

If humans are indeed motivated by self-interest, as Adam Smith concluded, then what are we to make of the prevalence of compassion, modesty, and awe in social groups as disparate as the isolated inhabitants of New Guinea and the crowded creatures of the city? Berkeley social psychologist Dacher Keltner argues that the secret to happiness lies in a *jen* ratio (the balance of good and evil in your life), and demonstrates that the simplest of touches and the slightest of smiles are encoded signals of our innate capacity to engage with others in cooperative communities. By turns personal, informative, amusing, and instructive, *Born to Be Good* continues Darwin's little-known work on human emotions and shows that survival is actually a matter of who is the kindest.

"A landmark book in the science of emotions and its implications for ethics and human universals." —E. JAMES LIEBERMAN, George Washington University School of Medicine, *Library Journal*



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Cover design by Kelly Blair
Author photograph by Paul Haller



\$16.95 USA \$21.00 CAN.

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W. W. NORTON
NEW YORK • LONDON

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"A bright, entertaining book." —Janet Maslin, *New York Times*

visible and unambiguous, and one that could preempt conflict and spread cooperative relations potently and quickly, faster than a stranger could cock his arm and throw the first punch. Evolution's answer to the question of how to most powerfully communicate our capacity for *jen* was like that of the classical Greeks: the smile.

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Laughter

IN THE 1982 FILM *Quest for Fire*, three hapless Neanderthal males leave their marsh-dwelling tribe in search of fire—the source of their haphazard provision of food and the hierarchical organization of their group. During their quest the three travelers escape from saber-toothed tigers, encounter towering woolly mammoths, and scare off a potential attack from a small tribe of paunchy, red-haired Neanderthals. In this last escapade, they rescue a different kind of early human. She is a more evolved female *Homo habilis*, finer in bone structure and facial morphology, lacking the carpet of hair covering the body, and adorned in patterned, tribal paints.

This female leads the three males on a primordial *Jules and Jim* road trip to her village. In this adventure, several distinctions between the Neanderthals and the *Homo habilis* come into sharp focus. The *Homo habilis* have developed special tools: a small board with a hole in it and a rounded stick to twist to create fire whenever needed—a radical innovation appreciated even by the dim-witted Neanderthals. They have more complex vocalizations than the grunts, groans, and growls of the Neanderthals. They beautify themselves with rudimentary paints. They live in sophisticated huts, organized in patterns comparable to that of the friendliest cul-de-sacs. They cultivate plants and animals—so critical, Jared Diamond

argues, to shifts in the evolution of human culture. They prefer face-to-face sex. And they laugh.

In one scene, the three Neanderthals and their new consort are reclining in the dappled light of a shady tree, grooming, scanning the environment, picking bugs out of the air to eat. Out of the blue a rock bounces off one of the male's jutting foreheads, prompting a scratch on the head, a cursory look around, and then a return to a quiet state of mindless digestion. The *Homo habilis* witnesses this simplest form of humor (I spent a good part of my youth bouncing harmless objects—acorns, olives, Good & Plenties—off my brother's head), and breaks into laughter. The three Neanderthals have no idea what to make of the weird sounds emanating from her mouth.

The thesis that laughter represents a critical evolutionary shift in hominid evolution is not as far-fetched as one might imagine. It is a point that evolutionists Matthew Gervais and David Sloan Wilson have made. The laugh might rightfully lay claim to the status of tool-making, agriculture, the opposable thumb, self-representation, imitation, the domestication of animals, upright gait, and symbolic language—an evolutionary signature of a great shift in our social organization, accompanied by shifts in our nervous system. What separates mammals from reptiles are the raw materials of laughter—play, and the ability to communicate with the voice (when's the last time you heard the family gecko howl for a nibble of your salmon or purr for a scratch behind the ears?).

More striking is how human laughter differs from that of our primate relatives—gorillas, chimps, and bonobos. In the most rudimentary sense, the laughter of the great apes resembles our own. Their relaxed open-mouth displays and panting vocalizations look and sound quite familiar. They emit these displays in similar contexts as we do—when being tickled and during rough-and-tumble play. As with humans, chimps and apes are most likely to show open-mouthed play faces in developmental periods (adolescence) and times of day (leading up to feeding) where play can defuse conflict. Yet the laughter of chimps and apes is more tightly linked to inhalation and exhalation patterns than that of humans. As a result, it is emitted as short, repetitive, single-breath pants, and has little acoustic variety.

Human laughter, by contrast, is stunning in its diversity and complexity. It is a language unto its own. There are derisive laughs, flirtatious laughs, singsongy laughs, embarrassed groans, piercing laughs, laughs of tension, silent, head-lightening laughs of euphoria, barrel-chested laughs of strength, laughs that signal the absurdity of the shortness of life and the extent to which we care about our existence, contemptuous laughs that signal privilege and class, and laughs that are little more than grunts or growls. It is because of this heterogeneity that laughter has escaped simple theoretical formulation. It is the analysis of this heterogeneity that will lead to an answer about why we laugh.

LAUGHTER FACTS

In T. C. Boyle's *Drop City*, a community of hippies, devoted to free love, spontaneous ritual, and immersion in nature, moves from their compound, Drop City in Sonoma County, California, to the last outpost of unspoiled nature—arctic Alaska. This journey, an expression of the American spirit, provides ample opportunity for laughter amid the inevitable conflicts of free love and broken-down cars and all too earthly negotiations of who does the dishes in a commune devoted to passion and ecstasy. Boyle's descriptions of laughter reveal several insights about laughter:

He heard Star laugh though, a hard harsh dart of a laugh that stuck right in him as he went off into the night, looking for something else altogether.

Her first response was a laugh, musical and ringing, a laugh that made the place swell till it was like a concert hall.

And then he began to chuckle, a low soft breathless push of air that might have been the first two bars of a song.

There was a smattering of nervous laughter when he descended the steps and the laughter boiled up into a wild

irrepressible storm of hoots and catcalls and whinnying shrieks as the door pulled shut and Norm put the bus in gear and headed off toward the lights of Canada.

Star let out a laugh in response to something Jimmy had said, and then they were all laughing—even him, even Marco, though he had no idea what he was laughing about or for or whether laughing was the appropriate response to the situation.

A new round of laughter. Dale Murray joined in too, whinnying along with the rest of them.

Suddenly he let out a laugh—a high sharp bark of a laugh that startled the dog out of his digestive trance—and he raised his head and gave Marco a sidelong look.

“Big spender,” she said, and her laugh trailed out over the river, hit the bank and came rebounding back again.

He then heard a squeal from Merry, or maybe it was Lydia, and a long sustained jag of laughter from all three of them, as if the very fact of his existence was the funniest thing in the world.

There were a few sniggers, a nervous laugh or two.

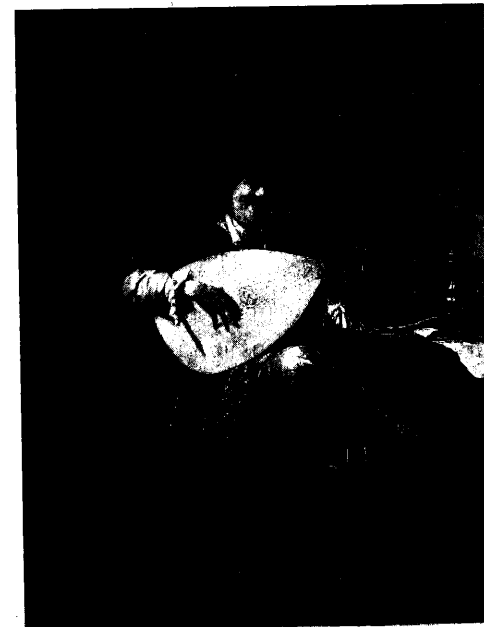
But they ate caribou tongue and Eskimo ice cream (caribou fat whipped into a confection with half a ton of sugar and a scattering of sour berries; Pan tasted it—“Ice cream, brother, it’s ice cream,” Joe Bosky told him, egging him on, but he spat it right back out into the palm of his hand, and the whole room went down in flames, laughing their asses off, funniest thing in the world, white man).

Pamela took one look at her and burst out laughing—she had to set down her cup because she was laughing so hard, her eyes squeezed down to semi-circular slits, her hands gone to her temples as if to keep her head anchored on her shoulders.

A first and perhaps most basic laughter fact is that nearly all laughter—darts, barks, sniggers, whinnies, hoots, jags, shrieks, catcalls—is social. Estimates indicate that laughter is thirty times more likely to occur around others than in isolation. We must move outside the individual’s mind to understand ways in which laughter binds people together.

Laughter is contagious. Laughter spreads to others, it washes over them, it sticks in people like darts, it fills rooms with a certain quality, it prompts others to begin laughing for no reason intelligible to the conscious mind. In *Drop City*, laughter routinely boils up into rounds, cascades, and storms. Rooms swell with laughter like music halls.

Laughter produces a remarkable physical state. People laugh their heads and asses off. During laughter, the body goes limp. The



Jan Steen’s portrayal of himself as a lute player wonderfully captures the relaxed state of physical collapse associated with laughter. It is fitting that Steen is such a talented painter of laughter, for he suffered many tragedies, including the early death of his first wife.

individual is incapable of any sort of motion. I've asked my daughters in the midst of a bout of being tickled to try to willfully carry out certain basic movements—whistle, wink, stick their tongue out at me—and they didn't come close. In the paroxysm of laughter, the body falls into a quiescent, otherworldly state.

And perhaps most subtly, laughter is intertwined with our breathing. In Boyle's descriptions, laughter accompanies pushes of air out of the mouth. With the exception of certain pathological laughs (Merv Griffin, Arnold Horshack on the 1970s sitcom *Welcome Back, Kotter*), almost all laughter occurs as people exhale. This simple laughter fact may seem incidental to our understanding of laughter, but in fact it is fundamental. Here's why.

Respiration and heart rate are two of the body's most essential rhythms. These two rhythms play off each other like the voices of singers in an a cappella group. When you breathe in, your heart rate rises. When you breathe out, your heart rate drops, as does your blood pressure, and you move toward a state of relaxation.

This lung-heart dynamic has made its way into book titles (*Waiting to Exhale*), aphorisms ("Take a deep breath"), ethical mottoes in grammar-school classrooms ("Take a breath and count to ten"), the advice coaches give to their players attempting the game-winning free throw (they systematically exhale), and the thousand-year-old breathing exercises of yoga practices. Exhalation reduces fight/flight physiology, especially heart rate, calming the body down. In fact, a series of studies in the 1970s and 1980s found that simply having individuals engage in deep breathing led to reduced blood pressure, stress, and anxiety, and increased calm.

When Robert Provine examined spectrograms of different laughs—that is, their acoustic signatures—he took out the staccato bursts that we hear as "ha, ha, ha" or "tee, hee, hee." These on average last about .75 seconds. In any typical laughter "bout," there are three to four of these "calls." What Provine found underlying those bursts was a deep sigh. Laughter is the primordial breathing technique, the first "take a deep breath" exhalation. When chimps and bonobos show the open-mouth play face, they are altering their fight/flight physiology to reduce the chances of aggression and opening up opportunities for play and affiliation.

GRUNTS, SNORTS, AND A SPACE OF ITS OWN

We have encountered some basic laughter facts—it is almost always social, it collapses the body into a state of relaxation, it is intertwined with breathing. We still, however, have not answered the simplest of questions: What is the meaning of a laugh? What unites the remarkable varieties of human laughter? Clues to understanding a category of expressive behavior—be it a sigh, a tongue protrusion, the eyebrow flash, or the blush—emerge when scientists seek principles that unite the varieties of behaviors within that category. We can thank Jo-Anne Bachorowski for this kind of painstaking work on the complex acoustics of human laughter.

As air moves through the human vocal apparatus (see figure below), upon being pushed out by muscle contractions surrounding the lungs it is given a vibratory pattern through movements of the vocal folds. The speed with which the vocal folds vibrate gives the sound its pitch. These sounds are then given additional acoustic

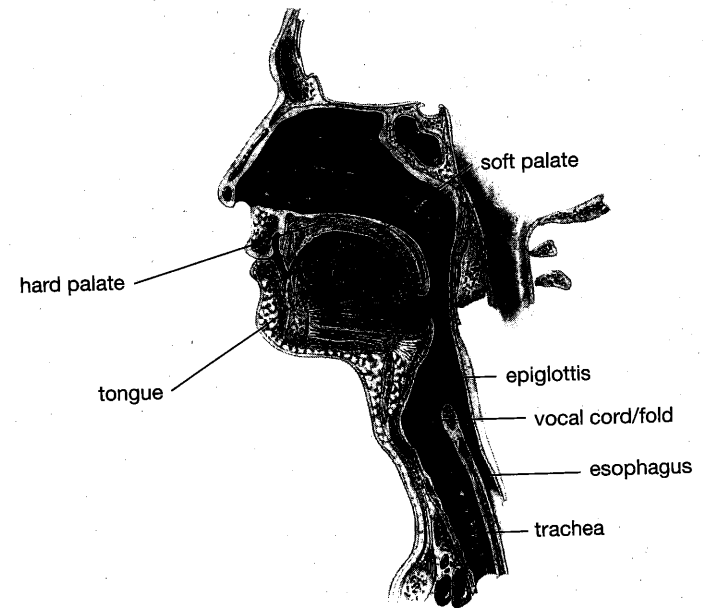


Diagram of the human vocal apparatus.

qualities, known as resonances and articulations, as they pass through the throat, delicate gymnastics of the human tongue, the opening of the mouth (for example, is it wide open, or are the teeth clenched?) and degree of opening in the nasal passage. Researchers then take these complex sounds, as represented in spectrograms, and extract a variety of different measures to arrive at an acoustic profile of a laugh, a sigh, a moan, a groan, or a tease. Measures include speech rate, pitch, loudness, pitch variability, and whether the sound rises or falls at the end.

Bachorowski was the first to put laughs through this complex form of acoustic analysis. She did so by recording the laughs of friends and strangers while watching Robin Williams, while playing amusing games together, or while simply talking casually. She has ruined her eyes in close-up analysis of thousands of laughs, and arrived at the beginnings of a laughter dictionary. There are cackles, hisses, breathy pants, snorts, grunts, and songlike laughs with mellifluous acoustic structure. Provine has found that women tend to laugh more than men, and Bachorowski's work ups the gender ante: Men, pitiful apes that they are, are much more likely to snort and grunt than women.

Bachorowski then conducted microscopic analyses of the fundamental acoustics of laughs. This laborious work yielded three clues to the deep meaning of laughter, and why it emerged in human evolution. The first clue helps us to begin to make sense of the astounding varieties of laughter. Bachorowski has differentiated between what she calls voiced laughs, which have tone to them and involve vibrations of the vocal folds (chords), and unvoiced laughs, which do not. Voiced laughs sound like songs, rising and falling as they move through space. Other people perceive these laughs as invitations to friendship and camaraderie. Unvoiced laughs—hisses, snorts, grunts—are not perceived as such. Much as the language of smiles is divided into Duchenne and non-Duchenne smiles, there are voiced laughs of pleasure and unvoiced laughs not involving pleasure. In his remarkable meditation on laughter, *The Book of Laughter and Forgetting*, Milan Kundera writes about two kinds of laughs. The laugh of the devil denies the rational order of the world. The laugh of the angel affirms the beauty of things and

things lovers, friends, and comrades together in common purpose in an elevated state above the earthly ground. Voiced laughs are Kundera's laughs of angels and unvoiced laughs those of the devil. Both are vital to the social contract.

Bachorowski made a second crucial discovery in analyses of how the laughs of individuals play off one another like the sounds of different instruments in an orchestra. The laughs of friends, as opposed to those of strangers, start out as separate vocalizations but quickly shift to become overlapping, intertwined sounds whose acoustic qualities mimic each other. Bachorowski deemed these laughter duets antiphonal laughter. This is the kind of laughter that unites people in affection. Friends, when responding to humor and levity, quickly find a common place in acoustic space for sharing laughter; their minds are united in two- to three-second periods of antiphonal laughter.

Finally, Bachorowski identified where laughs fall in acoustic space compared to consonants and vowels. Here a remarkable discovery: Laughs occupy a part of acoustic space that is different from vowel sounds like "ahhh" and "eee." We may describe laughs in the written word as "ha, ha, ha" or "hee, hee, hee," but in fact the acoustic structure of laughter is distinct from that of the vowels we use to represent this mysterious category of behavior. Certain regions of the human vocal apparatus produce the vowels and consonants that make up human speech, in which so much of human social life transpires. But there is another register of the human vocal apparatus, another form of output—laughter—with different origins and functions than human speech.

In light of Bachorowski's discoveries, it is now assumed that laughter preceded language in human evolution, emerging in early protohuman form some four million years ago. This is significantly earlier than when humans started to put together vowels and consonants into phonemes, and those phonemes into words and sentences. Recent neuroscientific data on laughter, summarized by Willibald Ruch, one of the leading laughter scientists, yields a similar conclusion about the early appearance of human laughter in evolution. Ruch has synthesized numerous brain studies of laughter. Some focused on the brain correlates of pathological laughter.

For example, people who suffer from a syndrome known as pseudobulbar affect will abruptly break into uncontrollable laughter in response to inappropriate stimuli—the tilt of a head, the movement of a hand, a trivial comment in a conversation. In other studies, laughter was observed following electrical stimulation to specific regions of the brain. When people laugh, subcortical, limbic regions of the brain and brain stem—most notably a region known as the pons, which is involved in sleep and breathing—are activated. These regions are much older evolutionarily than the cortical regions involved in language, suggesting that the deeper meaning of laughter is intertwined with breathing.

WHAT'S SO FUNNY ABOUT LAUGHTER

Laughter, then, is social and contagious. It empties the air deep in the cavities of our lungs, allowing heart rate and blood pressure to drop, the muscles of fight/flight exertion to go limp, and our psyche to fall into a calm state. These laughter facts fit nicely with the most enduring notion about the meaning of laughter, that it is the behavioral output of the experience of humor. Humor is as difficult to deconstruct as laughter, but there is consensus about the canonical structure of humorous acts: they involve some juxtaposition of contradictory propositions that produces a state of tension and ambiguity. The resolution of that contradiction then arrives in the form of a conceptual insight or punchline, the contradiction is resolved, and we laugh.

This hypothesis, that laughter serves to reduce tension, ran into some uncharitable data gathered by Robert Provine. Rather than restrict himself to the sterile confines of the laboratory, or rely on abstract, armchair conceptual analysis, Provine turned his astute ear to the laughter that occurs in the real world. He had three undergraduate assistants surreptitiously record bursts of laughter in malls, in friendly conversations on street corners, in the cafeteria banter of college students. This small band of laugh collectors recorded over 1,200 laughs in all. Provine transcribed these episodes into laughter narratives and then dissected what people were talking about just prior to laughter.

Humor often did precede laughter. Who wouldn't have laughed at least chuckled with head tilted back, closed eyes, and collapsed torso and shoulders after hearing the following statements?

She's working on a PhD in horizontal folk dancing.

You just farted!

Poor boy looks just like his father.

When they asked John, he said that he wanted to grow up to be a bird.

Do you date within your species?

Was that before or after I took off my clothes?

Is that considered clothing or shelter?

Humor-oriented utterances, however, represented only 10 to 20 percent of prelaugh statements. Importantly, Provine found that laughter followed all sorts of utterances. Over 80 percent of the laughs did not occur in response to humor. Consider some of the following utterances that produced laughter.

I see your point.

I hope we all do well.

We can handle this.

I told you so!

Are you sure?

Why are you telling me this?

What is that supposed to mean?!

Not exactly knee-slapping fare ready for *The Daily Show*, *Saturday Night Live*, Robin Williams, the class clown, or the town wit. If these elicitors of laughter were just exceptions to the rule, we could readily discount them. But conversational events unrelated to humor were the rule and not the exception, and beg for more precise theorizing about laughter.

THE COOPERATION SWITCH

What, then, is the conceptual unifier of the cackles, guffaws, hisses, chortles, snorts, and melodious songs that we hear every day, or at least on the days that are more pleasing to the soul? We have seen that the time-honored thesis—humor—does not suffice. It fails to explain many, even the vast majority, of laughs that occur in our daily living. For Bachorowski and her colleague Michael Owren, the answer is cooperation. In an insightful analysis, Bachorowski and Owren argue that laughter builds cooperative bonds vital to group living. It does so through two mechanisms.

The first is contagion: We routinely laugh, and experience exhilaration and levity, at the sound of another's laugh. The contagious power of laughter motivated the introduction of laugh tracks on TV, a history that Provine details in *Laughter*. Recent neuroscience evidence suggests that when we hear others laugh, mirror neurons represent that expressive behavior and quickly activate action tendencies and experiences that simulate the original laugh in the listener's brain. Specifically, laughter triggers activation in a region of the motor cortex in the listener, the supplementary motor area (SMA). Bundles of neurons leaving the SMA go to the insula and the amygdala, thus triggering the experience of mirth and amusement in the perceiver of the laugh. When we hear others laugh, this system of mirror neurons acts as if the listener is laughing.

Laughter builds cooperative bonds through a second mechanism, Bachorowski and Owren propose: Laughter rewards mutually beneficial exchanges—successful collaborations at work, in the kitchen, in child rearing, with friends. Laughter signals appreciation and shared understanding. Laughter evokes pleasure. Given

that each individual has a signature laugh, produced by the particulars of the vocal apparatus, laughs become unique rewards of cooperative exchange, building trust between individuals.

This theorizing yields deep insights into laughter. Laughter is not simply a read-out of an internal state in the body or mind, be it the cessation of anxiety and distress or uplifting rises in mirth, levity, or exhilaration. Instead, laughter is also a rich social signal that has evolved within play interactions—tickling, roughhousing, banter—to evoke cooperative responses in others. The laughter as cooperation thesis brings together scattered findings in the empirical literature. A deadlocked negotiation between Palestinian and Israeli negotiators took a dramatic turn toward common ground and compromise after they had laughed together. In my own research with executives, laughter early in negotiations—the product of breaking-the-ice banter about families, travel mishaps, hotel rooms, golf games, and the like—sets the stage for mutually beneficial bargaining. Workplace studies find that coworkers often laugh when negotiating potential conflicts—in tight spaces, at tense team meetings, when critiquing a colleague's work. Romantic partners who manage to laugh while discussing an issue of conflict find greater satisfaction in their intimate relations. Strangers who laugh while flirting in casual conversation report greater attraction. Friends whose laughs join in antiphonal form discover greater intimacy and closeness.

And what applies to the role of laughter in Middle East negotiations and the pyrotechnics of executives haggling, colleagues coexisting, and strangers flirting speaks to the long-term trajectories of attempts at connubial peace. John Gottman has found that for couples who were divorced on average 7.4 years after they were married, negative affect—for example, contempt and anger—was especially predictive of marital demise. For couples who divorced on average 13.9 years after they were married, it was the absence of laughter that predicted the end of their bond. In the early stages of a marriage, anger and contempt are highly toxic. In the later phases of intimate relations, it is the dearth of laughter that leads individuals to part ways. Without that cooperative frame for an intimate bond that laughter provides, as well as its attendant delights, partners move on.

Perhaps laughter is the great switch of cooperation. It is a fitting device, shifting social interactions to collaborative exchange based on trust, cooperation, and goodwill. Perhaps the pulse of marriage is to be heard in the laughter the partners share. When I awaken and I hear my two daughters giggling in the antiphonal laughter that Bachorowski discovered, I know the morning will be fine, and relatively free of the conflicts of siblings as they seek their distinct niches in life. Perhaps our relationships are only as good as our histories of laughter together.

This theorizing, though, is in need of a bit more precision. We cooperate in many ways—through gifts, soothing touch, compliments, promises, and acts of generosity. Laughter must be associated with a more specific brand of cooperation.

Counterexamples to the laughter as cooperation hypothesis readily leap to mind. Bullies routinely laugh at their aggressive acts of humiliation (just listen to the shrill nerve jangling “ha, haa” of Nelson, the bully on *The Simpsons*). Some torturers at Abu Ghraib were heard to laugh at their victims. Thomas Hobbes wrote that laughter is the “sudden glory” produced by “the apprehension of some deformed thing in another” that makes people “suddenly applaud themselves”—a view that does not surprise given his portrayal of a dog-eat-dog world. Clues to a more precise conceptualization of laughter are found in its origins—in how play and laughter emerge in children, and what is being achieved, socially and conceptually, in the process.

THE ABUSE OF LANGUAGE

The acquisition of language in young children is breathtaking. Children learn ten or so words a day until the age of six, when the average child has a command of over 13,000 words. Children produce grammatically complex phrases even when not given such input from their parents, for example when parents speak pidgin. It is for these reasons that Steve Pinker called this high-wattage capacity the language instinct.

Just as remarkable, though, is how quickly children begin to

violate the rules of language. In particular, there is striking developmental regularity in the tendency for children, early in life, to violate basic rules of representation. They quickly start producing utterances that violate notions that words are supposed to refer to specific objects, and objects are to be characterized by specific words. And it is in this representational abuse that we find the core meaning of laughter—laughter indicates that alternatives to reality are possible, it is an invitation to enter into the world of pretense, it is a suspension of the demands of literal meaning and more formal social exchange. Laughter is a ticket to travel to the landscape of the human imagination.

In his analysis of the development of pretense, Alan Leslie details three kinds of pretend play in children. Each kind of pretend play hinges on the child violating the rules regarding correspondences between words and the objects to which they refer. In object substitution, the child substitutes nonliteral meanings of objects for the real meaning of the object. In the young child's world of pretend play, rocks become bread, swim goggles become cell phones, pillows become walls to fortresses, bedrooms become classrooms, older sisters petty rock stars or demanding old dames in the grocery store they run in the living room.

Children attribute nonliteral properties to objects in a second form of pretend play. While my daughters were five and three, respectively, I spent the better part of a year being a prince dancing with them at various balls. They insisted that I wear a certain pair of sweats, which they ascribed with the velvety beauty of a prince's medieval tights. This form of play, founded on the attribution of pretend properties, shifted a bit later to a set of identities I felt much more at home in—the ogre or friendly gorilla—all pretend identities that derived from elaborations upon my physical status and regrettable postpartum paunch.

And finally, the young child's world becomes filled with imaginary objects. In this third kind of pretend play, children simply imagine things that are not there—chalices in the princess's cupped hand, swords, magic carpets, evil witches and comrades in common cause.

These forms of pretense emerge in systematic fashion at around

eighteen months of age. They are all systematically accomplished by laughter. And they lead the child to develop the ability to use language to refer to multiple objects. As children free themselves from one-to-one relations between words and objects, they learn that words can have multiple meanings. They also learn that objects can be used for multiple things—a banana can be a banana, a phone, an ogre's nose, or a boy's penis (when the parents aren't around).

In the freedom of pretend play, children learn that there are multiple perspectives upon objects, actions, and identities. The child moves out of the egocentrism of his or her own mind and learns to understand the beliefs and representations of other minds most certainly different from one's own. And it is laughter that transports children to a new platform of understanding and epistemological insight.

Developmental psychologists who have studied the pretend play of siblings in the home, or the playful wrestling of parents and children, or the playful exchanges of children on the playground, find that laughter reliably initiates and frames play routines. A child or parent will laugh as a chase game, roughhousing, round of silly talk, or wordplay or storytelling gets under way. Linguist Paul Drew carefully analyzed the unfolding of family teasing interactions and found that they are framed by laughs. Laughter is a portal to the world of pretend, play, and the imagination; it is an invitation to a nonliteral world where the truths of identities, objects, and relations are momentarily suspended, and alternatives are willingly entertained. Those hours of pretend play—peek-a-boo games, monsters and princesses, the ogre under the bridge, astronauts—are the gateway to empathy and the moral imagination.

LA PETITE VACATION

In the observation that laughter accompanies the child's capacity to pretend, to participate in alternatives to the realities referred to in sincere communication, we arrive at a hypothesis about laughter. Let's call this hypothesis the laughter as vacation hypothesis. The name of this hypothesis honors the comedian Milton Berle, witness, it is safe to claim, to millions of laughs during his career. Summing

the mysteries of laughter, Berle proposed, "Laughter is an orgasm." If orgasm for the French is *la petite mort* (the little death), then laughter is *la petite vacation*.

The wisdom of Berle's hypothesis is found in the etymology of the word "vacation" which yields a nuanced story. The word "vacation" traces its etymological history back to the Latin *vacare*, which means to be free, or at leisure" and is defined as a formal suspension of duty. The laugh, then, signals the suspension of formal duty for a moment. It points to a layer of interaction where alternative meanings are possible, where identities are lightened and nonserious. When people laugh, they are taking a momentary vacation from the more sincere claims and implications of their actions.

Let's weave our facts and speculations together into the petite vacation hypothesis. In our primate evolution, laughter begins in the open-mouth play faces of chimps and bonobos, which signal and initiate playful routines. The quality of laughter, its sound and its feeling, is rooted in physical action, as Darwin long ago observed: It is intertwined with exhalation, and the reduction of stress-related physiology. A special realm of sound is reserved for laughs, and it is an ancient one that predates language, represented in old regions of the nervous system—the brain stem—which also regulates breathing. This acoustic space reserved for laughs triggers laughter and pleasure in others, and designates, like the confines of a circus or theater, a social realm for acts of pretense and the imagination. In the pretend play of young children, laughter enables playful routines that allow them to have alternative perspectives on the world they are facing. Laughter is a ticket to the world of pretense, it is a two- to three-second vacation from the encumbrances, burdens, and gravity of the world of literal truths and sincere commitments.

LAUGHING AT DEATH

My dear friend and colleague George Bonanno took a while to get to academics. After riding trains, picking apples in Washington

State, living in communes, and painting signs in Arizona. He decided, on a whim, to take a community college creative writing course. After his first submission, he was discovered by his instructor, and quickly found himself on a fast track toward a PhD. Proponents of the conventional view of trauma may have argued that he never took that writing course.

For the past fifteen years, using intensive narrative interviews and longitudinal designs, he has studied how individuals adapt to various kinds of trauma—the death of a marital partner, the death of a child, sexual abuse, the death of a child. He kept encountering a basic finding not anticipated in the literature on trauma. The conventional view is that after a trauma everyone suffers prolonged periods of maladjustment, anxiety, distress, and depression. George has found in every study he has conducted that a significant proportion of people suffering a trauma experience distress and upset but in the broader scheme of things, fare quite well. Within a year, they are as happy as they were, more poignant perhaps, filled with bursts of breathless longing, but in the end, content with life, and perhaps a bit wiser.

His question: What allows people to adjust to life-altering traumas? Our answer: Laughter. Laughter provides a brief vacation from the existential impossibilities, the deep sadness, the disorienting anxieties, of losing a loved one, or losing a city or way of life.

To test this thesis, George and I undertook a study to look at the role of laughter during bereavement. To do so, we brought forty-five adults to our laboratory, individuals who six months prior had watched their spouses die. Six months into bereavement is a poignant time. The death of a spouse leaves individuals mildly depressed, disoriented, lonely, and disorganized. The daily rhythms of a marriage are gone. So too are the conversations about what happened during the day, the fragments of a dream, the funny thing a friend or loved one did or said, how work went. Bereaved adults often have trouble conducting the daily affairs of their lives—remembering to pay bills, plan dinners, go shopping, fix cars—because the other part of their collective mind is gone. Reminders of their partner—photos, clothing, scents and sounds from the past—weigh them down in yearning. So we asked: Would laughter

bereaved adults to find new layers of meaning in the midst of their loss, and perhaps a path to the meaningful life?

Forty-five participants came to George's lab in San Francisco, really an upstairs room in an old Victorian, with wood floors and a paneled glass. After some preliminary talk, George asked the participants the simplest of things, to "tell me about your relationship with your deceased partner." They were then given six minutes to tell their narratives of their relationships with the deceased partner. There were stories of meeting one another at a blues show, of a young man in his early youth, raising children, and then bleeding gums that preceded a rapid death six months later, with children at the mother's side at the hospital bed. One man, in response to George's question, could only sob and gasp for six minutes, uttering not a word. He could not remember another woman whose husband had committed suicide at the end of a manic episode that was capped off by a disturbing fall from a high-rise building. She could not remember a visit to his mother. At the end of her narrative of this freefall, she could hear doves cooing on the windowsill of the lab room. As George planned the next stages of this longitudinal study (he had already assessed the well-being of these individuals for several years), he sent me the videotapes of these conversations. For an entire summer, locked up in my laboratory video coding room in the basement of my department, I coded these six-minute conversations with Ekman and Friesen's Facial Action Coding System. Each conversation took about six hours to code. Spending eight hours each day listening to stories of dying and coding such deep emotion left me exhausted and humbled. Almost all of our participants showed numerous displays of negative emotion, such as anger, sadness, fear, and, less frequently, disgust.

Our question was a simple one that had never been addressed before: What emotions predict healthy adjustment to the death of a spouse, as assessed with clinically sound measures of anxiety and depression, as well as measures of prolonged bereavement, which captures the individual's continuing longing for the deceased and inability to reenter into daily living? And which emotions predict poor adjustment during bereavement?

Traditional bereavement theories offer two clear predictions. This thinking is based on Freudian notions of "working through"

the emotional pain of loss and the cathartic release of anger. It predicts that recovery from bereavement depends on the incorporation of negative emotions, such as anger and sadness. A second prediction is that the expression of positive emotion is in itself a pathological sign of denial, of an intentional turning away from the existential facts of trauma, and impedes grief resolution. Our thinking was just the opposite, that laughter would allow bereaved participants to distance themselves momentarily from the pain of the loss, to gain perspective, to look upon their lives in a more detached way, to find a moment of peace, to take a deep breath, so to speak.

Our first finding lent support to this view of laughter. Measurement of laughter (and smiling) predicted *reduced* grief as assessed at six, fourteen, and twenty-five months postloss. Those participants who showed pleasurable, Duchenne laughter while talking about their deceased spouses were less anxious and depressed, and more engaged in their daily living, for the next two years. Just as important, people who showed more anger were observed to be experiencing more anxiety, depression, and disengagement from daily living for the next two years.

A first objection one might raise with respect to these findings concerns the nature of the death. Perhaps those individuals who laughed had partners who experienced easier deaths and thereby felt less initial grief and, as a result, were better able to adjust to this difficult loss. We know from empirical studies of bereavement that the nature of the death matters—sudden deaths, and deaths that produce greater financial demands upon the spouse, lead to prolonged grief and difficulty readjusting. We also know that the severity of the individual's initial grief powerfully predicts the degree of difficulty in adjusting that that person will experience later. These possibilities did not explain away the benefits of laughter: Those individuals who showed pleasurable laughter compared to those who did not did not differ in the nature of their spouse's death (its unexpectedness or financial impact) nor in their initial levels of grief.

One might likewise argue that perhaps our individuals who laughed at death were just happier individuals to begin with. Perhaps our results linking laughter to adjustment were simply the

of the temperamental happiness of the individual and not of the emotional dynamics and perspective shifts accompanying it. This alternative too proved untenable—our people who laughed did not differ on any conventional measure of dispositional happiness from our individuals who did not laugh. Inspired by these findings, George and I went on a search for further evidence in support of the benefits of laughter. Why did laughter while talking about the deceased partner relate to increased emotional adjustment? What we observed were findings very much consistent with the laughter as vacation hypothesis. Our first analysis looked at how bereaved individuals' experience of distress was related to one physiological index of arousal—elevated heart rate. Bereaved individuals who laughed showed similar heart rate increases as those who did not laugh. But whereas our nonlaughers' feelings of distress closely tracked increases in their heart rate, our laughers' feelings of distress were decoupled from this physiological index of stress. Metaphorically, laughers were taking a vacation from the stress of their partners' deaths, freed from the tension of distress-related physiology.

We then transcribed their conversations and identified exactly what the bereaved participants were talking about when they laughed. Here again, data suggest that laughter is not a sign of denial of trauma, as widely assumed, but an indicator of a shift toward a new perspective enabled by the imagination. We coded participants' references to several existential themes related to bereavement—loss, yearning, injustice, uncertainty. We also coded for insight words that reflect a shift in perspective, phrases like “I see” or “from this perspective” or “looking back.” Our participants who laughed were most likely to be talking about the injustice of death—the unfair termination of life, the difficulties of raising a family alone, the loss of intimacy—but they engaged in this discourse with perspective-shifting clauses. Laughter was part of these individuals' shift in viewing the death of their spouses. It was a portal into a new understanding of their lives. A laugh is a lightning bolt of wisdom, a moment in which the individual steps back and gains a broader perspective upon their lives and the human condition.

Finally, our data speak to the social benefits of laughter. Our

bereaved individuals who laughed reported better relations with current significant other. They more readily engaged in new intimate relations.

LAUGHTER=NIRVANA

The Buddha's path to enlightenment was arduous. He had to leave the comforts of his well-to-do family, his wife, and his new child. He wandered for years grasping for the state of nirvana in different spiritual practices. He nearly died in ascetic practice, starving himself to bone on skin. When the Buddha finally attained enlightenment under the bodhi tree, it was in the realization that the suffering of life is rooted in self-centeredness and desire and that, once shed of such illusions, goodness arises from within. Loving kindness, compassion, right talk and action, peace, and indescribable joys are realized. In this epiphany the Buddha must have deeply exhaled. My bet is that he laughed as well.

Nibbana—nirvana—originally meant “to blow out.” Clearly “blow out” refers to blowing out of the flames of self-interested desire, the obstacle to nirvana. I'd like to think a second possibility is that nirvana means to blow out, to exhale, to laugh.

Images of the Buddha are often images of full-bellied laughter. Study the images of the Dalai Lama with heads of state from around the world and they are all images of body-shifting laughter. The 100 Zen koans amassed in twelfth- and thirteenth-century Japan were used by Buddhist teachers to disengage the conscious rational mind, opening up opportunities for enlightenment. Well-known koans are intentionally paradoxical:

If you meet the Buddha, kill him.

Two hands clap and there is a sound. What is the sound of one hand?

Many other koans employ absurd humor; they have survived because of their capacity to reduce disciples to laughter:

What is the Buddha? Three pounds of flax.

What is the Buddha? Dried dung.

Laughter may just be the first step to nirvana. When people laugh, they are enjoying a vacation from the conflicts of social living. They are exhaling, blowing out, and their bodies are moving toward a peaceful state, incapable of fight or flight. People see their lives from a different point of view, with new perspective and detachment. Their laughter spreads to others in milliseconds, through the firing of networks of mirror neurons. In shared laughter people touch, they make eye contact, their breathing and muscle actions are in sync, they enjoy the realm of intimate play. Conflicts are softened, and often resolved. Hierarchies negotiated. Attraction and intimacy are created. What was once in the denominator of the *jen* ratio—conflicts, tensions, frustrations—fades away. People move closer to one another in peaceful ways.