

Preface

In April 1975, Martin Gardner reported, in his *Scientific American* magazine column "Mathematical Games," that a new computer chess program invented at MIT "had established, with a high degree of probability, that pawn to king's rook 4 is a win for White." Tragedy! If this were so, the noble game of chess would be killed for all time, no more challenging than tic-tac-toe. Even if the algorithm purportedly discovered by the program was tediously complicated, something no human chess-player could hope to memorize, the mere knowledge that there was a mindless recipe for winning any game of chess would drain all the glory, all the art, out of the contest. Who would want to devote years to honing skills, enduring grueling tournaments, hunting for exquisite new strategies, all the while knowing that there was an easier way to win, a cheap trick that could not be thwarted? Nobody knows how many readers were taken in, but surely Gardner's unwelcome news struck at least momentary dread in the hearts of some chess-lovers, before they tumbled to the date and chuckled with relief. April Fools'!

Late one night a few years later, the sex researchers William Masters and Virginia Johnson, authors of *Human Sexual Response* (1966), were analyzing their voluminous data on orgasm and noticed a subtle but striking pattern: they had discovered, to their amazement, that the uttering of a simple verbal formula, a string of words (in any language) that exhibited an arcane pattern based on the Fibonacci series, would bring any normal postpubescent human to orgasm within a minute. They rechecked their data, ran just a few confirmatory experiments, and then . . . destroyed their notes, salted their data with misleading falsehoods to conceal the pattern from future eyes, and took a solemn vow not to reveal the secret they had uncovered. Thanks to their heroic sacrifice, sex as we know it lives on.

In early 2010, Hurley, Dennett, and Adams put the finishing touches on their evolutionary/neurocomputational model of humor and wondered if, just possibly, they had cracked the mystery that had baffled intrepid analysts and researchers for several millennia: it seemed they might have not only uncovered the neural mechanisms of humor but in the process devised a foolproof recipe for generating humorous *stimuli* of all varieties, from slapstick to witty retorts, from dirty jokes to high comedy. Set the dial and turn the crank and out comes Oscar Wilde, Charlie Chaplin, W. C. Fields, P. G. Wodehouse; nudge the dial and turn the crank again and out comes Steve Martin, Jim Carrey, Dave Barry, Gary Larson . . . Reductionistic science has triumphed again, and humor, as we know it, will soon be dead.

OK, we lied about Masters and Johnson. And we lied about the humor recipe. Not only does the theory in this book not uncover such a recipe, it shows why it is extremely unlikely that anybody—or any bank of computers—will ever find one. Art really is different from science, and comedy is art, like music and, well, art. Art does involve a kind of technology (*techne* in Greek, *technique* that one can master), but all the technique in the world only takes the would-be artist partway; our model helps explain why this is so, why the neural mechanisms engaged by humor—and they are, at bottom, “just” fantastically complex mechanisms, no *wonder tissue* involved at all—are quite systematically tamperproof. Nobody can *prove* that there will never be an algorithm for perfect chess; it is known that chess, which is a finite game, is officially vulnerable to brute-force, exhaustive, algorithmic solution, but it is also clear that no physically possible computer could complete that algorithmic search. That does not rule out the (tragic) possibility that there is a discoverable shortcut. Similarly, nobody can *prove* that there is no shortcut to humor, but the vast space of possible humor is much, much larger and more complicated than the space of chess, and changing all the time, so nobody should be too worried. Still, we appreciate that many people will confront our book with mixed emotions: curiosity—why on earth is there humor at all? how *could* it work?—competing with the hope that mystery will triumph, that nimble art will scamper out of the path of the lumbering juggernaut of science yet again. We share those mixed emotions and are happy to report that, if we are right, both will be gratified. We will explain why humor exists, how it works in the brain, and why comedy is an art. Let’s begin with the first of these questions.

There was an old woman who lived in a shoe.
She had so many children she didn't know what to do . . .
(Their rooms were piled high with the playthings of boys:
comic books, fishing rods, discarded toys,
model planes, model trains and the dirt that goes with them
and huge piles of laundry that flowed out to the kitchen.
And try as she may to get them to sweep—
she'd scold them, and threaten, implore them, and weep;
she'd given them dust-cloths, and vacuums and brooms—
she just could not get them to clean up their rooms.)
So she gave them some broth, without any bread,
and whipped them all soundly, and put them to bed.
. . . and, then, one night the old woman got a new idea:

She made them pajamas and bed socks of Swiffer cloth, and the next night while they slept she hid lots of candies around in their rooms, under the beds, under the piles of toys and clothes. In the morning when the children discovered the first of these candies, they went on a gleeful rampage, piling and sorting their belongings in the hunt for all the candies. By noon they were stuffed with candy—and their rooms were as orderly and clean as Martha Stewart's front parlor.

That may be an unlikely story, but we propose that Mother Nature—natural selection—has hit upon much the same trick to get our brains to do all the tedious debugging that they must do if they are to live dangerously with the unruly piles of discoveries and mistakes that we generate in our incessant heuristic search. She cannot just order the brain to do the necessary garbage collection and debugging (the way a computer programmer can simply install subroutines that slavishly take care of this). She has to bribe the brain with pleasure. That is why we experience mirthful delight when we catch ourselves wrong-footed by a concealed inference error. Finding and fixing these time-pressured misleaps would be constantly annoying hard work, if evolution hadn't arranged for it to be fun. This wired-in source of pleasure has then been tickled relentlessly by the *supernormal stimuli* invented and refined by our comedians and jokesters over the centuries. We have, in fact, become addicted to this endogenous mind candy in much the way long-distance runners become addicted to the endorphins their strenuous efforts pump into their blood streams. Humor, we will try to show, evolved out of a computational problem that arose when our ancestors were furnished with open-ended thinking.

This book grew out of Matthew Hurley's dissertation at Tufts University, completed in 2006, supervised by his two coauthors, Daniel Dennett and Reginald Adams, Jr. Since then it has undergone substantial revisions and enlargements, but the central novelties are Hurley's and the essential details of the theory remain unchanged since its earlier dissertational form. Humor has been a major research interest of Adams for years, and he led the way into the vast literature on humor for his coauthors, correcting myopic interpretations and misapprehensions, and holding their feet to the fire when their ideas were less clear and precise than they should be. For Dennett, this project discharges a promise unkept for almost twenty years. Here, at long last, is "a proper account of laughter" (and amusement) that "moves beyond pure phenomenology" (*Consciousness Explained*, 1991, pp. 64–66) that he can endorse wholeheartedly.

This is a book about humor, but it's not *just* about humor. It is a book about the epistemic predicament of agents in the world and a class of models of cognition that can successfully deal with that predicament. It argues that emotions govern *all* our cognitive activities, large and small, and that humor is thus a rich source of insights into the delicate machinery of our minds. Armed with the right theory, we can use humor as a sort of mind-reading device, exposing both the covert knowledge and the inner workings of the amused mind. Our theory draws extensively on earlier work in the field, but it adds a perspective, both evolutionary and computational, that has been largely missing. Humor cannot be just a happy accident of our biology, and the problem it is designed—by evolution—to solve must be a problem that is unique to our species (though we may see primitive or proto-versions of humor in other species). The theory we present attempts to answer questions that earlier work didn't even ask, and it is probably not quite right but it gives us all something to fix that is, we think, a significant advance over the earlier efforts.

We are indebted to a number of people for their contributions throughout the development of the ideas presented in this book. First, we would like to thank the late Alexander (Sasha) Chislenko whose own theory of humor—a kind of surprise theory (personal communication, 1998)—first inspired Matthew to look for an evolutionary answer to the riddle. Our theory differs from his, but if it wasn't for Sasha's insights this project might never have been undertaken.

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