, "I recall getting annoyed at myself when reading *The Language Instinct* for not having thought of some of the things that Pinker came up with."

Weeks after meeting Pinker, as I sort through this debate, I become troubled by other issues. For one thing, why hasn't evolutionary psychology, an arguably powerful paradigm for explaining normal behavior, led to any treatments for mental illnesses such as schizophrenia and manic-depressive disorder? Pinker explains that if such illnesses prove to be physiological (perhaps caused by pathogens), they may be untreatable by psychological intervention, evolutionary or otherwise. For milder disorders, such as depression and phobias, Pinker says that clinical psychologists and psychotherapists are beginning to investigate evolution-based approaches.

Indeed, Pinker concedes that evolutionary psychology's work is hardly done, even for exploring everyday phenomena. Why, for example, do people derive such pleasure in listening to music? "A lot of times there'll be these embarrassing facts that you tuck away, thinking there's got to be an answer to them if only you had the time to look into it," he says. "But what you don't realize is that sometimes those facts are the ones that hold the key to a mystery, and so you've got to take those facts seriously because they change everything."

How such inconvenient facts and unsolved mysteries might muck up Pinker's neat landscape of the mind is unknown. For now, though, evolutionary psychology provides a plausible, if incomplete, approach for understanding the mind, and Pinker has certainly been instrumental in publicizing this paradigm. In the introduction to *How the Mind Works,* he writes, "Every idea in the book may turn out to be wrong, but that would be progress, because our old ideas were too vapid to be wrong."—*Alden M. Hayashi*