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RETURN FAX: 718-246-8220

"HOW ARE THE CHILDREN?"

REPORT OF
THE WHITE HOUSE CONFERENCE
ON EARLY DEVELOPMENT AND LEARNING

"During my recent trip to Africa, I was struck by a greeting I heard. In many African cultures, when you meet someone you know on the road or at the market, you don't say: Hello, how are you? Instead you ask: *Hello, how are the children?*"

Hillary Rodham Clinton

MILESTONES:

PRESIDENTIAL INITIATIVES IN TEN KEY AREAS TO SUPPORT CHILDREN AND FAMILIES

1. ***Early Care and Education***

- The President's balanced budget plan includes the largest education funding increase in more than thirty years, aimed at improving learning and teaching for 44 million children in more than 85,000 schools.
- Enrollment in Head Start, which provides comprehensive services for disadvantaged preschoolers (aged three to five) and their families, has been expanded by 43% over the last four years, and will be expanded again by at least 33% in the coming year.
- Early Head Start was established in 1994 to bring the educational, nutritional, and other services of Head Start to children from low-income families who are aged three and younger, and to improve care for pregnant women.
- The Welfare Reform Bill allocated $4-billion to help states provide affordable child care.
- The President has issued an Executive Memo, asking the Department of Defense to share its success in early care and education by partnering with civilian child care centers.
- As part of the America Reads challenge, a tool kit called "Ready, Set, Read" has been developed to strengthen children's reading readiness skills.

2. ***Health Coverage***

- The President's balanced budget plan will extend coverage to as many as five million uninsured children by the year 2000.
- The budget plan includes initiatives to strengthen Medicaid for poor children and children with disabilities; provide coverage for working families through innovative state programs; and continue health care coverage for children of workers who are between jobs.

Preventive Health Care and Nutrition

- The Newborns' and Mothers' Health Protection Act, signed into law in 1996, requires health insurers to let all new mothers and their babies stay in the hospital for at least 48 hours following normal deliveries. This law recognizes that tragedies can be averted if professionals have more than one day to monitor newborns' health. At the same time, mothers need more than 24 hours in the hospital not only to recover from labor, but also to receive instruction in (or refresh their memories

about) basic infant care.

- In 1993, Congress adopted the Vaccines for Children program which provides free vaccines to needy children though private doctors as well as clinics. This initiative also includes state funding to improve outreach and education, lengthen clinic hours, hire additional staff, and expand services.
- The Special Supplemental Nutrition Program for Women, Infants and Children (WIC) has been expanded by nearly two million participants.
- The Child Nutrition Program*
- Food Quality Protection Act and Safe Drinking Water Act*
- The Department of Agriculture has launched Team Nutrition, a partnership among the federal government, states, school districts, farmers, and business leaders to promote healthy food choices in homes, in schools, and in the media.

Family Income

- The Earned Income Tax Credit has been expanded dramatically so that lower-income working parents can keep more of their earnings. This benefits the more than 25 million children they are raising.
- Great strides have been made in the collection of child support payments.*

Safety

- The Safe Start initiative, launched this year, will train police officers, prosecutors, probation and patrol officers in child development so that they will be equipped to handle situations involving young children.
- New standards for passive restraints for children in cars have been implemented.
- The "Back to Sleep" Campaign has been launched to reduce the incidence of SIDS—Sudden Infant Death Syndrome.

Family Leave

- The Family and Medical Leave Act was passed, allowing employees who have a sick parent or a newborn to take time off from work without losing their jobs. Since it was signed into law in 1993, more than 12 million workers have taken leave for reasons covered by the law.
- Efforts are now underway to expand the Family and Medical Leave Act, and to enact a form of flex-time which will give parents the option of forgoing overtime pay in order to spend time with their children.

TV Viewing

- Telecommunications legislation passed in 1996 requires TV manufacturers to install a V-chip in new models. This computer will let parents block TV programs that are designated as unsuitable for children.

- V-chip legislation spurred broadcasters to introduce a television rating system,giving parents the information they need to guide their children's television viewing.

Substance Abuse

- The Safe and Drug-Free Schools and Communities program helps nearly every school district in the nation fight drug abuse and reduce violence.

- Measures have been taken to limit children's access to tobacco, alcohol, and drugs, and to place more stringent limits on advertising for these substances that targets young people.*

Environmental Risk Reducation

- In 1997, the President issued an Executive Order aimed at reducing environmental health and safety risks to children.

- Administrative actions have been taken to protect children from lead, second-hand smoke, and other toxins in the air.*

Research

- Over the last four years, funding for research on children's health and development at the National Institutes of Health has been expanded by 25 percent—or $322 million. The President's balanced budget plan further increases funding for research.

**Need more specific information. RS*

I. HELP WANTED

JOB OF A LIFETIME

***Job of a lifetime*: Seven days per week, long hours, high stress. No pay, no vacations, no sick days, no family leave. On call round-the-clock. Bottom-line responsibility and life-and-death decision-making. No experience required.**

There's no doubt about it—raising a young child is the world's toughest job. What's more, it is getting harder all the time. The world is more complex and is moving at a faster pace. Fewer new parents live close to extended family. And now that most mothers of preschoolers are employed outside of the home, more and more Americans are struggling to balance the responsibilities of families and work. For most families, the time crunch is more severe than ever before.

Generations of parents need no convincing that raising children is taxing, both physically and emotionally. But it requires not only stamina, but also skill; not only nerve, but also knowledge. Moreover, raising children cannot be done completely alone. It requires not only common sense, but also common ground with other members of one's family and community who share a stake in the children's future.

And the stakes are high, indeed. Few jobs are more vital to the well-being of children and society as a whole than parenthood. Yet few jobs are undertaken with so little solid information or training. Most Americans have many more resources at their fingertips to help them operate a VCR or a microwave --such as owner manuals, LCD readouts, or toll-free customer support numbers—than they have to help them care for a newborn.

No wonder parents are worried. Many go to bed at night convinced that they haven't spent enough quality time with their children. More than half of today's parents believe they are not doing as good a job at childrearing as their own parents did.[1]

Recent polls confirm that few first-time parents feel fully prepared for their new role; those who are the youngest and have the lowest income, and those who are going it alone as single parents, feel particularly unprepared. But surveys are not the only indications that people who have responsibility for young children want help. Existing family support and parent education services are at full capacity, books and magazines on child care are widely read, and on-line parent resources are expanding. Pediatricians say they are frustrated that they have so little time to respond to parents' long lists of questions and concerns, and some are restructuring their practices to meet this need. Executives at one corporation that set up an 800 number for parents report that the help lines has been flooded with calls, and say that they have been amazed that so many people would turn to unseen advisers for counsel and support.

Parents are turning to community resources for help, but they also want leaders at all levels of government to respond to their need. Letters addressed to the President and the First Lady often sound this theme. (Examples—if available).

THE WHITE HOUSE CONFERENCE

The bottom line is that parents want help. They are aware of new research on early brain development, and according to a recent survey, parents want to know more. Sixty percent say they are "extremely" or "very" interested in this subject, and another 21 are "fairly" interested.

Sounds like response to a poll.

That is why the President convened the *White House Conference on Early Development and Learning: What New Research on the Brain Tells Us About Our Youngest Children.* The Conference brought together experts on brain development, as well as specialists in child development, early care and education, and family support. Speakers included not only scientists, but also a former first-grade teacher who founded an organization that changed the lives of thousands of children in her Mexican American community; a parent whose experiences in an early childhood PTA gave her new confidence and competence as she raised her young son; a celebrated Hollywood filmmaker who is focusing the nation's attention on the early years of life; and a CEO who is determined to provide households all over the nation with information about early development. At scores of satellite sites all over the nation, thousands of other participants listened to the panelists and held their own discussions.

More comprehensive description of conference

The Conference sought to tie research to action, and to help Americans understand what recent research means for them and their children. It was undertaken with full knowledge that this would not be an easy task. It is not rocket science, but it is brain science. The concepts are complex, and there are many opportunities for misunderstanding. There was concern that parents might come away worried or guilt-ridden.

This doesn't seem to connect to above

More explicit quotation from Conference

"There is a wide gap between scientific research and public knowledge, between

what is known about early development and what we do about that knowledge. Today's meeting is a major step toward filling that dangerous gap." *Dr. David Hamburg*

But in fact, the main lesson that emerged from the Conference is that parenthood is the art of the possible. Babies don't need "super parents" in order to thrive. Scientists stress that the people who care for children have a greater impact on early brain development than they previously thought. But they also say that ordinary, everyday interactions with infants and toddlers—the baby talk and songs and games that are so easy and enjoyable—are exactly what young children need.

"I hope this conference will get across the revolutionary idea that the activities that are the easiest, cheapest and most fun to do with your child are also the best for his or her development—singing, playing games, reading, storytelling, just talking and listening." *Hillary Rodham Clinton*

And while the early years offer special opportunities, parents, caregivers, and teachers have countless chances, over many years, to influence children's development and learning. The brain is the last organ in the body to mature, and its development takes a lifetime. It is never too late to help a child—or an adult—learn.

There are many ways to raise happy, healthy, capable children. The White House Conference provided a map, showing many ways to reach that destination. It shared success

stories. And it reassured parents that they need not make the journey alone. All sectors of our society can contribute to children's healthy development. In the final analysis, we are all accountable for their well-being. We must all answer to the children.

THE PUBLIC'S BUSINESS

"This unique conference is a part of our constant effort to give our children the opportunity to make the most of their God-given potential and to help their parents lead the way, and to remind everyone in America that this must always be part of the public's business because we all have a common interest in our children's future." *President Bill Clinton*

"This is the most important issue facing the future of our country." *Governor Bob Miller*

Considering the rigors of raising a child, it may seem remarkable that so many people want the job, especially in an age when men and women can decide whether and when to become parents. And yet, some four million babies are born in the United States each year. Our country has more than 67 million families with children under the age of eighteen. Adoption agencies across the nation have lengthy waiting lists of people longing to become parents. For most of us, the desire to nurture new life, to pass on our hopes and our history, is so compelling that thousands of diaper changes, countless hours of lost sleep, and a few decades of anxiety—not to mention considerable expense—are not enough to deter us.

Children make life precious today and possible tomorrow. They are our future. Ensuring that their families and communities have the resources they need to give them the best possible start in life is simply the right thing to do. It is also clearly in the national interest. What could be more crucial to our nation's continued vitality than children's well-being? Assuring their healthy development and learning must always be part of the public's business.

This has always been true—but never more urgently than today. In past times, our country flourished because we had such abundant natural resources and ready labor. If millions of Americans failed to reach their full capacities, it did not matter; our farms and factories could absorb millions of unskilled workers. But the world has changed. As we move into the 21st century, we find ourselves in a time when knowledge is a country's most valued asset, when a nation's prosperity and security hinge less on its physical resources or the size of its labor force than on the knowledge and skills of its people. Of course, if we make no special efforts to enhance children's development, the vast majority will still learn to walk and talk, to follow instructions and perform a range of useful tasks. But more and more jobs (as well as the everyday challenges of life) require conceptual prowess and creative problem-solving. We live in an era when we need the best thinking of all of our people. As a nation, we can no longer conduct ourselves like an airline, counting on a substantial number of no-shows.[2]

> "We have now finally put the issue of early childhood development front and center, where it belongs. It is the single most important issue facing America today." *Rob Reiner*

The need to develop our human capital has become a common theme of economists and business leaders, and a major concern of policymakers. Efforts have been launched, over the last two decades, to retrain workers and to reform schools, and these are important endeavors. But today, many Americans are concluding that we are relying far too much on remediation, and far too little on prevention. If we want all of our children to reach their God-given potential, we must begin at the beginning—at birth, or even earlier.

That means harnessing all of the knowledge and research available to us about how young children develop and learn. To make a difference, decision makers are—at some political risk— venturing into realms that have traditionally been demeaned as beneath serious consideration. They are tackling problems that have often been dismissed as "women's issues" and dropped to the bottom of the national agenda. Today, thanks in part to decades of productive brain research, policy makers are turning their attention, for stretches of time, from the floors of the House and Senate to the floors of living rooms and child care centers all over America where babies and toddlers play and babble and learn. Those are the floors where our nation's future is being determined.

II. What We Know About Young Children

Children differ from adults

It is natural to think of babies as ourselves in miniature—adults on a smaller scale. That is, after all, one of the things that makes young children so appealing and prompts even the most exhausted adults to respond to their demands. But the more we discover about young brains, the more clear it becomes that young children differ from adults in important ways. They have unique ways of developing, learning, and responding to the world around them. By taking these differences fully into account, parents and professionals can do a better job meeting young children's needs.

> "The baby's brain is not just a miniature version of an adult brain. It is a dynamic evolving structure that requires its own function to wire itself...." *Dr. Carla Shatz*

At birth, children's brains are in a surprisingly unfinished state. Newborns have all of the genetic coding required to guide their brain development. What's more, they have nearly all of the billions of brain cells, or neurons, they will need for a lifetime of thinking, communicating, and learning. But these neurons are not yet linked up into the networks needed for complex functioning. It is like having billions of telephones installed around the nation, but not yet connected to each other. [SIDEBAR: PHONING HOME]

The extreme immaturity of the newborn's brain is uniquely human. We tend to take it for

granted, but not every species gives birth to such undeveloped infants. At birth, the human brain is only a quarter of its adult weight; the newborns of other primates are already 40 or 50 percent of their adult weight. The young of other species are rarely as helpless as newborn humans; nor do they take as long to move toward independence.

This may sound worrisome, but in fact, our initial immaturity gives humans a powerful evolutionary edge. Monkeys and minks and mice are quite limited in terms of the kinds of settings in which they can survive. We humans have found ways to adapt to almost any habitat on earth. Why? In large part, because so much of our brain development takes place in the world—in contact with our environment. That crucial fact means that experience plays a far greater role in the wiring of our brains. Our developing nervous systems can be significantly altered and fine-tuned by experience. This makes humans uniquely flexible and adaptable. It also allows us to have far greater individuality than other species.[3] Different people's brains—even those of identical twins—will be wired very differently, based on their responses to different input.

The key point is that the preponderance of human brain development takes place in the world, as babies respond to the people who protect and nurture them, the homes that are created for them, and the communities and conditions that surround them. If babies' brains were completely hard-wired—if all of the circuitry were pre-programmed—this wouldn't be possible.

PRENATAL CARE MUST BEGIN EARLY

A young child's brain is a work in progress, and scientists are now able to watch it unfold. Thanks to new, computer-based imaging technologies, such as ultrasound, MRI, and PET scans, they can now see the brain's structures in greater detail than ever before. They can get a glimpse

of how the brain responds to different kinds of experience and how it uses energy. They can see how the brain looks and functions at different stages of development—including in the months before birth.

By applying new technologies, scientists have learned that brain development gets underway very soon after conception. In fact, they can see the rudiments of the nervous system in a seven-week old fetus. They have greater evidence that the prenatal period is a crucial time for brain development. During these nine months, the brain must produce billions of neurons. In fact, in the time it takes mom of dad to microwave a bag of popcorn, a fetus can gain a million new neurons. This is quite a feat—especially when one considers that these neurons have to be produced in exactly the right quantity, and have to find their way to exactly the right place at exactly the right time.

A great deal of brain development takes place late in pregnancy. For example, in the third trimester, the brain is actively beginning to form connections among neurons—a process that will proceed in earnest during the first three years of life. But even before birth, the brain is "in training" for the experiences it will encounter in the world. For example, vision is not yet functional in the womb, but even before birth the eyes of a fetus are running "test patterns" to get ready for the world.

In short, the prenatal period is an important time of brain development. Nature has powerful mechanisms to guide the process—including a great deal of genetic coding, and expectant parents can rest assured that in the vast majority of cases, development proceeds just as it should. But even in the womb, the brain is vulnerable to environmental influences. When pregnant women have inadequate nourishment, when they smoke, drink, or take drugs, or when

they are exposed to toxic substances, their babies' brain development may be jeopardized. Research also suggests that when they suffer abuse, or extreme stress, or severe depression, their babies are affected. That is why it is so important for expectant mothers to seek care as early as possible in their pregnancies. That's not why --

In fact, the ideal situation is for prospective parents to receive information and support even before they conceive a child. This is sometimes called "preconception care" and it can boost the health of mothers and babies, as well as fathers' knowledge and confidence. Preconception care makes sense because crucial steps in early brain development take place very early in pregnancy, before many women know that they are expecting. For example, within weeks of conception, cells that are destined to become neurons have to find their way to the correct position in the developing cortex—the part of the brain that plays a crucial role in thinking and learning. They have to do it at the right time, in the right order. Poor nutrition or exposure to harmful substances may be even more risky in the third week of pregnancy than in the tenth of twelfth, when many parents head for their first prenatal visits.

AFTER BIRTH, BRAIN DEVELOPMENT PROCEEDS AT A STARTLING RATE

> "On the first day of life, a baby can search the room with her eyes, visually trace the edges of a triangle. and look intently at her mother's eyes during a feeding." *Dr. Donald Cohen*

Newborns are relatively helpless. They cannot walk or talk or reason. And so, adults have tended to think of them as mindless—empty vessels waiting to be filled. But because the

brain has been "in training" before birth, newborns have more awareness of the world than most of us realized. On the first day of life, a newborn can look at her surroundings, study objects, and gaze in the eyes of her mother or father. Infants as young as two days of age will sometimes suck at the mere sight of a bottle, suggesting that learning takes place from a child's earliest hours of life.[4] But the process of getting to know the world is just beginning. At birth, a newborn cannot yet make sense of the flood of sensation and information that comes his way.

After birth, brain development proceeds at an astonishing rate. The first three years are particularly crucial. Children's brains are literally waiting for the experiences that will determine their complex circuitry. As new experiences arrive, young children's brains respond by forming and reinforcing trillions of connections, or synapses, among neurons. In the time that it takes for Mom to nurse the baby or for grandpa to read *Goodnight Moon* , thousands of new synapses are produced. At the same time, thousands of existing synapses are used or "fired." Each time a synapse is fired, it gets stronger.

Connections are made so quickly that by the time children are three, their brains have twice as many synapses as they will need as adults. These trillions of synapses are competing for space in a brain that is still a fraction of its adult size. This makes children's brains extremely dense compared with those of adults. By the age of three, children's brains are also more than twice as active as the brains of their ~~President —or members of Congress.~~ too cute

If children have more synapses than adults, what happens to the trillions of excess connections? The answer is: they are shed as children grow. Scientists report that throughout the development process, the brain is both producing new synapses and getting rid of those that aren't used often enough. Before the age of three, synapse production is by far the dominant process;

from three to ten, the processes are relatively balanced, so the number of synapses stays about the same. But as children near adolescence, the balance shifts, and the shedding of excess neurons moves into high gear.

Brains downsize for the same reason so many other "organizations" do: with streamlined networks, they can function more efficiently. But how does the brain "know" which connections to shed and which to keep? Here again, early experience plays a decisive role. As we said earlier, each time synapses fire, beginning with the early months and years of life, they get sturdier and more resilient. Those that are used often enough tend to survive; those that are not used often enough are history. In this way, a child's experiences in the first years of life affect her brain's permanent circuitry.

"SMALL TALK" HAS BIG CONSEQUENCES

> "By six months of age, infants are well on their way to cracking the language code." *Dr. Patricia Kuhl*

Early experience has an especially strong impact on language development. Over the last quarter century, scientists have learned a great deal about how children acquire language. Parents have long suspected that babies' babbling is basic training for speech, and that their gestures and cries eventually evolve into more sophisticated forms of communication. But new research shows that infants make more rapid progress in cracking the language code than we previously thought. From their early months, they are paying close attention to the language they hear.[5] By the time

they are a year old, they are well on their way to mapping the sound structure of their language—or, in multilingual homes, to the language they hear most consistently. **[SIDEBAR: CITIZENS OF THE WORLD]** Adults have special ways of talking to children that help them analyze language. Young children also learn very quickly that relating to others is about taking turns. In this sense, many kinds of early interactions—even a game of peekaboo or mimicry of a baby's faces—can lay the groundwork for effective communication later in life.

Many kinds of experiences affect early brain development—all of the sounds and textures that surround them. But recently scientists have been homing in on linguistic experience as a key ingredient. More precisely, they are stressing the importance of "small talk"—the millions of ordinary greetings, exclamations, explanations, complaints, and wordless utterances exchanged between adults and children in the course of the early years.

> "When mothers and fathers talk to children, they raise their pitch and slow down their communication. The slowed-down communication says, "God ahead and take your turn. I'm addressing you. It's your turn now." *Dr. Patricia Kuhl*

But many parents do not begin talking to their children until their children are old enough to begin talking back. They may risk teasing or feel self-conscious when they talk to an infant who cannot respond; they may have grown up in cultures that value silence or non-verbal communication; or they may have few positive models of conversation between parents and infants. Some parents may be too tired, stressed, or demoralized to engage in lighthearted chat with their babies.

One recent study suggests that children's exposure to language is linked to their parents' income and education. For a period of two-and-a-half years, beginning with birth, the researchers spent an hour each month documenting every spoken word and every parent-child interaction in each of 42 homes. They found that the more parents talk to and interact with their babies, the greater the children's chances for success when they reached elementary school. They concluded that both the number of words exchanged and the tone in which they were said made a difference. All of the children learned to use language and construct complex sentences, but the children were talked to at a younger age had a stronger grasp of the conceptual possibilities of language, and were better problem solvers.[6]

The idea of keeping up a steady flow of conversation may sound exhausting. But babies appear to benefit from exactly the kinds of commentary that run through parents' minds as they move through their day. In the study mentioned above, the patter that went on between the chatty parents and their infants was not about Buddhism or Beethoven—or, for that matter, brain science. You need not discuss complex ideas to help your baby learn. But a stream of statements like, "Your bottle is almost warm," or "This key is sticking in the lock," appears to help babies become more conceptual thinkers later in life. Simple questions like, "How was your nap?" or "What did we do today?" appear to make a world of difference.

> "As researchers, we don't advise parents to try and accelerate the normal pattern of development. We don't recommend flash cards to try to teach words to three-monthers. Nature has provided a perfect fit between the parents' desire to communicate with the child and the child's ability to soak this information up." *Dr. Patricia Kuhl*

PARENTS AND OTHER CAREGIVERS INFLUENCE BRAIN DEVELOPMENT

All of this research points to the fact that parents and other caregivers play an even more important role in early brain development than scientists previously suspected. The experiences they provide or arrange help to determine how their young children's brains will be wired.

This finding certainly validates the importance of people who care for babies. And that is good news...or is it? This is where parents and caregivers begin to get nervous. They may wonder: Did I say enough words to Jake when he was a baby? How many connections formed—or failed to form—during the ten minutes Emmy was left to cry so Robert's bee sting could be tended to? What about all the times the neighbor lost his temper and shouted at Rebecca? Has musical potential been wiped from Melissa's brain because we never played Mozart or Bach?

The answer is: you don't have to be a perfect parent. Researchers are confirming a bit of wisdom that was articulated decades ago—you just have to be good enough.[7] And good enough means: Able to understand your children's needs and to read their signals— most of the time; able to respond with warmth and affection—most of the time; able to model the pleasures of conversation and turn-taking—most of the time; able to protect your child from life's minor bumps and bruises—some of the time; determined to shield the children from neglect and abuse---all of the time.

To be sure, parents have considerable (but not total) control over the kinds of experiences their children are exposed to. But what kind of experiences do infants and toddlers need? Research offers a clear answer. Linguistic experience is important, but more than anything else,

young children need secure attachments to the adults who care for them. Long-term studies show that children who have secure attachments early in life make better social adjustments as they grow up, and do better in school. Young children need a wide variety of experiences that spark their curiosity and tap all of their senses, but helping mom or dad unpack a bag of groceries can be as "enriching" as a visit to the art museum.

The key point is: relationships matter. Social experience has a greater impact on early brain development than scientists previously realized. Children learn in the context of important relationships: interactions with parents, grandparents, brothers and sisters, and other family members. Biology is not the chief factor in good parenthood: adoptive parents and foster parents can have a large, sustained impact on children's development. So can grandparents. So can child care providers who are steady presences in children's lives. And so can family friends and neighbors. Again, while opportunities are especially strong in the early years, important relationships make a difference for children at any age.

"Adoptive parents can make an enormous difference for a child at any time." *Hillary Rodham Clinton*

Better mate?

To be sure, children need stimulation. Children who spend most of their first year of life lying in their cribs develop much slower than other babies; some cannot sit up at 21 months, and most cannot walk by age three.[8] Children need touch, sounds, and images. They need social and emotional contact. They need thought-provoking activities. Despite parents' best intentions, many infants and toddlers do not get enough intellectual stimulation. Only half are read to on a regular

basis by their parents, and many mothers and fathers do not engage in other activities that encourage their children's intellectual growth.[9]

"An infant's cognitive growth occurs through emotional and social interactions." *Dr. Harriet Meyer.*

On the other hand, too much stimulation can be overwhelming. Children have different temperaments and different moods. They also have different daily cycles of wakefulness and sleepiness than adults. Aside from seeing to their children's basic health and safety, the most important thing parents can do is to learn to follow their children—to read their moods and preferences, so they can—whenever possible— adjust activities, schedules, and even the way they touch and talk to their young children.

To be sure, parents bear the greatest burden of responsibility for their children's development and learning. But mothers and fathers cannot and should not be held responsible for every hurdle their children encounter, or for every problem they may face. Many factors shape brain development, including social, economic and environmental conditions over which individual parents have little control, and including their child's genetic make-up.

From birth, children appear to have different temperamental characteristics. Certainly, a baby's temperament may reflect his prenatal experience, but it often appears to be innate. Research suggests that most infants and toddlers have traits that make them "easy" children; but a significant number—about ten percent—have difficult temperaments. They tend to be moody, to express

intense emotion, and to resist efforts to comfort them or cheer them up.[10]

Furthermore, some children are born with, or develop, disabilities or illnesses that affect their ability to form strong relationships and to respond to different kinds of stimulation. Some children are born with severe retardation, or autism, or mental illness. Others may have learning disabilities that do not fully respond to current treatment methods. Research points to new ways to help every child reach his or her full capacities. Working with professionals, parents can now help children with many kinds of disabilities gain new skills and new confidence. New ways of approaching impairments like mental retardation or autism are helping to improve conditions that were once considered untreatable. But some children will continue to have difficulties no matter how much love, care, attention, and stimulation their mothers and fathers provide. Professionals and parents alike must resist shifting their focus from brain development to blame development.

PREVENTION IS CRUCIAL

The brain does not develop all at once. Different parts of this complicated organ mature at different times and at different rates. Although development continues throughout life, there are periods of great opportunity (and risk) when a particular part of the brain is the site of intensive wiring and is therefore especially flexible.

The classic example is vision. The visual part of the brain is wired early in life. If children are born with cataracts, they may lose their sight permanently if surgery is not performed on time. That is because during the period when the visual cortex is developing, input from the outside world is essential. Without this critical experience, the part of the brain that controls vision cannot

fully develop. Time is of the essence. In contrast, when adults develop cataracts, the consequences of delaying surgery are far less drastic.

This holds true for other aspects of development as well. Untreated health problems, poor nutrition, exposure to tobacco, alcohol, drugs, or environmental toxins, and abuse and neglect are always risky, but may be especially perilous in the first years of life. Traumatic experiences and non-stop stress are also particularly harmful early in life; they affect production of a steroid hormone called cortisol that can adversely affect brain development. Finally, when mothers suffer from severe depression that persists beyond the baby's sixth month, children's brain development may be affected.

That is why prevention and early intervention are so crucial. When health problems are dealt with, when family stress is reduced, when mothers' depression is treated, young children tend to fare better. The earlier the intervention, the better. The more follow-up, the better. These are simple lessons. As they are applied more widely, results for young children are bound to improve.

FINALLY, WE KNOW THAT WE NEED TO KNOW MORE

> "Scientists have discovered much about the world that surrounds us, but the train inside our skulls remains a source of mystery and wonder, and is, in a sense, the next frontier of human understanding." *Vice President Al Gore*

Decades of research have led to breathtaking discoveries about early brain development,

but much remains to be known. What kinds of stimulation do children need? How much? And when? How does stress affect young children, and how can its impact be blunted? How can the quality of child care be improved? What kinds of education and training can help parents and other caregivers enhance children's development? How can communities mobilize in order to contribute to children's healthy development? How can different kinds of developmental delays and impairments be overcome? Why do so many children appear to be at risk for Attention-Deficit and Hyperactivity Disorder, and how can they be helped? We need more research.

↓

Statement, rather than ?

Not really the right title - this chapter is about babies in their world

III. What Young Children Know About Us

"No matter how young, a child does understand a gentle touch or a smile or a loving voice. Babies understand more than we have understood about them. Now we can begin to close the gap...." *President Bill Clinton*

First 2 sections are really the same - imp. of appropriate communication

Parents are the most important people in their world

Babies discover very quickly that they are not alone. From birth, they are capable of observing and interacting with other people. Babies grasp that the world we've brought them into is a fascinating place. When they are awake and alert, they lose no time exploring their surroundings with all of their senses. But nothing is more interesting or important to them than their mothers and fathers. Very early in life, babies turn most eagerly toward the voices of the people they know best.

Babies respond to touch, sound, images, tastes, smells. They are at ease when they receive warm, responsive care geared to their needs, moods, and temperament. [SIDEBAR: READING CHILDREN'S SIGNALS] On the other hand, they experience tension when care is inadequate, or mechanical, or inconsistent—and research shows that this stress affects their heart rate, brain waves, and their brains' biochemistry.

Not related to parents

"The reason we talk to babies in a special way is that they know we're talking to them. If

I hold up a newborn with his head away from me and say, *Hi, how are you doing? Come on, you can turn to my voice*, that newborn...turns to my voice and arches toward me as if to say, *There you are!*" *Dr. T. Berry Brazelton*

THEY KNOW THAT WE ARE UP TO THE JOB

Human children are dependent—to a greater extent and for a longer stretch of time than the young of other species. They are also trusting. They turn to parents and other caregivers for reassurance or help. They believe that we will nurture and protect them, unless repeated experience teaches them otherwise.

They know that interacting with parents and other important people—communicating, mimicking, playing, snuggling—is the best way to spend their most alert, wakeful hours. When they are allowed to form secure attachments, they know that they are loved even during quiet or sleepy times, when they are left to rest, play by themselves, get to know themselves, and look around them.

THEY KNOW THAT OTHER CAREGIVERS CAN MEET THEIR NEEDS—BUT DON'T TAKE THE PLACE OF MOM AND DAD.

Research shows that children are capable of forming strong attachments to more than one adult, but not all attachments are equally strong or compelling. Babies tend to prefer their primary

caregiver—usually mom. But they quickly learn that other people can meet their needs, and that different people—dad, or Uncle Mike, or grandma, or Mrs.Swann—have different ways of caring for them. In this way, they begin to get a sense of life's complexity and richness.

"Children with active fathers develop a richer set of emotions and a wider, more textured view of their world." *Vice President Al Gore*

Child care providers can be important people in young children's lives, but do not take the place of parents. Recent studies show that high quality child care does not disrupt children's attachments to their parents—so long as parents spend enough time with their infants and toddlers to know them well, care for them confidently, and read their signals and cues. **[SIDEBAR: CHILD CARE AND THE FAMILY.]**

"If you can place your child in high quality child care, you can actually supplement what you're giving them as parents and that's why the value of making high quality child care affordable for more families is so great." *Dr. Deborah Phillips*

In fact, child care providers—with sufficient training and support—can enhance the development of the children in their care, supplementing the parents' input. This is especially true when parents and child care providers work together, exchanging information, insights, and problem solving strategies on a regular basis.

CHILDREN KNOW THAT THEY HAVE TO BE PATIENT WITH US.

Unconditional love goes to the heart of what it means to be a parent. But love is not enough. Good care is responsive care. It requires getting to know a particular child very well, and that is not simply a matter of instinct or affection. Parents and caregivers don't always get it right the first time, or even the second, but if they are willing to follow the children, if they are willing to learn from their mistakes, they eventually come to understand their needs and temperaments.

Mistakes are inevitable. As the lullaby promises, the cradle will rock. A baby who is full will be coaxed to eat. A toddler will be tossed into the air by an enthusiastic dad when what he really needs is a cuddle and a nap. And parents will frequently realize, after the fact, that they could have found a better way to handle a problem. No parent gets it right every time. One expert on child development has said that when she makes a mistake with her own children, she vows not to repeat that particular mistake...for at least two weeks.

Of course, some mistakes cannot be tolerated. There is never an excuse for abuse or neglect, or for household dangers that imperil children's lives. But young children will inevitably miss a meal, scrape their knees, or overhear their parents argue. They can easily survive the ordinary ups and downs of daily life, as long as the care they receive day by day is usually warm, responsive and consistent. In fact, these ups and downs are among the experiences that help their brains to mature. What's more, when children have a secure attachment to the adults who care for they, they are indulgent. They know that we deserve many more chances.

IV. We Know What Works

Researchers and policy makers still have a great deal to learn about how children grow and learn, but we know enough to begin now to promote their healthy development. Research and practice in many fields—including not only brain science but also medicine, psychology, education, cognitive science, and organizational development—have produced an immense body of knowledge, leading to better, more informed, approaches to helping young children and their families. This knowledge rests on thousands of studies and evaluations of hundreds of programs—far too many to summarize in a single report. But we can distill from them fundamental lessons about effective strategies.

Preventive, family-oriented health care works

We Americans take pride in having created a truly advanced society. In the realm of science and technology, we have few rivals. People from around the globe seek information and treatment from our health professionals. Given our resources and the value we place on life, liberty, and the pursuit of happiness, we should have the world's lowest rate of infant mortality. And we do—but only in our more affluent communities. When the nation is considered as a whole, we lag behind more than a dozen other countries in ensuring infant survival. Among African American women, infant mortality is twice as high as it is for white women. The United States also ranks below many other countries in immunization rates and health coverage for pregnant women and children. Compared to other countries, we have a high proportion of low birthweight babies.

Can't say this

We can do better—if we take a preventive approach to health care and make adequate prenatal care available to more expectant mothers. The facts are clear: good prenatal care dramatically boosts women's chances of giving birth to a healthy babies. It is also a sound investment. For example, prenatal care reduces the number of low-birthweight infants; every time it does, the nation's health care system saves up to $30,000.[11]

> "Too many women in this country still do not get adequate prenatal care because of lack of knowledge, motivation, resources, or insurance, and we must work to reduce these barriers." *Dr. Ezra Davidson*

Prenatal care also lead to better nutrition for expectant mothers and infants—a critical factor in children's healthy development. The government provides critical nutritional support by means of the WIC program, which provides nutrition to pregnant women and infants, and food stamps for low-income families. But expectant parents need information and guidance about the kinds of foods and food supplements needed for good health.

Ideally, maternal health care and parent education begin before conception. It is unquestionably important in the early months of pregnancy. And yet, many women still do not get adequate prenatal care. About one in five expectant mothers in our country receives no care during the crucial first trimester. For African American, Latina, and American Indian women, the figure is one in three. Some lack health care coverage that would pay for early visits. Others don't know where to go, or how to get there, or why a doctor would want to see them when they are not even "showing." Efforts are needed to ensure that the public is better informed, that prenatal care is accessible and affordable, and that care is not delayed while eligibility is established. Aggressive

outreach is needed to encourage more prospective parents to seek early care. And preconception and prenatal care should encompass not only health care and risk assessments, but also solid information and services such as screening and treatment for depression, smoking cessation, and treatment for alcohol abuse. While maternal health is the main focus of prenatal care, children benefit when fathers are brought into the process from the outset.

Prenatal care is a good start—but only a start—for a lifetime of good health. Infants and toddlers need regular well-child care, the full set of recommended immunizations, and swift attention when they show signs of illness or developmental delays. That is why health coverage is so important, but today, ten million children (including 2.2 million children under the age of three) are without coverage. Most of these children have parents who hold down jobs but have no employer coverage and earn too little to purchase their own policies. Health care is especially important for the nearly 3 million infants and toddlers living in a family with an income below the federal poverty level. ~~children living in low-income families,~~ since these children are at significantly higher risk for infant mortality, low birthweight, physical or mental disabilities, fatal accidents, and common health problems such as asthma, frequent diarrhea, pneumonia, or dental problems. The President's balanced budget plan will extend coverage to an additional five million children by the year 2000, but more must be done to protect the health of the millions of children who will remain uninsured.

Can we use this?

Once parents have access to health care for their children, it must be family-centered. Many parents want more information, reassurance, and resources during well-baby visits than traditional pediatric practices can provide. When health care providers (and insurers) restructure their policies and practices to provide services that meet parents' needs and emphasize prevention, children benefit. A new program called Healthy Steps has recently been launched at sites across the nation

to model comprehensive, preventive, family-centered pediatric care.

As Americans intensify efforts to improve health care for young children and their families, we can learn from the experiences of other countries, including both industrialized and developing nations. Immunization is a good example. Recently, the Mayor of Baltimore travelled to Africa to learn how campaigns to promote immunization rates have been planned and implemented. The ideas he brought back, including mobile van services, have begun to make a difference for the city's young children.[12]

FAMILY SUPPORT AND PARENT EDUCATION WORK—ESPECIALLY WHEN THERE IS FOLLOW-UP.

Writing about the importance of parent education, an American physician asserted that parents too often undertake their new roles "without previous instruction, or without forethought; they undertake it as though it could be learned either by intuition, by instinct, or by affection. The consequence is, that frequently they are in a sea of trouble and uncertainty, tossing about without experience or compass."[13]

This statement was written nearly a century ago by one of our nation's early women physicians, and despite the fact that we have advanced light years in terms of the medical and scientific knowledge, the need for family support and parent education remains as strong as ever. Perhaps stronger—since today Americans are far more mobile, and are less able to count on advice and help from extended family living in their households or around the block.

Raising children is challenging for all parents; it is certainly stressful for the nation's large

number of very young parents. Recently, the birthrate for adolescents has decreased slightly, although the problem remains serious. Each year teenage mothers give birth to nearly half a million babies. Today, 3.3 million children live with adolescent mothers. These young mothers have a particular need for parent education and support. They are much less likely than other mothers to take advantage of prenatal care, and those who are 16 or younger are more likely to have low-birthweight children—with all of the health and developmental problems associated with that condition. In general, children born to teenage parents, especially those living with their mothers alone, appear to be more likely than other children to have continuing health problems.[14]

But all parents can benefit from family support and parent education. Parents want more information. Most say they have a pretty good idea what to look for in terms of their babies' physical development, but need more help recognizing social and emotional milestones. They are perplexed by recent findings about the importance of the early years. They know they need to stimulate their children, but how? and how much? And how can they be sure that the other adults who care for their children will give them what they need?

Family support and parent education programs are often aimed at new mothers, but can also help fathers adapt successfully to their new roles. The best programs address not only childrearing issues, but the challenges parents are meeting as they raise their families, such as getting and keeping jobs, resolving conflict, and managing their time.

A number of well established family support programs have been subjected to rigorous evaluation. For example, an evaluation of Avance, a family support program that has served Mexican American families over two decades, has demonstrated clear, long-lasting benefits for participants and their children. In general, research evidence on comprehensive family support

programs is promising but not conclusive. Comprehensive, multifaceted programs are difficult to evaluate because they encompass so many activities, and tailor services to the needs of different families. Different programs serve children of different ages and target different kinds of families, so it is hard to make comparisons of their impact or cost-effectiveness.

It is known, however, that programs that stress home visitation parent education can produce impressive results, particularly when they begin with prenatal care and include follow-up into the elementary school years. Programs that include regular home visits appear to be particularly effective in meeting new parents' informational needs and allaying their anxieties. **[SEE SIDEBAR: THERE'S NO PLACE LIKE HOME.]** Twenty-five years ago, when hospital stays for new mothers were twice as long, there was more time for advice and instruction—and new parents have a lot to learn. Nursing an infant is certainly a natural process, but the know-how to begin successfully does not come naturally. The same is true for diapering or bathing a newborn, or dealing with cradle cap, or establishing daily (and nightly) routines. Even a hospital stay of 48 hours—now guaranteed by law—is not always enough time for parents to adjust to their new responsibilities before they bring their newborns home. Follow-up is helpful, but today, only one in five families receive follow-up visits by nurses. As the months pass, most parents gain confidence and competence, but they can still benefit from advice about how to keep track of a baby's development, how to recognize and deal with illnesses and emergencies, how to baby-proof their homes, choose toys for their children, and play and chat with children at different ages. Some home visitors make videotapes. These tapes help parents learn what to look for as they watch their children grow, and can spur important discussions of children's development in the context of family dynamics.

"The most important assessment tool that we have is our power of

observation....Dr. Sally Province, the great pioneer of infant development, said: *Don't just do something, stand there.* She meant that observing how a parent and child interact is critical to understanding how to reach out and to help them. Sometimes, we need to leave the parent and the child alone." *Dr. Harriet Meyer*

HIGH QUALITY CHILD CARE AND EDUCATION WORK

Today, most mothers with infants under the age of one work outside of the home. Many choose to continue their careers while raising a family; others might prefer to stay home, but have no choice. Today, 55 percent of working women are indispensable providers, contributing half or more of family income.[15] Other women must work or attend training to meet new welfare requirements.

As a result, the great majority of infants and toddlers—80 percent—are in non-maternal care for some stretch of time. This is a potential opportunity. Studies that have followed children's progress over decades, such as the Perry/High Scope Preschool Study, have shown that high quality early care and education programs produce long-term benefits, especially for children from low-income families. Programs with well trained staffs and strong curricula (geared to children's needs at each stage of development) have been shown to promote cognitive, social, and emotional development in young children. Children who attend such programs fare better in elementary school, especially if there receive ongoing support as they move through the grades. They are less likely to be held back and less likely to be referred for special education. Some effects have been shown to persist into adulthood.[16]

The trouble is—high quality, affordable child care is hard to come by. Researchers who have observed and rated child care programs (including both child care centers and family day care settings) say that most are poor to barely adequate. Programs for infants and toddlers appear to be the worst of all.[17] Moreover, child care schedules often do not mesh with parents' work schedules. Many parents resort to makeshift arrangements; their children may be in several locations or programs during the course of a single day.

Researchers and practitioners have come up with many proposals to address the quality crisis in early care and education. Some take a broad view, arguing that changes must be made not only in programs, but also in the policies, financing strategies, and accreditation practices that underlie the nation's child care services.[18] There efforts provide a broad framework for improving child care so that children can thrive and parents can work and learn with peace of mind.

The Pres. directed . . .

We can base tomorrow's early care and education programs on the experience of today's successful programs. For example, much can be learned from the experience of the military, which has instituted excellent child care programs by requiring substantial basic training for caregivers, offering them a career ladder, and providing sufficient wages and benefits to reduce staff turnover. **[SIDEBAR: ON THE LAND, IN THE AIR, ON THE SEA...AND IN THE SANDBOX.]**

Education not really addressed. What about POTUS inimatives here

A COMPREHENSIVE APPROACH WORKS

Finally, to meet the many needs of our youngest children, we need a comprehensive approach. This is the toughest challenge of all. In part, it is difficult because Americans tend to

resist "systems." When it comes to young children, however, we pay systematically when we provide piecemeal services that let so much promise slip through the cracks.

Years of Promise, the report of the Carnegie Task Force on Learning in the Primary Grades, urged a comprehensive approach to meeting children's needs. It argued that, "In this time of profound social and economic transition, no single institution can realistically be held fully responsible for ensuring the education of children as they move from early childhood to early adolescence." It called upon "each major institution that contributes to children's learning—families in the context of communities, preschools, elementary schools, and the media—to align their efforts more consistently with...common principles of effective practice."[19]

Years of Promise outlined a set of principles that all front-line institutions in children's lives, beginning with families, can begin to incorporate into their practices and policies: The following guidelines are adapted from that list.

shouldn't this be more related to the conference?

- **Ensure, from the start, that children are ready to learn, physically and emotionally.** Protect the health of expectant mothers. Work to see that children are safe, healthy, well-nourished, and free from debilitating anxiety.

- **Help children build stable, trusting relationships with adults.** They can create secure, stable, predictable environments in which every child is known well by at least one adult.

- **Support the adults who influence development and learning.** Provide ongoing education and support for all adults, beginning with parents, who influence children's

development and learning.

- **Focus on prevention, and respond quickly when problems arise.** They can observe every child's progress on a continuing basis, so that when problems occur, intervention is immediate.

- **Set high expectations:** Set and communicate high expectations for every child, including children with special needs.

- **Offer varied, engaging, effective, appropriate learning activities.** Provide a range of challenging learning opportunities, reflecting the fact that different children learn in different ways. These activities should be based on the best available knowledge of child development and brain development.

- **Make efficient, equitable use of resources.** Deploy resources fairly and efficiently, based on the premise that different children will need different levels of time and resources to achieve adequate results. Programs or practices that do not prove to be effective in helping children develop and learn should be discontinued.

- **Collaborate with other institutions.** Make conscious, sustained efforts to link with other institutions, agencies, or programs that affect children development and learning, or have potential for doing so.

- **Take responsibility for results.** Monitor and document children's progress toward developmental milestones, analyze the factors that promote or hinder healthy development

and learning, and make the changes needed to improve results for all children.

If all of the core institutions discussed in the following chapter were to apply these principles across the board, and take steps to coordinate their approaches, the nation would achieve far better results for young children and their families.

Don't like this message -- the next chapter is about what is right.

Still finishing this section — coming soon

V. Building on Success

Next steps

The accomplishments of recent years can be solidified and extended. No endeavor promises more long-term benefits for our nation than giving children a better start in life—but no endeavor is more difficult. Parents must take the lead. But this effort challenges many people and many institutions to examine their policies and practices, and to make necessary changes. It means reordering priorities. This is not easy. Nor can it be done quickly. It will take sustained attention and work.

WORKING TOGETHER

Every sector of our society can make a vital contribution.

- What parents and families can do.

"The breathtaking discoveries in neuroscience yield simple, practical advice. Read to your kids. Talk to your kids. Sing to your kids. Dance with your kids." *Vice President Al Gore*

"One of the things I learned [by taking part in the Early Childhood PTA] is that there is always opportunity to take advantage of a teachable moment. You don't

have to take your child out to a "fun fair." You can begin at home. You can begin in your kitchen. You can go right outside your back door." *Sheila Amaning*

Take advantage of "teachable moments" — including highly charged moments

- What community organizations and agencies can do

"Since police officers are the last of a dying breed of professionals who make house calls 24 hours a day, seven days a week, we are in a position to direct people to the resources best suited for their particular problem. This new approach—community policing—requires a new type of police officer, with special training and special partners." *Chief Melvin Wearing*

- What educational leaders can do

- What business leaders can do

"We looked at research conducted in Michigan which concluded that factors outside of the school are four times more important in determining a student's success on standardized tests than are factors within the school.... This reaffirmed for those of us in business that we cannot just sit on the sidelines and criticize. We must be involved." *Arnold Langbo, CEO, Kellogg Corporation*

- What the media can do.

"There are people in this room who have been wrestling with these problems for 15, 20, 25 years, and we have the solutions. My job is to take this information and disseminate it to the public, because we have to create a public will. Once we create a public will, there will be a wave that is inescapable." *Rob Reiner*

- What government can do - not take over parents' roles, but make sure that parents have a range of choices about how to raise and care for their young children, as well as the tools and information that can help them make sound decisions.

"Our challenge as elected officials is to work together at all levels of government. The federal government can and should have a role....State governments should have a role, not just in working with the federal government, but on their own. We're putting several million dollars into the family concept that I've put forth in the State of Nevada. And I think more can and should be invested in future years. We should also coordinate with local government." *Governor Bob Miller*

VI. How Are the Children?

"A civilization flourishes when people plant trees under whose shade they will never sit."[20] This Greek proverb—thousands of years old—poses the challenge that faces us today. Are we willing, as a society, to invest in our children, even if those investments may not pay off fully for a decade or more? Are we willing, moreover, to invest in other people's children?

It has often been said that to gauge a nation's well-being, the first question one should ask is: "How are the children?" Today, we must respond to this question with a mixed report. But if we act now—if we look at the research, if we build on success, if we root out programs and practices that do not work, if we consider the impact on young children before making any new policy or program—we can make a difference. And if we do, imagine the answer today's infants and toddlers will be able to give when they are asked, in coming decades, "How are the children?"

Last page: Gabriella Mistral poem

Kansas City ?

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SIDEBAR 1

HOW ARE THE CHILDREN?

Most of our nation's young children are healthy, energetic, and look forward to bright futures. You can see them building castles in sandboxes, donning paper crowns in fast food restaurants, scanning the universe from their strollers. Many—though not enough—are achieving well in school and taking active part in the lives of their communities.

But too many young children are running into hurdles that impede or delay their development. Too many have parents who want to do right by their children but lack the resources or information they need to meet their many needs. And too many children are entering school without the cognitive, social, and emotional capacities they need to succeed in the kindergartens that await them.

Here are some recent statistics:

- One in five expectant mothers receives no prenatal care in the crucial first trimester. For African American, Latina, and American Indian women, the figure is one in three.
- Ten million children lack health insurance coverage—including 2.2 million children under the age of three.
- Despite recent improvement in immunization rates, more than a million children have not received their full complement of recommended shots by the age of two.
- Most young children who are enrolled in child care attend programs that have been judged, on the basis of observation by professionals, to be of mediocre to poor quality.
- Approximately one in three children is considered by their teachers to lack important readiness skills when they enter kindergarten.
- Forty percent of our children cannot read well on their own by the time they finish the third grade.

SIDEBAR 2

PHONING HOME

You might think of a brain cell as something like a telephone—although unlike a phone, it communicates with other brain cells by a combination of chemical and electrical signalling.

Now, like a phone, each brain cell connects with other brain cells—anywhere from one to ten thousand of them. So when you make a connection, one phone may ring, or ten thousand may ring. In all, the brain has to create a network of more than a hundred trillion connections; what's more, the hook-ups have to be very precise so that when you phone home, you reach your house and not a wrong number.

This is a daunting task considering that at the outset, nothing is connected to anything else in the brain. It takes a two-step process.

First, you need trunk lines—the gross wiring. You have to string telephone wires from one city to another, so when you place a call from Kansas City to Washington, DC, you don't reach San Diego. In terms of brain development, this means that the neural connections from the eye have to grow to the visual part of the brain. Connections from the ear have to grow to the auditory part of the brain. And so on.

But the problem of wiring isn't over. Once the trunk lines are in place, you still have to make sure that your call goes to the right address in Washington, DC, so when your grandmother calls you up in Washington, your phone rings and not the phone at the White House.

This is not a trivial problem. Let's take the connections from the eye to the brain. There are about a million connections from each eye, and there are about two million possible destinations that each one of these connections could reach. And yet fewer than 100 connections are selected from this vast number of addresses—and that's just the visual system.

So what is the solution? One possibility is that the brain could be wired like a computer. You could build the machine, program all of the connections, push a button, and pray that the right phone rings in the right city. In other words, the brain could rely on genetic coding for the entire process. But imagine how much coding it would take to program trillions of connections.

Nature's solution is much more adaptive and economical. In the process of development, the gross wiring is pre-programmed primarily by means of genetic coding. And then midway through the process, before all the wiring is complete, it's as if a switch is flipped and the newly functioning brain takes over the wiring process.

In this way, wiring the brain is a two-phase process. In the first phase, an infant's brain sends signals in the right general direction. It reaches the right city; but when it tries to phone home, there is ringing all over town.

But then, in the second phase, the brain takes over. It places trillions of phone calls, using them to correct initial errors in address selection. In a sense, the brain is running test patterns to figure out which are the most efficient connections. The wrong numbers are eliminated, and the right ones are reinforced and proliferate like mad.

So the baby's brain is not just a miniature version of an adult brain. It is a dynamic evolving structure that uses experience to form efficient neural networks.

Adapted from the presentation of Dr. Carla Shatz

SIDEBAR 3

CITIZENS OF THE WORLD

Over the past 25 years, we've learned a tremendous amount about the child's acquisition of language. The new research shows that in the first year of life, infants are mapping the sound structure of language. In fact, by six months of age, they are well on their way to cracking the language code.

It takes both nature and nurture—or, to say it another way, both biology and culture—to bring this about. Newborns are very well prepared to acquire language. At birth, infants across the world can discriminate all of the sound contrasts that are used in any language of the world. I like to refer to them as citizens of the world. They don't know which language they are going to have to acquire, so they are prepared for anything. This is quite a feat because the acoustic events they have to pay attention to are very, very minute.

Over time, infants have to change from citizens of the world to culture-bound language specialists. There is now evidence that by 12 months of age, they are well on their way to mapping the sound structure of their particular language. We know this because we have been doing studies in all over the world, observing babies as they listen to different languages.

In Stockholm and Seattle, for example, we observed that by six months of age, babies are already focusing on the particular language sounds that their language uses contrastively, rather than the sounds of all languages. We have just learned, from studies in Japan, that infants who at six months of age were able to hear the distinction between R and L no longer do so at 12 months. In other words, by the time they reach their first birthdays, babies have begun to ignore the variations that are not essential to their language and to pay attention only to that set of sounds that are critical for distinguishing words in their particular language.

What this research shows is that by six months of age, infants' perceptual systems have been altered simply by listening to us speech.

Now, six-mothers are very little babies. They have yet to produce a single word; the have yet to understand a single word, and yet the lesson from the research is that they are listening to us speak and their brains are busy coding the sound structure of the language they are going to have to master in order to be able to talk back. So the language we produce to infants is vital to them, and that puts a great deal of responsibility on us.

Adapted from the presentation by Dr. Patricia Kuhl

SIDEBAR 4

READING CHILDREN'S SIGNALS

Note: This sidebar will be based on interview with Dr. Brazelton. I've contacted Ethan Howard in his office and am waiting for a response—either an appointment to interview him on the subject, or a published piece that could be used as the basis for this sidebar. (If time runs out, I can write this based on available materials and ask his office to okay it.) RS

SIDEBAR 5

CHILD CARE AND THE FAMILY

Just as research on the inner workings of the brain has ironically directed attention outward to the importance of the environment, research on child care has affirmed the centrality and durability of the family in the development in young children.

Today, the vast majority of families are sharing the rearing of their children with child care providers, starting in the very first few weeks of life. We know from the new national study of infant child care funded by the national Institute of Child health and Human Development that 80 percent of infants in the United States experience some regular non-maternal child care during the first 12 months of life. Most of these babies started child care before their four-month birthday; they are in care typically for close to 30 hours a week. We are talking about a very high "dosage" of early child care for most U.S. babies.

The good news is that, according to research, young children—including babies—can thrive in child care when it is of high enough quality. In fact, by placing your children in high quality child care, you can actually supplement what you are giving them at home. That is why the importance of making high quality child care affordable for more families cannot be undervalued.

Moreover, placing a baby in child care does not interfere with the development of the mother-infant attachment relationship or the father-infant attachment relationship. So long as parents spend enough time with their babies to become confident caregivers and understand their needs, their bonds with their children will be extremely resilient. No matter when families first start child care, no matter how much child care they use, the family remains by far the most powerful influence on their children's development.

Make sure this is right

The bad news is that most of the settings where American children receive out-of-home care fall short of any standard that could be considered optimal. "Barely adequate" has become the term of art to describe the typical child care arrangement in this country. Virtually every study that has involved actually going inside child care settings and observing what happens has found that about 15 to 20 percent—one out of every five or six programs—are in fact dismal and even dangerous. And those are the settings that will let us in to observe them! Infants seem to get the poorest quality of all. Of course, we also see fabulous child care in all kinds of arrangements, whether it is from grandma or a teacher in a child care setting.

Neuroscience tells us that these suboptimal child care environments should affect early development. Child care research confirms that they do. The quality of the child care environment significantly affects virtually every aspect of development that we know how to measure, whether it is problem-solving skills or social interactions or attention span or verbal development.

The key to raising quality lies with the caregiver. Good caregiving looks a lot like good mothering and good fathering. Children show significantly better cognitive and language skills, as well as social and emotional development, when they are cared for by adults who engage with them in frequent, affectionate, responsive interactions, who are attentive and know how to read a baby's signals and respond to the baby's temperament.

We know how to provide high-quality child care. The unified efforts of the four branches of the military have proven this, as has Head Start. We need to improve adult-to-child ratios; expand training and create career ladders for caregivers; reduce staff turnover by improving pay and benefits; and strengthen parent involvement.

Adapted from the presentation by Dr. Deborah Phillips

SIDEBAR 6

THERE'S NO PLACE LIKE HOME

The story goes that when a notorious thief was asked why he robbed banks, he answered: "Because that's where the money is." When it comes to family support and parent education, home visitation has proven to be one of the most effective approaches because—at least in the first weeks of life—that's where the babies are. Home is also where new mothers and fathers are likely to be most comfortable, and coming to them signals to parents that what they do matters, that the effort they have spent creating a safe, secure home for their family is appreciated.

Except in cases where children are considered to be at risk of abuse or neglect, home visits are generally voluntary. Some parents choose not to open their doors to visitors, but will accept written information and referrals; others may prefer to meet visitors in public places, such as a church, community center, or even a local diner. Flexibility is a key to successful home visitation.

But most parents welcome the information and advice that nurses or other trained home visitors can offer. They are grateful for advice based not on theory or on assumptions about typical families, but on the realities of their day-to-day lives. They look forward to having a professional (or experienced caregiver with special training) give feedback based on how their child responds at home—not in an office or examining room. And parents can also chat and ask questions more comfortably, and accept suggestions more readily, when the conversation takes place on *their* turf.

Home visits can benefit all kinds of families, but have been shown to be especially helpful to mothers who are young, have little income, or are raising a child alone. Research shows that in these cases, regular home visits by nurses during pregnancy and a child's first two years improve children's health status and social adjustment.

Home visitation services may be offered through community-based organizations, preschools, health clinics, or neighborhood family-child centers. The visitors may be nurses, social workers, or parent aides. In many cases, home visits are offered as part of more comprehensive family support and parent education programs. Many well established programs, including Parents as Teachers (PAT), Healthy Families America (HFA), Home Instruction Program for Preschool Youngsters (HIPPY), Avance, and Parent-Child Centers, include home visits. In addition, a number of states, including Vermont and Missouri, have made home visitation a cornerstone of their efforts to improve results for young children and their families.

SIDEBAR 7

ON THE LAND, IN THE AIR, ON THE SEA...AND IN THE SANDBOX

Americans can take pride in the fact that their armed forces are state-of-the-art strategists and—when necessary—superb combatants. But few realize that they are also among the world's finest child care providers. That is why President Clinton has asked the Department of Defense to share its success with civilian child care centers.

Today, about 1.5 million men and women are on active duty in our nation's armed forces. Nearly 40 percent of them have small children who need care while their parents are at work. But affordable, high-
quality is often hard to come by in the places where military families are stationed.
The military responded, over recent decades, by setting up its own child care centers, but these facilities tended to be overcrowded and understaffed. Pay was low, staff turnover was high, and parents' morale plummeted. By 1990, the situation was considered serious enough to undermine military 's readiness.

Since 1990, the Department of Defense has committed substantial resources to expanding and improving its child care services. The goal was to reduce absenteeism, increase commitment, and most importantly, allow men and women in uniform to focus on their jobs, reassured that their children are safe and well cared for.

Worldwide, the military's child care programs now serves more than 150,000 children each day. Every military base offers a range of child care options, including full-day, part-day, and hourly child care services, as well as part-day preschools. The military oversees more than 530 child care centers on bases as well as some 10,000 family child care homes in base housing run primarily by soldiers' spouses. There are also some 300 facilities where school-aged children can receive care before or after school hours.

By investing in its staff and stressing training, the Department of Defense has become not only one of the nation's largest child care providers, but also one of the best. Anyone with a high school diploma can begin work in one of its preschools, but "basic training" is a must. In addition, all staff must take part in at least 24 hours of training annually—more than twice the national average for child care workers. Those who provide care in their homes must also take part in a demanding training program run by specialists in early childhood education and are monitored on a monthly basis. The military pays for the training, which follows a sequential curriculum and leads to certificates and academic degrees. The military has also created a career ladder for caregivers—something that is sorely lacking in most early care and education. As staff become more qualified, they can earn pay hikes and move into more responsible positions.

A key to effective reform was the recognition that children suffer when their caregivers are underpaid. By law, the Department of Defense is now required to provide child care workers wages and benefits equivalent to those for other entry-level jobs on military bases. Higher pay has dramatically reduced staff turnover, so children can form secure attachments to consistent, experienced caregivers. Other reforms have included improved teacher/child ratios, strict enforcement of standards, frequent inspections, and active parental involvement. As a result, 70 percent of the military's child care centers have been accredited by the National Association for the Education of Young Children, compared with 5 percent of centers nationwide.

These improvements have doubled the costs per child, but parents and the government split the bill. Parents' fees are set on a sliding scale based on family income. The Department of Defense's total costs for subsidizing all child care facilities on military bases totalled $269 in 1996.