ALISON GOPNIK

THE PHILOSOPHICAL BABY

what children's minds tell us about truth, love & the meaning of life

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Introduction

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A one-month-old stares at her mother's face with fixed, brow-wrinkling concentration, and suddenly produces a beatific smile. Surely she must see her mother and feel love, but what are seeing and feeling like for her? What is it like to be a baby? A two-year-old offers a hungry-looking stranger a half-chewed lollipop. Could a child this young already feel empathy and be altruistic? A three-year-old announces that she will come to dinner only if a place is laid for the Babies, the tiny purple-haired twins who live in her pocket and eat flowers for breakfast. How could she believe so profoundly in something that is just a figment of her own imagination? And how could she dream up such remarkable creatures? A five-year-old discovers, with the help of a goldfish, that death is irreversible. How could a child who can't yet read or add uncover deep, hard truths about mortality? The one-month-old turns into the two-year-old and then the three-year-old and the five-year-old and eventually, miraculously, turns into a mother with children of her own. How could all these utterly different creatures be the same person? All of us once were

children and most of us will become parents—we have all asked these sorts of questions.

Childhood is a profound part of the human condition. But it is also a largely unexamined part of that condition—so taken for granted that most of the time we hardly notice it at all. Childhood is a universal fact, but when we do think about it, it is almost always in individual first-person terms: What should I do, now, about *my* child? What did *my* parents do that led *me* to be the way I am? Most books about children are like this, from memoirs and novels to the ubiquitous parenting advice books. But childhood is not just a particular plot complication of Irish autobiographies or a particular problem to be solved by American self-help programs. It is not even just something that all human beings share. It is, I'll argue, what makes all human beings human.

When we start to think about childhood more deeply, we realize that this universal, apparently simple fact is riddled with complexities and contradictions. Children are, at once, deeply familiar and profoundly alien. Sometimes we feel that they are just like us—and sometimes they seem to live in a completely different world. Their minds seem drastically limited; they know so much less than we do. And yet long before they can read or write they have extraordinary powers of imagination and creativity, and long before they go to school they have remarkable learning abilities. Their experience of the world sometimes seems narrow and concrete; at other times it looks far more wide-ranging than adult experience. It seems that our experiences as children were crucial in shaping who we are. And yet we all know that the path from child to adult is circuitous and complex, and that the world is full of saints with terrible parents and neurotics with loving ones.

The younger children are, the more mysterious they are. We can more or less remember what it was like to be five or six, and

we can talk with school-age children on a reasonably equal basis. But babies and toddlers are utterly foreign territory. Babies can't walk or talk, and even toddlers, well, toddle, and yet science, and indeed common sense, tells us that in those early years they are learning more than they ever will again. It may be hard to see just how the child is father to the man. Yet it is even more difficult to trace the link between the "I" writing this page and the seven-pound bundle of fifty years ago, all eyes and forehead, or even the later thirty-pound whirlwind of tangled sentences, intense emotions, and wild pretend play. We don't even have a good name for this age range. This book will focus on children under five and I'll sometimes use the word "babies" to talk about anybody younger than three. For me "babies" means that particularly adorable combination of chubby cheeks and funny pronunciation, though I recognize that many three-year-olds themselves would reject the description vigorously.

New scientific research and philosophical thinking have both illuminated and deepened the mystery. In the last thirty years, there's been a revolution in our scientific understanding of babies and young children. We used to think that babies and young children were irrational, egocentric, and amoral. Their thinking and experience were concrete, immediate, and limited. In fact, psychologists and neuroscientists have discovered that babies not only learn more, but imagine more, care more, and experience more than we would ever have thought possible. In some ways, young children are actually smarter, more imaginative, more caring, and even more conscious than adults are.

This scientific revolution has led philosophers to take babies seriously for the first time. Children are both profound and puzzling, and this combination is the classic territory of philosophy. Yet you could read 2,500 years of philosophy and find almost nothing

about children. A Martian who tried to figure us out by studying Earthling philosophy could easily conclude that human beings reproduce by asexual cloning. The index of the thousands of pages in the 1967 *Encyclopedia of Philosophy* had no references to babies, infants, families, parents, mothers, or fathers, and only four to children at all. (There are hundreds of references to angels and the morning star.)

Very recently, however, this has begun to change. Philosophers have started to pay attention to babies and even to learn from them. The current *Encyclopedia of Philosophy* includes articles that are actually about babies, with titles such as "Infant Cognition" and "The Child's Theory of Mind." I talk at the American Philosophical Association as well as the Society for Research in Child Development, and philosophers argue about when babies understand the minds of others, how they learn about the world, and whether they are capable of empathy. A few even sit precariously on little chairs in preschools and do experiments with children. Thinking about babies and young children can help answer fundamental questions about imagination, truth, consciousness, identity, love, and morality in a new way. In this book I'll argue for a new view of these fundamental philosophical ideas, based on babies, and a new view of babies, based on these philosophical ideas.

HOW CHILDREN CHANGE THE WORLD

There's one big, general idea behind all the specific experiments and arguments in this book. More than any other creature, human beings are able to change. We change the world around us, other people, and ourselves. Children, and childhood, help explain how we change. And the fact that we change explains why children are the way they are—and even why childhood exists at all.

Ultimately, the new scientific explanations of childhood are rooted in evolutionary theory. But studying children leads to a very different picture of how evolution shapes our lives than the traditional picture of "evolutionary psychology." Some psychologists and philosophers argue that most of what is significant about human nature is determined by our genes—an innate hardwired system that makes us who we are. We're endowed with a set of fixed and distinct abilities, designed to suit the needs of our prehistoric ancestors 200,000 years ago in the Pleistocene. Not surprisingly, this view discounts the importance of childhood. The picture is that a "good enough" childhood environment may be necessary to let the innate aspects of human nature unfold. But beyond that, childhood won't have much influence because most of what is important about human nature in general, and individual character in particular, is in place at birth.

But this view doesn't capture our lives as we actually live them and as they change and develop over time. We at least feel as if we actively create our lives, changing our world and our selves. This view also can't explain the radical historical changes in human life. If our nature is determined by our genes, you would think that we would be the same now as we were in the Pleistocene. The puzzling fact about human beings is that our capacity for change, both in our own lives and through history, is the most distinctive and unchanging thing about us. Is there a way of explaining this flexibility and creativity, this ability to alter our individual and collective fate, without resorting to mysticism?

The answer, unexpectedly, comes from very young children—and it leads to a very different kind of evolutionary psychology. The great evolutionary advantage of human beings is their ability to escape from the constraints of evolution. We can learn about our environment, we can imagine different environments, and we

can turn those imagined environments into reality. And as an intensely social species, other people are the most important part of our environment. So we are particularly likely to learn about people and to use that knowledge to change the way other people behave, and the way we behave ourselves. The result is that human beings, as a central part of their evolutionary endowment, and as the deepest part of their human nature, are engaged in a constant cycle of change. We change our surroundings and our surroundings change us. We alter other people's behavior, their behavior alters ours.

We begin with the capacity to learn more effectively and more flexibly about our environment than any other species. This knowledge lets us imagine new environments, even radically new environments, and act to change the existing ones. Then we can learn about the unexpected features of the new environment that we have created, and so change that environment once again and so on. What neuroscientists call plasticity—the ability to change in the light of experience—is the key to human nature at every level from brains to minds to societies.

Learning is a key part of the process, but the human capacity for change goes beyond just learning. Learning is about the way the world changes our mind, but our minds can also change the world. Developing a new theory about the world allows us to imagine other ways the world might be. Understanding other people and ourselves lets us imagine new ways of being human. At the same time, to change our world, our selves, and our society we have to think about what we ought to be like, as well as what we actually are like. This book is about how children develop minds that change the world.

Psychologists, philosophers, neuroscientists, and computer

scientists are beginning to carefully and precisely identify some of the underlying mechanisms that give us this distinctively human capacity for change—the aspects of our nature that allow nurture and culture to take place. We even are starting to develop rigorous mathematical accounts of some of those mechanisms. We'll see that this new research and thinking, much of it done just in the past few years, has given us a new understanding of how the biological computers in our skulls actually produce human freedom and flexibility.

If I look around at the ordinary things in front of me as I write this—the electric lamp, the right-angle-constructed table, the brightly glazed symmetrical ceramic cup, the glowing computer screen—almost nothing resembles anything I would have seen in the Pleistocene. All of these objects were once imaginary—they are things that human beings themselves have created. And I myself, a woman cognitive scientist writing about the philosophy of children, could not have existed in the Pleistocene either. I am also a creation of the human imagination, and so are you.

HOW CHILDHOOD CHANGES THE WORLD

The very fact of childhood—our long protected period of immaturity—plays a crucial role in this human ability to change the world and ourselves. Children aren't just defective adults, primitive grown-ups gradually attaining our perfection and complexity. Instead, children and adults are different forms of *Homo sapiens*. They have very different, though equally complex and powerful, minds, brains, and forms of consciousness, designed to serve different evolutionary functions. Human development is more like metamorphosis, like caterpillars becoming butterflies,

than like simple growth—though it may seem that children are the vibrant, wandering butterflies who transform into caterpillars inching along the grown-up path.

What *is* childhood? It's a distinctive developmental period in which young human beings are uniquely dependent on adults. Childhood literally couldn't exist without caregivers. Why do we go through a period of childhood at all? Human beings have a much more extended period of immaturity and dependence, a much longer childhood, than other species, and this period of immaturity has become longer as human history has gone on (as we parents of twenty-somethings may recognize with a sigh). Why make babies so helpless for so long, and why make adults invest so much time and energy in caring for them?

This protracted period of immaturity is intimately tied up with the human capacity for change. Our human capacities for imagination and learning have great advantages; they allow us to adapt to more different environments than any other species and to change our own environments in a way that no other animal can. But they also have one great disadvantage—learning takes time. You don't want to be stuck exploring all the new possible ways to hunt deer when you haven't eaten for two days, or learning all the accumulated cultural wisdom about saber-toothed tigers when one is chasing you. It would be a good idea for me to spend a week exploring all the capabilities of my new computer, as my teenage son would, but with the saber-toothed tigers of grant deadlines and classes breathing down my neck, I'll just go on relying on the old routines.

An animal that depends on the accumulated knowledge of past generations has to have some time to acquire that knowledge. An animal that depends on imagination has to have some time to exercise it. Childhood is that time. Children are protected from

the usual exigencies of adult life; they don't need to hunt deer or ward off saber-toothed tigers, let alone write grant proposals or teach classes—all of that is done for them. All they need to do is learn. When we're children we're devoted to learning about our world and imagining all the other ways that world could be. When we become adults we put all that we've learned and imagined to use.

There's a kind of evolutionary division of labor between children and adults. Children are the R&D department of the human species—the blue-sky guys, the brainstormers. Adults are production and marketing. They make the discoveries, we implement them. They think up a million new ideas, mostly useless, and we take the three or four good ones and make them real.

If we focus on adult abilities, long-term planning, swift and automatic execution, rapid skillful reaction to the deer and the tigers and the deadlines, then babies and young children will indeed look pretty pathetic. But if we focus on our distinctive capacities for change, especially imagination and learning, then it's the adults who look slow. The caterpillars and butterflies do different things well.

This basic division of labor between children and adults is reflected in their minds, their brains, their everyday activities, and even their conscious experience. Babies' brains seem to have special qualities that make them especially well suited for imagination and learning. Babies' brains are actually more highly connected than adult brains; more neural pathways are available to babies than adults. As we grow older and experience more, our brains "prune out" the weaker, less used pathways and strengthen the ones that are used more often. If you looked at a map of the baby's brain it would look like old Paris, with lots of winding, interconnected little streets. In the adult brain those little streets have been replaced by fewer but more efficient neural boulevards,

capable of much more traffic. Young brains are also much more plastic and flexible—they change much more easily. But they are much less efficient; they don't work as quickly or effectively.

There are even more specific brain changes that play a particularly important role in the metamorphosis from childhood to adulthood. They involve the prefrontal cortex, a part of the brain that is uniquely well developed in human beings, and that neuroscientists often argue is the seat of distinctively human abilities. Scientists have located sophisticated capacities for thinking, planning, and control in the prefrontal area. For example, through a tragic combination of error and arrogance, psychiatric patients in the fifties were subjected to prefrontal lobotomies—operations that removed this part of their brains. Although these patients remained superficially functional, they had largely lost the ability to make decisions, to control their impulses, and to act intelligently.

The prefrontal cortex is one of the last parts of the brain to mature. The wiring of this part of the cortex, the process of pruning out some connections and strengthening others, may not be complete until the mid-twenties (another sigh from parents of twenty-somethings). Recently neuroscientists have discovered that all of the brain is more plastic and changeable, even in adulthood, than we ever thought before. Still, some parts, the visual system, for example, seem to take their adult form in the first few months of life. Others, like the prefrontal cortex, and the connections between the prefrontal area and other parts of the brain, mature much more slowly. They continue to change through adolescence and beyond. The visual cortex is much the same at six months and sixty, while the prefrontal area takes on its final form only in adulthood.

You might think this means that children are defective adults, that they lack the parts of the brain that are most crucial for ra-

tional adult thought. But you could equally say that, when it comes to imagination and learning, prefrontal immaturity allows children to be superadults. The prefrontal cortex is especially involved in "inhibition." It actually helps shut down other parts of the brain, limiting and focusing experience, action, and thought. This process is crucial for the complex thinking, planning, and acting that adults engage in. To execute a complex plan, for example, you have to perform just the actions that are dictated by that plan, and not all the other possible actions. And you have to pay attention to just the events that are relevant to your plan and not all the others. Anyone who tries to persuade a three-year-old to get dressed for preschool will develop an appreciation of inhibition. It would be so much easier if he didn't stop to explore every speck of dust on the floor, pull out all the drawers in turn, and take off his socks just after you've put them on.

But, as we'll see, inhibition has a downside if you are primarily interested in imagination and learning. To be imaginative, you want to consider as many possibilities as you can, even wild and unprecedented ones (maybe the dresser would work better without all those drawers). In learning, you want to remain open to anything that may turn out to be the truth (maybe that speck of dust holds the secret of the universe). The lack of strong prefrontal control may actually be a benefit of childhood.

In another sense the prefrontal cortex is the *most* active part of the brain during childhood, it constantly changes throughout those years, and its final form depends heavily on childhood experience. The powers of imagination and learning during childhood provide us with the information that we adults use to plan and control our behavior intelligently. In fact, there is some evidence that high IQ is correlated with later maturing and more plastic

frontal lobes. Keeping your mind open longer may be part of what makes you smarter.

Those different brains and minds mean that adults and children also spend their days differently—we work, babies play. Play is the signature of childhood. It's a living, visible manifestation of imagination and learning in action. It's also the most visible sign of the paradoxically useful uselessness of immaturity. By definition, play—the baby nesting blocks and pushing the buttons of a busy box, the toddler pretending to be everything from a mermaid to a ninja—has no obvious point or goal or function. It does nothing to advance the basic evolutionary goals of mating and predation, fleeing and fighting. And yet these useless actions—and the adult equivalents we squeeze into our workday—are distinctively, characteristically human and deeply valuable. Plays are play, and so are novels, paintings, and songs.

All these differences between children and adults suggest that children's consciousness, the texture of their everyday experience of the world, must be very different from ours. Children's brains and minds are radically different from ours, so their experience must be too. These differences are not just a source of idle wonder. We can actually use what we know about children's minds and brains to explore their consciousness. We can use the tools of psychology, neuroscience, and philosophy to understand the inner lives of children. In turn, understanding children's consciousness gives us a new perspective on our everyday adult consciousness and on what it means to be human.

These differences also raise intriguing questions about identity. Babies and adults are radically different creatures with different minds, brains, and experiences. But from another perspective we adults are just the final product of childhood. Our brains are the brains that were shaped by experience, our lives are the lives

that began as babies, our consciousness is the consciousness that reaches back to childhood. The Greek philosopher Heraclitus said that no man ever steps in the same river twice because neither the river nor the man is the same. Thinking about children and childhood makes it vivid that our lives, and our history as a species, are that sort of ever-changing perpetually flowing river.

All the processes of change, imagination, and learning ultimately depend on love. Human caregivers love their babies in a particularly intense and significant way. That love is one of the engines of human change. Parental love isn't just a primitive and primordial instinct, continuous with the nurturing behavior of other animals (though certainly there are such continuities). Instead, our extended life as parents also plays a deep role in the emergence of the most sophisticated and characteristically human capacities. Our protracted immaturity is possible only because we can rely on the love of the people who take care of us. We can learn from the discoveries of earlier generations because those same loving caregivers invest in teaching us. It isn't just that without mothering humans would lack nurturance, warmth, and emotional security. They would also lack culture, history, morality, science, and literature.

A ROAD MAP

In the first three chapters of this book, I'll explore the philosophical thinking and psychological research behind our new understanding of imagination and learning. Even the youngest babies know a great deal about how the world works. And yet toddlers spend most of their waking hours in wild pretend worlds, politely drinking imaginary tea and ferociously battling imaginary tigers. Why? In chapter 1, I'll explain how knowledge and imagination are

intertwined. Children use their knowledge to construct alternate universes—different ways the world might be.

Children also know a great deal about how people work. This lets them imagine new ways that people, including themselves, might think or act. In chapter 2, I'll explain how those abilities lead children to create imaginary friends—and lead grown-ups to create plays and novels. Imagining how they could be different actually lets children, and adults, become different. We can turn ourselves into our imaginary alter egos.

In chapter 3, I'll show where knowledge and imagination come from. Philosophers of science and computer scientists have developed new ideas about how learning and imagination are possible—ideas that have actually been used to design computers that can learn and imagine. These ideas can also explain how children learn and imagine as much as they do. I'll show that babies, like scientists, use statistics and experiments to learn about the world. But they also have a particularly powerful and distinctively human way of learning: they have caregivers who teach them. These kinds of learning allow us to constantly change our view of the world and of the possibilities it offers.

In the next two chapters I'll talk about consciousness. Is the way we see the world as adults the way we always have and always will see the world? Or could consciousness itself change? What is it like to be a baby? There are two very different aspects of consciousness in grown-ups. First there is our external consciousness—our vivid awareness of the world outside us, the blue of the sky, the song of the birds. In chapter 4, I'll describe new studies of babies' minds and brains, and especially babies' attention. Babies attend to the world in a very different way than we do, and this kind of attention is related to their extraordinary learning abilities. I'll

argue that babies are actually more conscious than we are, more vividly aware of everything that goes on around them.

We also experience internal consciousness. This is the stream of thoughts, feelings, and plans that seem to run past that inner "I" who is also the inner "eye"—the internal observer, autobiographer, and executive we call our self. In chapter 5, I'll argue that this internal consciousness may be quite different for babies and toddlers, and adults. Babies experience the past and the future, memory and desire, very differently than we do. They don't seem to have the same kind of inner observer, and they remember the past and plan for the future in very different ways. A single unified self is something we create—not something we are given.

In the next three chapters, I'll consider what these new ideas can tell us about another set of questions—questions about identity, love, and morality. These are often the most urgent questions for us as parents of our children, and indeed as children of our parents. In chapter 6, I'll talk about the relation between our lives as children and our lives as adults. How do the experiences and actions of childhood shape our later experiences and actions? How does our childhood make us who we are? In chapter 7, I'll focus on a particular part of this question. Where does the love between parents and children come from? How does it shape our adult loves and lives? I'll argue that we aren't simply determined by either our genes or our mothers. Instead, our childhood experiences guide the way we create our own lives.

In chapter 8, I'll explain what children tell us about our moral lives. Babies and young children are not the amoral creatures we once thought. Even the youngest babies have striking capacities for empathy and altruism. And even toddlers know that rules should be followed but that they can be changed. These two capacities,

capacities for love and law, for caring about others and following the rules, allow our characteristically human combination of moral depth and flexibility. They explain how we can change our laws and rules to suit new circumstances without falling into moral relativism.

Finally, in chapter 9, I'll talk about the spiritual significance of babies—about babies and the meaning of life. For most parents, raising children is one of the most significant, meaningful, and profound experiences of their lives. Is this just an evolutionary illusion, a trick to make us keep on reproducing? I'll argue that it's the real thing, that children really do put us in touch with truth, beauty, and meaning.

Nothing in this book will help parents get their children to sleep or send them to a good college or guarantee them a happy adult life. But I hope it will help parents, and people who aren't parents too, to appreciate the richness and significance of childhood in a new way. Even the most mundane facts of three-year-old life—the extravagant pretend play, the insatiable curiosity that makes them get into just about everything, and the intuitive sympathy for others—tell us what it means to be human. Philosophy and science can help us understand how our children think and feel and experience the world—and how we do too.

planned but Mr. Crane's flight was delayed till 6:25 and Mr. Crane sees it take off as he arrives. Who is more upset?

Just about everyone agrees that Mr. Crane, who just missed his flight, will be much more unhappy. But why? They both missed their flights. It seems that what is making Mr. Crane unhappy is not the actual world but the counterfactual worlds, the ones in which the taxi arrived just that much earlier or the plane was delayed just a few minutes more.

You needn't turn to artificial scenarios like this one to see the effects of counterfactuals. Consider the medalists in the Olympics. Who is happier, the bronze medalist or the silver? You'd think that objectively the silver medalist, who, after all, has actually done better, would be happier. But the relevant counterfactuals are very different for the two. For the bronze medalist the relevant alternative was to finish out of the medals altogether—a fate she has just escaped. For the silver medalist, the relevant alternative was to get the gold medal—a fate she has just missed. And, in fact, when psychologists took clips of the medals ceremonies and analyzed the facial expressions of the athletes, it turned out that the bronze medalists really do look happier than the silver medalists. The difference in what might have been outweighs the difference in what is.

Like Mr. Crane at the airport, or the silver medalist, people are most unhappy when a desirable outcome seems to be just out of reach, or to have just been missed. As Neil Young adapted John Greenleaf Whittier: "The saddest words of tongue and pen are these four words, 'it might have been.'"

Why do we humans worry so much about counterfactuals, when, by definition, they are things that didn't actually happen? Why are these imaginary worlds just as important to us as the real ones? Surely "it is, and it's awful" should be sadder words than "it might have been."

Keane. I finished *The Philosophical Baby* thanks to a Moore Distinguished Visiting Scholar fellowship at another magnificent institution, the California Institute of Technology. I am also very grateful to all the friends and colleagues at Caltech who read and commented on the manuscript, including Jim Woodward, Chris Hitchcock, Jiji Zhang, Dominic Murphy, Zoltan Nadasdy, and Fiona Cowie. Christof Koch was especially helpful in educating me about the neuroscience of consciousness.

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"Baby Bayes Nets" into the world with him has been a great satisfaction and joy.

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This book argues that, for all human beings, children and families are among the greatest sources of meaning, truth, and love. I may be accused of overgeneralizing from my own experience—my own family has unquestionably been the most important part of my life. My parents, Myrna and Irwin, and my siblings, Adam, Morgan, Hilary, Blake, and Melissa, are the foundation of everything I am and everything I do. Adam and Blake played an especially important role in this book. Adam read drafts, suggested titles, and gave invaluable literary advice. And, at a difficult time in my life, Blake consoled and counseled and talked and talked and talked. This book is dedicated to him with love and gratitude. Finally, my own children, Alexei, Nicholas, and Andres Gopnik-Lewinski, are, simply, the meaning of my life, and I am deeply grateful to them and their father, George Lewinski.

I am lucky that this book was written in beautiful places, in Stanford and Berkeley and Caltech. But the happiest writing was in the most beautiful place of all—Alvy Ray Smith's tranquil and

serene beach house on Puget Sound. It is emblematic of the intelligence and art, happiness and peace, and love and companionship that he has brought to my life, not to mention the formatting skills. The bibliography of this book alone would justify endless gratitude; I can't possibly be thankful enough for all the rest.

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