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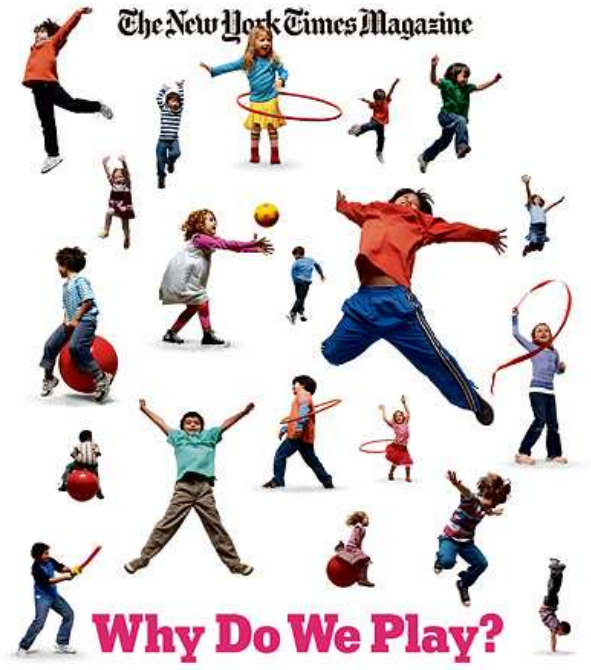

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Taking Play Seriously

By ROBIN MARANTZ HENIG

On a drizzly Tuesday night in late January, 200 people came out to hear a psychiatrist talk rhapsodically about play — not just the intense, joyous play of children, but play for all people, at all ages, at all times. (All species too; the lecture featured touching photos of a polar bear and a husky engaging playfully at a snowy outpost in northern Canada.) Stuart Brown, president of the National Institute for Play, was speaking at the New York Public Library's main branch on 42nd Street. He created the institute in 1996, after more than 20 years of psychiatric practice and research persuaded him of the dangerous long-term consequences of play deprivation. In a sold-out talk at the library, he and Krista Tippett, host of the public-radio program "Speaking of Faith," discussed the biological and spiritual underpinnings of play. Brown called play part of the "developmental sequencing of becoming a human primate. If you look at what produces learning and memory and well-being, play is as fundamental as any other aspect of life, including sleep and dreams."

The message seemed to resonate with audience members, who asked anxious questions about what seemed to be the loss of play in their children's lives. Their concern came, no doubt, from the recent deluge of eulogies to play . Educators fret that school officials are hacking away at recess to make room for an increasingly crammed curriculum. Psychologists complain that overscheduled kids have no time left for the real business of childhood: idle, creative, unstructured free play. Public health officials link insufficient playtime to a rise in childhood obesity. Parents bemoan the fact that kids don't play the way they themselves did — or think they did. And everyone seems to worry that without the chance to play stickball or hopscotch out on the street, to play with dolls on the kitchen floor or climb trees in the woods, today's children are missing out on something essential.

The success of "The Dangerous Book for Boys" — which has been on the best-seller list for the last nine months — and its step-by-step instructions for activities like folding paper airplanes is testament to the generalized longing for play's good old days. So were the questions after Stuart Brown's library talk; one woman asked how her children will learn

trust, empathy and social skills when their most frequent playing is done online. Brown told her that while video games do have some play value, a true sense of “interpersonal nuance” can be achieved only by a child who is engaging all five senses by playing in the three-dimensional world.

This is part of a larger conversation Americans are having about play. Parents bobble between a nostalgia-infused yearning for their children to play and fear that time spent playing is time lost to more practical pursuits. Alarming headlines about U.S. students falling behind other countries in science and math, combined with the ever-more-intense competition to get kids into college, make parents rush to sign up their children for piano lessons and test-prep courses instead of just leaving them to improvise on their own; playtime versus résumé building.

Discussions about play force us to reckon with our underlying ideas about childhood, sex differences, creativity and success. Do boys play differently than girls? Are children being damaged by staring at computer screens and video games? Are they missing something when fantasy play is populated with characters from Hollywood’s imagination and not their own? Most of these issues are too vast to be addressed by a single field of study (let alone a magazine article). But the growing science of play does have much to add to the conversation. Armed with research grounded in evolutionary biology and experimental neuroscience, some scientists have shown themselves eager — at times perhaps a little too eager — to promote a scientific argument for play. They have spent the past few decades learning how and why play evolved in animals, generating insights that can inform our understanding of its evolution in humans too. They are studying, from an evolutionary perspective, to what extent play is a luxury that can be dispensed with when there are too many other competing claims on the growing brain, and to what extent it is central to how that brain grows in the first place.

Scientists who study play, in animals and humans alike, are developing a consensus view that play is something more than a way for restless kids to work off steam; more than a way for chubby kids to burn off calories; more than a frivolous luxury. Play, in their view, is a central part of neurological growth and development — one important way that children build complex, skilled, responsive, socially adept and cognitively flexible brains.

Their work still leaves some questions unanswered, including questions about play’s darker, more ambiguous side: is there really an evolutionary or developmental need for dangerous games, say, or for the meanness and hurt feelings that seem to attend so much child’s play? Answering these and other questions could help us understand what might be lost if children play less.

“**See how that little** boy reaches for a pail?” Stuart Brown asked one morning last fall, standing with me on the fringes of a small playground just north of the Central Park Zoo. “See how he curves his whole body around it?” Brown had flown to New York from his home in California to pitch a book about play to publishers. (He sold the idea to an editor at Penguin.) He agreed to meet me at the zoo while he was in town, to help me observe playfulness in the young members of many animal species, including our own.

Social play has its own vocabulary. Dogs have a particular body posture called the “play bow” — forelegs extended, rump in the air — that they use as both invitation and punctuation. A dog will perform a play bow at the beginning of a bout, and he will crouch back into it if he accidentally nips too hard and wants to assure the other dog: “Don’t worry! Still playing!”

Other species have play signals, too. Chimps put on a “play face,” an open-mouthed expression that is almost like a face of aggression except that the muscles are relaxed into something like a smile. Baboons bend over and peer between their legs as an invitation to play, beavers roll around, goats gambol in a characteristic “play gait.” In fact, most species have from 10 to 100 distinct play signals that they use to solicit play or to reassure one another during play-fighting that it’s still all just in fun. In humans, the analogue to the chimp’s play face is a child’s smile, an open expression that indicates there is no real anger involved even in gestures that can look like a fight.

The day Brown met me in the park was a cold one, and the kids were bundled up like Michelin Men, adding more than the usual heft and waddle to their frolicking. Even beneath the padding, though, Brown could detect some typical gestures that these 2- and 3-year-olds were using instinctively to let one another know they were playing. “Play movement is curvilinear,” he said. “If that boy was reaching for something in a nonplay situation, his body would be all straight lines. But using the body language of play, he curves and embraces.”

In their play — climbing up a slide, running around, passing buckets back and forth — the kids we watched were engaging in a pattern of behavior that many scientists believe is hard-wired. Their mothers and nannies were watching, too, no doubt having dragged the kids out of comfortable Upper East Side apartments because they thought daily play was important somehow, perhaps the first step in the long march toward Yale. To me all that little-kid motion looked just a bit silly — because play is, in many ways, a silly thing. Indeed, an essential component of play is its frivolity; biologists generally use phrases like “apparently purposeless activity” in their definitions of play. The definition proposed by Gordon Burghardt, an evolutionary psychologist at the University of Tennessee, refines

that phrase a little. In his 2005 book, “The Genesis of Animal Play,” he wrote that play is an activity of “limited immediate function.”

Burghardt included several other factors in his definition too. Play is an activity that is different from the nonplay version of that activity (in terms of form, sequence or the stage of life in which it occurs), is something the animal engages in voluntarily and repeatedly and occurs in a setting in which the animal is “adequately fed, healthy and free from stress.” That last part of the definition — that play requires that an animal be stress-free and secure — suggests that play is the biological equivalent of a luxury item, the first thing to go when an animal or child is hungry or sick.

This makes evolutionary scientists prick up their ears. How can a behavior be crucial and expendable at the same time? And play is indeed expendable. Studies of vervet monkeys found that playtime decreased to almost zero during periods of drought in East Africa. Squirrel monkeys won’t play when their favorite food sources are unavailable. In humans under stress, what happens with play is more complicated. Even under devastating circumstances, the drive to play is unquenchable. As George Eisen wrote in “Children and Play in the Holocaust”: “Children’s yearning for play naturally burst forth even amidst the horror. . . . An instinctual, an almost atavistic impulse embedded in the human consciousness.”

Yet play does diminish when children suffer long-term, chronic deprivation, either one at a time in abusive or neglectful homes, or on a massive scale in times of famine, war or forced relocation. And children can still survive, albeit imperfectly, without it.

For humans and animals alike, truly vigorous, wholehearted, spontaneous play is something of a biological frill. This suggests one possible evolutionary function: that in its playfulness, an animal displays its own abundant health and suitability for breeding. But a skeptic might see it differently: if a behavior is this easy to dispense with when times are hard, it might suggest that the behavior is less essential than some advocates claim.

If play is an extravagance, why has it persisted? It must have some adaptive function, or at least a benefit that outweighs its cost, or it would have been winnowed out by the forces of natural selection. One answer can be found through ethology, the study of animal behavior, which takes as one of its goals the explication of how and why a behavior evolved. Nonhuman animals can be more easily studied than humans can: the conditions under which they are raised can be manipulated, their brains altered and probed. And if there is an evolutionary explanation for a human behavior, it could reveal itself in the

study of the analogous behavior in animals. Because of nature's basic parsimony, many aspects of the brain and behavior have been conserved through evolution, meaning that many of the observations that ethologists make in rats, mice and monkeys could apply to humans too.

When it comes to animal play, scientists basically agree that it's mostly mammals that do it, and they basically agree that it's a mystery why they do it, since there are so many good reasons not to. It all seems incredibly wasteful, and nature does not usually tolerate waste.

Play can be costly in terms of energy expenditure. Juveniles spend an estimated 2 to 15 percent of their daily calorie budget on play, using up calories the young animal could more profitably use for growing. Frisky playing can also be dangerous, making animals conspicuous and inattentive, more vulnerable to predators and more likely to hurt themselves as they romp and cavort. Biologists have observed many play-related calamities, like bighorn lambs being injured on cactus plants as they frolicked. One of the starkest measures of the risk of play was made by Robert Harcourt, a zoologist now at Macquarie University in Sydney, Australia, who spent nine months in 1988 observing seal pups off the coast of Peru. Harcourt witnessed 102 seal pups attacked by southern sea lions; 26 of them were killed. "Of these observed kills," Harcourt reported in the British journal Animal Behaviour, "22 of the pups were playing in the shallow tidal pools immediately before the attack and appeared to be oblivious to the other animals fleeing nearby." In other words, nearly 85 percent of the pups that were killed had been playing.

So play can be risky. And, under stress, it tends to disappear. What then would justify, in evolutionary terms, the prevalence of play?

One popular view is the play-as-preparation hypothesis. In this perspective, play evolved because it is good preparation for adulthood. It is a chance for young animals to learn and rehearse the skills they will need for the rest of their lives, and to do so in a secure environment, where mistakes will have few consequences. Proponents of this hypothesis say play is a way — and, not incidentally, a pleasurable way — of getting into muscle memory the generalized movements of survival: chasing, running, probing, tussling. Through play, these movements can be learned when the stakes are low and then retrieved in adulthood, when the setting is less safe and the need more urgent.

The play-as-preparation hypothesis seems logical, and each new observation seems to confirm it. Watch wolf pups at play, and it is easy to see how the biting and wrangling could be baby versions of the actions the pups will need later to assert their dominance or to help the pack kill its prey. Watch 2-year-olds playing at a toy workbench with little

wooden mallets and blocks, and you can picture them as adults employing those same muscles to wield a full-size hammer.

But one trouble with the hypothesis is that the gestures of play, while similar, are not literally the same as the gestures of real life. In fact, the way an animal plays is often the exact opposite of the way it lives. In play-fighting, if one player starts to edge toward victory, he will suddenly reverse roles and move from the dominant to the submissive posture. Or he will stop fighting as hard, something the ethologists call self-handicapping. This is rarely done in real fighting, when the whole point is winning. The targets of play are different, too. In rats, real fighters try to bite one another on the back and the lower flanks; in play fights, they go for the nape of the neck. The gestures players use to nuzzle the neck are not the same ones they need to rehearse if they are to win a serious fight.

Nor is there much experimental evidence to support a connection between youthful playing and adult expertise. One Scottish study of kittens, for instance, tested the hypothesis that ample object play early in life would lead to better hunting later on. The investigator, a psychologist named T. M. Caro then at the University of St. Andrews, found no difference in hunting skills between one group of 11 cats that had been exposed to toys in their youth and a control group of 8 cats that had not.

Now an alternative view is taking hold, based on a belief that there must be something else going on — play not as a literal rehearsal, but as something less direct and ultimately more important. It focuses on the way that play might contribute to the growth and development of the brain.

John Byers started thinking about the brain and play almost by accident. A zoologist at the University of Idaho, Byers had spent years studying the playful antics of deer, pronghorn antelopes and the wild mountain goats called ibex. He knew that play was risky — he had observed ibex kids falling off steep cliffs as they romped — and at first he thought maybe the animals were taking such risks because the motor training helped them get in physical shape for adulthood. But something about this idea troubled him. Play can be exercise, he reasoned, but it was of too short duration to lead to long-term fitness or build muscle tone.

Byers preferred an alternate theory. In almost every species studied, a graph of playfulness looked like an inverted U, increasing during the juvenile period and then falling off around puberty, after which time most animals don’t play much anymore. One winter afternoon in

1993, Byers was roaming the stacks at the University of Idaho library, flipping through books the way you do when you're not quite sure what you're looking for. One book contained a graph of the growth curve of one important region of the brain, the cerebellum, over the juvenile period in the mouse. The growth curve of the mouse cerebellum was nearly identical to the curve of mouse playfulness.

"It was like a light went on in my head," Byers told me from Washington, D.C., where he is temporarily working at the National Science Foundation. "I wasn't thinking specifically about play, but I sort of had a long-term interest in behavioral development." And there it was: a chart that made it look as if rates of play in mice synchronized almost perfectly with growth rates in one critical region of the brain, the area that coordinates movements originating in other parts of the brain.

Intrigued, Byers enlisted the help of a graduate student, Curt Walker, who looked through the scientific literature on cerebellum development in rats and cats. "Then we compared those rates to what was known about the rates of play in those species," Byers said. "And rats and cats showed the same relationship as mice: a match between when they were playing and when the cerebellum was growing."

The synchrony suggested a few things to Byers: that play might be related to growth of the cerebellum, since they both peak at about the same time; that there is a sensitive period in brain growth, during which time it's important for an animal to get the brain-growth stimulation of play; and that the cerebellum needs the whole-body movements of play to achieve its ultimate configuration.

This opened up new lines of research, as neuroscientists tried to pinpoint just where in the brain play had its most prominent effects — which gets to the heart of the question of what might be lost when children do not get enough play. Most of this work has been done in rats. Sergio Pellis, a neuroscientist at the University of Lethbridge in Alberta, Canada, is one of these investigators. He studies how brain damage in rats affects play behavior, and whether the relationship works in reverse: that is, not only whether brain-damaged rats play abnormally but also whether play-deprived rats develop abnormalities in their brains. Pellis's research indicates that the relationship might indeed work in both directions.

In a set of experiments conducted last year, Pellis and his colleagues raised 12 female rats from the time they were weaned until puberty under one of two conditions. In the control group, each rat was caged with three other female juveniles. In the experimental group, each rat was caged with three female adults. Pellis knew from previous studies that the

rats caged with adults would not play, since adult rats rarely play with juveniles, even their own offspring. They would get all the other normal social experiences the control rats had — grooming, nuzzling, touching, sniffing — but they would not get play. His hypothesis was that the brains in the experimental rats would reflect their play-deprived youth, especially in the region known as the prefrontal cortex.

At puberty the rats were euthanized so the scientists could look at their brains. What Pellis and his collaborators found was the first direct evidence of a neurological effect of play deprivation. In the experimental group — the rats raised in a play-deprived environment — they found a more immature pattern of neuronal connections in the medial prefrontal cortex. (This is distant from the cerebellum; it is part of the cerebrum, which constitutes the bulk of the mammalian brain.) Rats, like other mammals, are born with an overabundance of cortical brain cells; as the animal matures, feedback from the environment leads to the pruning and selective elimination of these excess cells, branchings and connections. Play is thought to be one of the environmental influences that help in the pruning — and, this research showed, play deprivation interferes with it.

Figuring out what these findings mean in terms of function involves a certain amount of conjecture. Pellis interprets his observation of a more tangled, immature medial prefrontal cortex in play-deprived rats to mean that the rat will be less able to make subtle adjustments to the social world. But maybe the necessary pruning can happen later in life, through other feedback mechanisms having little to do with play. Maybe there were already compensatory changes happening elsewhere in the brains of these young rats where no one had thought to look. Current research in Pellis's lab, in which the brain is damaged first and the rat's playing ability is measured afterward, seems to confirm that the medial prefrontal cortex has an important role in play. But the exact nature of its action is still not clear.

Many of the other important studies on play and the brain have come from the lab of Jaak Panksepp, a behavioral neuroscientist who trained most of the neurological investigators in the field during the three decades he was at Bowling Green State University in Ohio (though Pellis, who studied at Australia's Monash University, was not among them). In the 1980s, Panksepp and a graduate student, Stephen Siviy, located the play drive in the thalamus, a primitive region of the brain that receives sensory information and relays it to the cortex. More recently, Panksepp has been exploring the connections among the play drive and certain human conditions, in particular attention deficit hyperactivity disorder (A.D.H.D.).

Panksepp has been studying A.D.H.D. in rats since the 1990s. In one experiment, to create a rat model of A.D.H.D., he and his colleagues took 32 newborn rats and destroyed in each

the right frontal cortex, the region of the brain responsible for paying attention, planning ahead and being sensitive to social cues. (Human studies have shown that in children with A.D.H.D., frontal-lobe development is often delayed.) As a control, they performed sham surgery on 32 other rats, making the incisions but leaving the brain intact to be sure that any observed change would be due to the cortical destruction rather than the surgery itself. When the scientists compared the play behavior of the two groups, they found that the rats with the damaged right frontal cortex had higher levels of overall activity, as well as increased rates of roughand- tumble play, as compared with the controls. The rats with damaged frontal cortices behaved much like children described as hyperactive.

Panksepp and his colleagues then exposed these superplayers to extra opportunities for play. One extra hour a day of play, which generally took the form of play-fighting during a critical early stage, sufficed to reduce hyperactivity. The scientists thought similar play therapy might work for children with A.D.H.D., particularly if it was undertaken in early childhood — between ages 3 and 7 — when the urges are "especially insistent."

Panksepp's current view of human A.D.H.D., he told me from his office at Washington State University, where he moved two years ago, is that it is in part "overactivity of play urges in the nervous system." His ideas have made some impression on the human A.D.H.D. community, but not much. Benedetto Vitiello, the head of child and adolescent treatment and research at the National Institute of Mental Health, remembers hearing Panksepp give a talk at the institute around the time his article appeared in 2003. But he said he has not heard of any clinical studies since then that investigate whether extra play in early childhood helps ease the symptoms of A.D.H.D. Besides, Vitiello adds, there are many differences between a rat with a brain injury and a child with an intact but slowly developing brain. So even though he considers Panksepp's research "interesting," he says that it has not quite led to a complete animal model of A.D.H.D.

Animal-play experiments have focused largely on the most vivid form of play — social play, in particular the kind of social play known as play-fighting. But it's clear to anyone who thinks about it that play-fighting is a very narrow definition of play. Wrestling is not the same as chasing. For that matter, playing tag is not the same as playing dress up; playing in a soccer league is not the same as shooting hoops in a neighborhood park; and none of these are the same as playing Scrabble or Uno or video games. For all its variety, however, there is something common to play in all its protean forms: variety itself. The essence of play is that the sequence of actions is fluid and scattered. In the words of Marc Bekoff, an evolutionary biologist at the University of Colorado, play is at its core "a behavioral kaleidoscope."

In fact, it's this kaleidoscopic quality that led Bekoff and others to think of play as the best way for a young animal to gain a more diverse and responsive behavioral repertory. Thus, the currently fashionable flexibility hypothesis, a revival of an idea Bekoff first proposed in the 1970s. If a single function can be ascribed to every form of play, in every playful species, according to this way of thinking, it is that play contributes to the growth of more supple, more flexible brains.

"I think of play as training for the unexpected," Bekoff says. "Behavioral flexibility and variability is adaptive; in animals it's really important to be able to change your behavior in a changing environment." Play, he says, leads to mental suppleness and a broader behavioral vocabulary, which in turn helps the animal achieve success in the ways that matter: group dominance, mate selection, avoiding capture and finding food.

The flexibility hypothesis is something of a bridge between the play-aspreparation hypothesis and more recent findings about play and neurological growth. It works best when explaining play-fighting. With its variable tempo, self-handicapping and role reversals, play-fighting is like the improvisation of a jazz quartet, forcing an animal to respond rapidly to change.

Players riff off one another. One thrusts, the other parries; suddenly the one that was on top is pinned on the bottom and then just as suddenly is on top again. As in jazz, the smoothness of the improvisation matters as much as the gestures themselves. "Ability to use and switch among alternative sequences," Maxeen Biben, an ethologist formerly at the National Institutes of Health, wrote in an essay in "Animal Play," "may be as valuable as getting a lot of practice at the most effective sequences."

The physical movements of playfighting provide the environmental input needed to prune the developing cortex, as Sergio Pellis's research suggested. This pruning is one way an animal achieves the ability to predict and respond to another animal's shifting movements. Some play scholars say that such skills will come in handy in adulthood, not only in fighting but in other real-life situations as well, like evading capture and finding food. A more skeptical view would be that play-fighting might not really teach much at all about an animal's subsequent skills — there was that Scottish study about object play in kittens, remember, that showed no connection to hunting ability in adulthood — but it does one thing for sure: it makes the animal that play-fights a better play-fighter. And there might be something to be said for that. The more a young animal plays, the richer the animal's life, the more fun, the more stimulated, the more social. There might possibly be an immediate benefit just from that simple fact.

Which reveals an important rift in the study of the purpose of play: a debate among play scholars about how to tell the story of play's possible short-term and long-term benefits. The flexibility hypothesis imposes one such story, but it might not be the best story. Just because it's possible to see how playing might contribute to a suppler brain and a more varied behavioral repertory, it does not follow that playing is the only way to achieve such flexibility. This relates to the concept of equifinality, an idea from systems theory that says there are usually more ways than one to arrive at a particular end. The fact that play offers one way of getting to an end need not mean it is the only way — nor need it mean that getting to that end is the ultimate purpose of play.

The problem of equifinality troubled Anthony Pellegrini, a psychologist at the University of Minnesota, when he tried to interpret his findings about rough-and-tumble play in fifth-grade boys. He and his colleagues studied the recess behavior of 37 boys and scored a play episode as rough-and-tumble when a boy engaged in one from a list of behaviors — "tease, hit and kick at, chase, poke, pounce, sneak up, carry child, pile on, play-fight, hold and push" — while displaying a wide smile or "play face." Knowing that earlier studies found a connection between roughand- tumble play and a child's peer affiliation and social problem-solving flexibility, the scientists hypothesized that the most vigorous players would also be the most socially competent. But Pellegrini found no clear benefits in the boys who played the most. Maybe, he wrote in an essay about this research in "The Future of Play Theory," it's because other things that happen at recess — "cooperative social games, comfort contact and conversation" — might be just as good as pouncing or chasing at achieving a sense of connection.

"Developmental systems tend to be highly redundant," wrote Patrick Bateson, a noted biologist at Cambridge University, in a book of essays called "The Nature of Play." This means, Bateson wrote, "that if an endpoint is not achieved by one route, it is achieved by another. Playing when young is not the only way to acquire knowledge and skills; the animal can delay acquisition until it is an adult."

Nonetheless, even Bateson, a prominent play scholar who recognizes the quandary posed by equifinality, suggested that play is the best way to reach certain goals. Through play, an individual avoids what he called the lure of "false endpoints," a problem-solving style more typical of harried adults than of playful youngsters. False endpoints are avoided through play, Bateson wrote, because players are having so much fun that they keep noodling away at a problem and might well arrive at something better than the first, good-enough solution.

But maybe the flexibility hypothesis is itself a false endpoint. Maybe the idea that play is the best route to a whole host of good results — creativity, social agility, overall mental

suppleness — is just the first idea scientists landed on, and they were inclined to accept it because it fit so well with their innate ideas about the nature of childhood. This is the view of a small group of play scholars we'll call the play skeptics. What worries the play skeptics is that most people in the industrialized West — scientists in the field, play advocates and all the rest of us, parents, teachers, doctors, scholars, all the children and all the aging children — have been ensnared by what skeptics call the "play ethos." By this they mean the reflexive, unexamined belief that play is an unmitigated good with a crucial, though vaguely defined, evolutionary function.

"Play ethos" comes from Peter Smith, a psychology professor at the University of London and a leading authority on play's effect on children's emotional development. He uses it as a cautionary term, a reminder that most conclusions about play's adaptive function have so far been based not on scientific evidence but on wishful thinking.

For Smith to suggest that scientists have fallen under the spell of the play ethos is a kind of apostasy, because some of the earliest bits of evidence used to establish the play ethos in the first place came out of Smith's own laboratory at the University of London in the late 1970s. But it was in the execution of those experiments, and the follow- up studies that revealed their fatal flaw, that Smith came to understand, more than most, the importance of caution.

In one of his early experiments, Smith and his colleagues put 3- and 4-year-olds in two different play settings. In one group the children were allowed to play, in whatever way they felt like, with several wooden sticks. In the other group they were shown by an adult "play tutor" how to fit two sticks together to make a longer one. Then the children were given two tasks. First they had to retrieve a marble by connecting two sticks. Both groups performed this task, which Smith called "direct" problem solving, about equally well. Then they had to retrieve a marble that had been pushed farther away, so they could reach it only by connecting three sticks, not just two — what Smith called "innovative" problemsolving. The children who had played with the sticks performed this task significantly better than the ones who had been shown how to join together only two sticks.

"At this point I was happy," Smith recalled years later, writing in "The Future of Play Theory." His findings were taken as evidence that spontaneous free play led to more creative thinking. But then he started to wonder whether he himself had fallen victim to the play ethos.

A single investigator had conducted the entire experiment, serving as both play tutor and evaluator on the problem-solving task. Might the experimenter subconsciously have

favored the free-play children, Smith asked himself, maybe by giving subtle nonverbal cues or scoring more leniently? He ran the experiment again, bringing in a second investigator who could test the children without knowing whether they were in the free-play or the tutored group.

This time Smith found no difference in innovative problem solving between the two groups. At first he didn't believe his new results, thinking that maybe the sample size was too small or that the groups were somehow poorly matched. But further studies bore out this nonfinding, and Smith realized, on reflection, that he and his colleagues had probably been giving inadvertent hints to the free-play group the first time around. He ascribed it to his own subconscious idealization of play.

Idealization is a trap. And it seems most seductive when it comes to play, especially one particular kind: pretend play. This is the kind ethologists tend to ignore, since it is difficult to argue — though a few scientists have tried — that animals are capable of pretending. Yet for humans, pretend play is one of the most crucial forms of play, occupying at its peak at about age 4 some 20 percent of a child's day. It includes some of the most wondrous moments of childhood: dramatic play, wordplay, ritual play, symbolic play, games, jokes and imaginary friends. And it is the kind of play that positively screams out for hyperbole when outsiders try to describe it. This is where even coolheaded scientists get florid in their prose — and where play advocates like Stuart Brown and play skeptics like Peter Smith engage in their most vivid disagreements about the ultimate purpose of play.

Brown talked about pretend play at the New York Public Library last month, saying that a playful imagination "can infuse the moment with a sense of magic." But skeptics find such comments annoying. "Despite the heartwarming rhetoric we dish out in our teacher-training classes, children do *not* have unlimited imagination," wrote David Lancy, an anthropologist at Utah State University. "Their make-believe and, by extension, other play forms, is constrained by the roles, scripts and props of the culture they live in." Lancy pointed to field studies of a Mayan community in which children teach their younger siblings how to pretend in the most pedestrian of ways, "focusing their attention on washing, caring for babies and cooking" — no magic there.

The skeptical Smith does see some value to fantasy play: when children dress up, make and use props and devise story lines to playact, he says, they learn to use sophisticated language, negotiate roles and exchange information. But he adds that many of these benefits could be gained just as well through other forms of play, work activities and plain old-fashioned instruction. Smith does not deny that playing is great fun — his own children were playing noisily in the background when I phoned him at his home in

London, and he never once asked them to hush — but he wants everyone to keep it all in perspective.

Keeping play in perspective means looking at it not just clearly but fully. Not everything about childhood play is sweetness and light, no matter how much we romanticize it. Play can be dangerous or scary. It can be disturbing, destabilizing, aggressive. It can lead to misunderstandings and hurt feelings, leaving children out of the charmed circle of the schoolyard. The other side of playing is teasing, bullying, scapegoating, excluding, hurting.

I well remember this darker side of play from my own girlhood. Like many other klutzy kids, I hated recess, since it stripped me of the classroom competence that was such good cover for my shyness. Out in the schoolyard, there was no raising your hand with the right answer. I had to wait to be asked to play jump-rope and had to face embarrassment if I missed a skip or — worse, much worse — if nobody ended up asking me. Even pretend play could take an ugly turn if my playmates made their dolls say nasty things.

Recognizing play's dark side is not difficult, if we are really willing to search our memories. To play scholars, thinking about play's negatives can be clarifying and might even generate new ideas, not only about play but also about the double-edged nature of pleasure itself. Why is it that something so joyous, something children yearn for so forcefully, can be so troubling too? If you're accustomed to looking for evolutionary explanations for perplexing behavior, here is something meaty to chew on: what could be the adaptive advantage of using play to wrestle your demons?

Demons do indeed emerge at playtime, in part because children carve out play spaces that have no room for the civilizing influence of adults. This is what happened in the recess "fort culture" that arose spontaneously in 1990 at the Lexington Montessori School in Massachusetts, when the elementary-age children shunned the organized play their teachers had arranged and instead started building forts on their own in the surrounding woods. An intricate and rule-bound subculture developed, one that is still going on.

Mark Powell, then a graduate student at Lesley University in Cambridge nearby, observed the recess fort culture for several years in the 1990s and described it in 2007 in the journal Children, Youth and Environments. For the first few years, he wrote, petty conflicts, stick stealing and ejections for minor infractions were a constant background hum in a play culture that was otherwise high-spirited and fun. But it finally erupted into a miniwar one autumn, sparked by the hostile actions of a fort of 6- year-olds headed by a tyrannical little boy who called himself the General. Within a month of the General's appearance, Powell wrote, the fantasy war play "had become a reality with daily raids and counterattacks, yelling, the occasional physical scrape and lots of hurt feelings." It took the intervention of

some other children, teachers and the General's parents finally to persuade the child to call a truce.

Brian Sutton-Smith, one of the nation's most eminent play scholars, has seen eruptions like the General's many times before, but they don't worry him. In fact, he embraces them. In such an elaborate play culture, he wrote, where so many harsh human truths come to the fore, "children learn all those necessary arts of trickery, deception, harassment, divination and foul play that their teachers won't teach them but are most important in successful human relationships in marriage, business and war."

Sutton-Smith's 1997 classic, "The Ambiguity of Play," reflects in its title his belief that play's ultimate purpose can be found in its paradoxes. During his years at Columbia's Teachers College and the University of Pennsylvania, Sutton- Smith, a psychologist and folklorist, took careful note of how play could be destabilizing, destructive or disturbing. He collected renditions of the stories children told in their imaginative or dramatic play, stories of "being lost, being stolen, being bitten, dying, being stepped on, being angry, calling the police, running away or falling down." Are these really the thoughts percolating inside our children? And is expressing these thoughts through play somehow good for them? Sutton-Smith called this underbelly of imaginative play part of the "phantasmagoria," where children's thoughts run wild and all the chaotic bits of the real world get tumbled together and pulled haphazardly apart in new, sometimes even scarier confabulations.

Why would such an enriching activity as play also be a source of so much anarchy and fear? Sutton- Smith found one possible answer by reading Stephen Jay Gould, the author and evolutionary biologist. The most highly adaptive organisms, Gould wrote, are those that embody both the positive and the negative, organisms that "possess an opposite set of attributes usually devalued in our culture: sloppiness, broad potential, quirkiness, unpredictability and, above all, massive redundancy." Finely tuned specific adaptations can lead to blind alleys and extinction, he wrote; "the key is flexibility."

What Gould called quirkiness, Sutton-Smith called play. "Animal play has been described by many investigators as fragmentary, disorderly, unpredictable and exaggerated," Sutton-Smith wrote, and "child play has been said to be improvised, vertiginous and nonsensical." The adaptive advantage to a behavior that is multifaceted, then, is that pursuing it, enjoying it, needing it to get through the day, allows for a wider range in a play-loving person's behavioral repertory, which is always handy, just in case.

Playing might serve a different evolutionary function too, he suggests: it helps us face our existential dread. The individual most likely to prevail is the one who believes in

possibilities — an optimist, a creative thinker, a person who has a sense of power and control. Imaginative play, even when it involves mucking around in the phantasmagoria, creates such a person. "The adaptive advantage has often gone to those who ventured upon their possibility with cries of exultant commitment," Sutton-Smith wrote. "What is adaptive about play, therefore, may be not only the skills that are a part of it but also the willful belief in acting out one's own capacity for the future."

It's a pretty idea, the notion that play gives you hope for a better tomorrow, but science demands something a little less squishy. Science demands that if there are important long-term benefits to play, they must be demonstrated. That is why studies of play-deprived rats are so fascinating; they offer objective evidence that in at least some animals, insufficient play can have serious consequences.

Even when science suggests certain answers, however, it cannot easily make the leap from young rats to young humans, nor tell us much of anything about how those young children should behave. What if all the things we hope children derive from free play — cognitive flexibility, social competence, creative problem-solving, mastery of their own bodies and their own environments — can be learned just as well by teaching these skills directly? What if the only clear advantage to the vanishing 20-minute recess is that it makes kids less restless in class, something that can be just as easily accomplished by a jog around the all-purpose room?

Which brings us back to wondering what would be lost if the Cassandras are right, whether children would suffer if free play really does turn out to be a thing of the past. It seems almost ludicrous to ask such a question. Of course play is good for something; it is the essence of good. Watch children at play, and the benefits are so obvious: just look at those ecstatic faces, just listen to those joyful squeals. Stuart Brown alluded to it in his library talk last month. "Look at life without play, and it's not much of a life," he told the audience. "If you think of all the things we do that are playrelated and erase those, it's pretty hard to keep going." Without play, he said, "there's a sense of dullness, lassitude and pessimism, which doesn't work well in the world we live in."

In the end, it comes down to a matter of trade-offs. There are only six hours in a school day, only another six or so till bedtime, and adults are forever trying to cram those hours with activities that are productive, educational and (almost as an afterthought) fun. Animal findings about how play influences brain growth suggest that playing, though it might look silly and purposeless, warrants a place in every child's day. Not too overblown a place, not too sanctimonious a place, but a place that embraces all styles of play and that recognizes play as every bit as essential to healthful neurological development as test-taking drills, Spanish lessons or Suzuki violin.