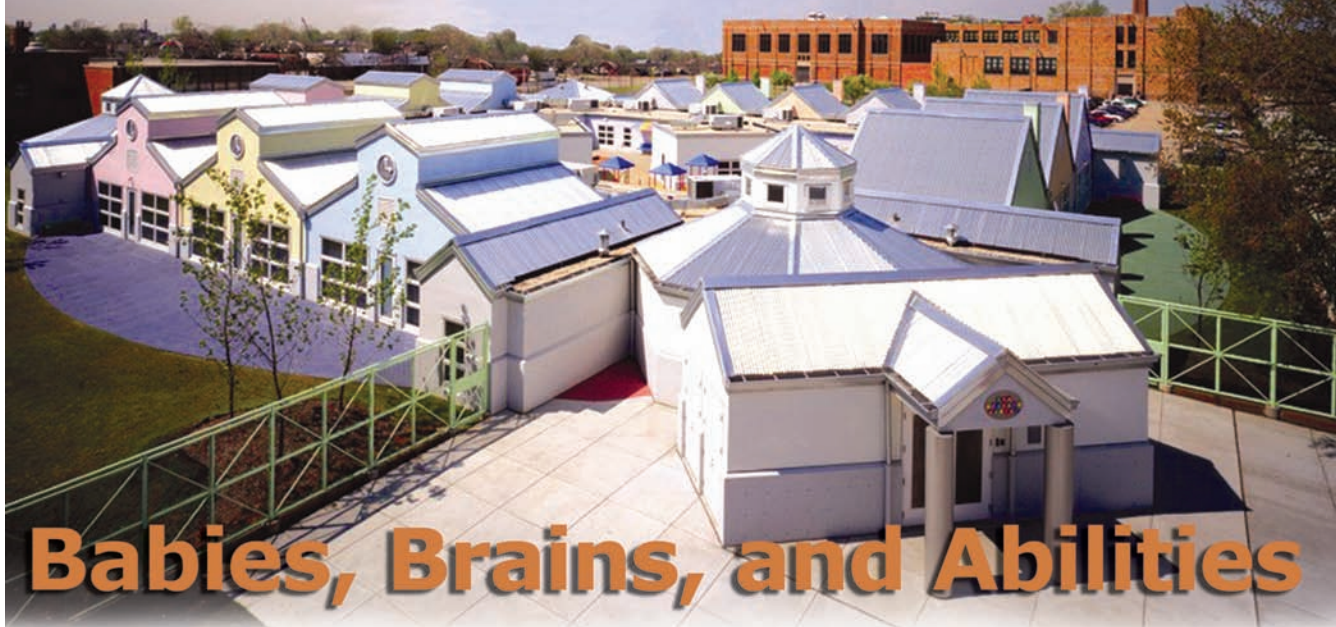


The nation's first Educare school opened in 2000 in Chicago. The building was designed by the renowned architect Stanley Tigerman.



Babies, Brains, and Abilities

How early investments in education shape life outcomes

BY BETTY JOYCE NASH

In a poor Southside neighborhood where some Chicago cabbies won't even venture, there's a school designed by famed architect Stanley Tigerman. Pastel peaked-roof classrooms enclose an outdoor courtyard. Inside, natural light floods halls and classrooms. The world-class design reflects the school's world-class ambition — to close a persistent achievement gap that threatens economic growth. Children, educators, and parents are building a foundation for human capital, arguably society's most valuable asset. The school serves as a model for early education — birth to age 5 — for kids who need it most.

This is the nation's first Educare school, which opened in 2000. The Educare Learning Network, funded by multiple philanthropic partners, has helped start 13 Educare schools coast to coast.

Inside one classroom, babies squeal, coo, and, of course, cry. They're still transitioning into the school day and the school year. Educare Learning Network's executive director, Portia Kennel, explains that these eight children and three teachers stay together three years. That bond nurtures emotional security, critical for healthy social, emotional, and cognitive development. "What do you think that baby's learning about the world?" she says, pointing out a child being comforted. "That he matters. That's the beginning of learning. You have to know you matter." Insecure attachment has been associated with later behavior problems.

Two Educare schools are bound for the Fifth District. A \$12 million Educare school will open in the District of Columbia in 2012, in the Anacostia area. Another is under development in East Baltimore, connected with Johns

Hopkins University. Others operate from rural Maine to Miami to Seattle to Omaha, with philanthropic partners such as the Gates Foundation in Seattle and elsewhere and the foundation of basketball star Steve Nash in Phoenix.

Educare seeks to bridge the ability gaps that open up at early ages between individuals and across socioeconomic groups. Those gaps exist for both cognitive and non-cognitive skills, according to James Heckman, a Nobel Prize-winning economist at the University of Chicago. Without early intervention, these differences can show up by 18 months.

Economists once thought of childhood as a single stage, and assumed investments at various stages were perfect substitutes, Heckman notes. But they're not. Timing matters: Early investments yield stronger, more cost-effective results than later ones, he argues.

Nurturing Human Capital

Educare isn't day care. It's education all day, all year. It's research-based, monitored, professionally delivered, and tailored to the child. Kennel notes, "If teachers don't know where children are developmentally, how can they individualize, how can they help them?"

Education offers the best potential exit from the cycle of poverty. Early intervention makes the biggest difference in the lives of poor children, who in 2010 comprised 25 percent of the population aged 5 and under. Poor children typically enter kindergarten with fewer vocabulary words and preliteracy skills (identifying letters and sounds, carrying on conversations) than middle-class children. Educare's

students score near the national mean for all children on the Bracken Basic Concepts Scale, with children who spend more years in Educare scoring better, according to the FPG Child Development Institute at the University of North Carolina at Chapel Hill. The scale evaluates communication development and school readiness; literacy abilities at this age predict 11th grade reading success.

Preliminary results are also positive for social and emotional skills such as initiative, attachment, and self control: Educare children enter kindergarten with average or above average skills compared to a national sample of children of all risk and income levels.

That's critical because skills are hierarchical, notes Noreen Yazejian, the principal investigator for a randomized-control study, currently under way, of Educare participants. She is a scientist at the FPG Child Development Institute.

"Adaptation is a lifelong thing, but brain circuitry and associated behaviors develop during sensitive, early periods," Yazejian says. She cites studies on Romanian orphans, neglected early in life, who showed brain-development delays.

The theory of how human capital develops has evolved along with brain science. The main ideas: Later skills build on earlier skills; development is multistage and involves environmental and genetic interaction; and abilities include not only intelligence but also social and emotional ones.

Another dimension of human capital development is its "dynamic complementarity," according to Heckman. When one component of intelligence is improved, that increases

the value added by later learning. This means skills produced at one stage raise the productivity of investment at subsequent stages. Consequently, he argues, the later in life we try to address early deficits, the more it costs. Scientists now know that variations in human characteristics emerge through interactions among genes, the environment, and human capital investments. The once-heated nature vs. nurture debate seems antiquated.

Early intervention has been shown especially to improve noncognitive skills such as attention, self-control, and the motivation to learn. Those abilities fertilize later learning. Kindergarten readiness relies not only on thinking skills but also on physical health, good verbal communication, enthusiasm, curiosity, and the ability to take turns, sit still, and pay attention. Predictable, responsive infant care sets the stage for the formation of these and other skills.

The gap between advantaged and disadvantaged families widens, say Heckman and others, as highly educated, wealthier mothers and fathers spend more time and money on their children and less-educated and poorer parents spend less, on average. As relatively well-educated women work disproportionately more than less-educated women, they have even more resources to spend on children; they also engage with children's schools in far greater numbers. Doing so becomes more difficult in single-parent families, and their numbers are growing.

Talking the Talk

Forty years ago, the prevailing notion was that young infants didn't learn, says developmental psychologist Craig Ramey, now at the Virginia Tech Carilion School of Medicine and Research Institute. But in lab studies between 1968 and 1974 at the University of California at Berkeley, he found that even at six weeks, they could do more than that. "They could show us, up to three months later, in laboratory situations, that they could remember what they'd learned. That was big, breakthrough news."

He also studied children with "failure-to-thrive" syndrome, ranging from 6-month-olds to 2 1/2-year-olds. "They were developmentally delayed — they might have had the repertoire of a 3-month-old," he recalls. "I was able to show if we could engineer the right kinds of feedback for those kids, who tended to be virtually inert, that we could get them to show a tremendous amount of developmental recovery."

With a collection of studies under his belt, Ramey got the funding to scientifically investigate the prevention of developmental delay. Now famous, the series of studies known as the Carolina Abecedarian Project grew from the study he launched, a randomized-control investigation carried out at the FPG Child Development Institute, which had recruited Ramey.

Selected Results of Three Early Childhood Studies

Study:	Carolina Abecedarian	HighScope/Perry	Chicago Child-Parent
Date, design:	1972-1977; random control trial	1962-1967; random control trial	1985-1986; matched neighborhood
Location:	Chapel Hill, N.C.	Ypsilanti, Mich.	Chicago
Sample size:	111	123	1,539
Ages:	Infant to 5	3-4	3-4
Schedule:	Full day, year-round, weekly home visits	Half-day, school year, weekly home visits	Half-day, school year
Crime:	No significant reduction in self-reported convictions, age 21	32 percent v. 48 percent arrested for violent crimes, age 40	16.5 percent vs. 21.1 percent arrested for felony
Education:	35 percent graduated or attending 4-yr. college vs. 14 percent (age 21)	65 percent vs. 45 percent HS grad (female: 84 percent vs. 32 percent) (age 40)	71.4 percent HS grad vs. 63.7 percent; 4 yr. college attendance 14.7 percent vs. 10 percent (age 23-24)
Employment:	65 percent vs. 50 percent (age 21)	76 percent vs. 62 percent (age 40)	42.7 percent vs. 36.4 percent (age 23-24)
Cognitive effects:	Higher language, reading, math scores through age 21	Higher achievement test scores age 9-11; higher literacy scores ages 19, 27	Higher achievement test scores in adolescence
Return per \$ spent:	\$4.10 (Masse & Barnett, 2002)	\$7-\$10 (Heckman et al., 2009)	\$7.10 (Reynolds et al., 2001)

SOURCE: Project websites

Four cohorts of children born between 1972 and 1977 were assigned at random as infants to the intervention or the control group. All came from lower-income families; the intervention group got full-time care from infancy through age 5. Abecedarian followed up at ages 12, 15, 21, and most recently at age 30. At age 21, those in the treatment group earned higher scores on intellectual and academic measures as young adults, had more schooling, were more likely to attend a four-year college, and were older when their first child was born. Publication of age 30 results is pending.

Latesha Foushee now works at the center where she once was studied, from the time she was 6 weeks old, in 1975, until she was age 5. When she was born, her father was 16 and her mother, 19. “In the neighborhood I grew up in, everyone was in public housing,” she says. “I see friends who still live in the same housing development their parents lived in, see that cycle they fell into, and some have gotten into drugs. When you’re given an opportunity to grow and to learn and to know, that opens the door to success.”

Foushee has worked in child development for 17 years. At FPG she teaches children to play in order to learn. Communication is constant. Infants learn sign language, for instance, to signal their needs. The teachers promote friendship, the ability to get along. “Some kids are very shy and need prompting on how to handle situations,” she says. “To make friends, we may say, ‘I see Sam is at the table playing with blocks. Would you like to join Sam and me at the table? Why don’t you ask Sam if you can help him play with blocks?’” As she relates this example, her voice assumes a friendly, energetic tone, as though she really is speaking to the children in question.

The Abecedarian and similar small-scale studies showed that high-quality interventions boosted cognitive and noncognitive skills. Though effects on intelligence tests weren’t long lasting in some cases, other effects were. “The issue of whether you can make major changes and whether they have long-term consequences — that issue is settled, in principle,” Ramey says. Today, he’s focused on the first three years of life, a period over which differences emerge “in a very reliable and dramatic way.” The brain may be the body’s most genetically influenced organ, he notes, but it’s also the most malleable.

Think about language. No one knows just by observing a child what language he or she will speak. “And over three years you have this incredibly complex, flexible linguistic system in place, contingent on who’s been caring for the kid and what their characteristics are,” he says. “To me, that’s always been a dramatic example of how we get influenced by our surroundings.”

The sheer number of words a child hears predicts later literacy. In a 1995 study, psychologists Betty Hart, a professor emeritus at the University of Kansas, and the late Todd Risley recorded and analyzed verbal interactions in 42 families of varying occupational backgrounds from the time children were 10 months until age 3. Children of parents with professional jobs heard an average of 2,153 words per



To practice continuity of care, children at Educare stay with the same teaching team from birth to age 3. This also fosters emotional security.

hour; those of parents with working-class jobs, 1,251 an hour; and those of parents receiving welfare benefits, 616. The authors concluded that quantity matters. The amount of talk between children and caregivers may be the most important aspect to evaluate in child-care settings.

Talk and response is crucial, says Liz Pungello, a developmental psychologist at FPG on the Abecedarian team. “The more you can wash them with words, the more all those synapses are being stimulated really early on.”

Scaling Up

The successes of small-scale early interventions, though, have eluded the nation’s largest efforts to close gaps for disadvantaged kindergarteners. Those began with the federal Head Start program in 1965, which now serves about 40 percent of children ages 3 to 5. Eligible children are those in foster care or whose families are homeless or poor enough to receive government aid such as Temporary Aid to Needy Families. Head Start pioneered the concept of kindergarten readiness for the poor at a time when new evidence showed poor children face extra risks. Early Head Start began in 1995; about 5 percent of eligible infants and toddlers through age 3 are enrolled.

Today, low-income parents also have other child-care options. Forty states fund prekindergarten programs, though state per-child spending fell by an average of \$114 in the 2009-2010 school year. That includes funding from the 2009 American Recovery and Reinvestment Act, according to the National Institute for Early Education Research. The FPG Child Care Center, for instance, will close permanently in 2013, due to state and grant agency budget cuts. (The Child Development Institute, however, will continue research.)

Head Start quality is uneven and outcomes mixed, much as schools in general vary. Some studies find that academic effects fade by age 8, especially for children who subsequently attend relatively poor-quality schools, more likely for black children than white. Evidence is mixed about whether Head Start kindergarteners are more prepared

generally, socially and emotionally, than those who did not participate in the program.

Ramey and his wife, Sharon Landesman Ramey, note in a paper that the most effective elements of the early demonstration programs have proved problematic for Head Start: documentation, unannounced classroom assessments, timely reports about the program's quality, good attendance rates and records, an appropriate "dose" (hours per day and weeks per year), highly trained staff, and ongoing professional development. About half of Head Start's programs are half-day, and many operate fewer days than a traditional school year. Children spend, on average, just 25 hours a week in a Head Start classroom, with gaps filled by another publicly funded provider. And its teachers don't get paid as much as regular public school teachers.

It's tough to successfully scale up the models such as Abecedarian and the Perry Preschool Project, a Michigan program for disadvantaged black children in the 1960s that benefited the treatment group. One problem is knowing exactly what works. Early childhood research has yielded insights into "structure" and "process." Structure includes elements such as the number of books in a classroom, teacher education, teacher-student ratios, and overall student numbers. The "process" is more mysterious. It's what happens when teachers and students interact, Pungello says. "I can pretty much tell you that if you have one teacher and 12 infants there is no way you will have good process. If you give me one teacher and three infants, I'm allowing for the possibility of good process, but it's not guaranteed."

Scaling up is also partly a funding problem, partly a validation problem. Economist Janet Currie of Princeton University has noted that most evaluations of public programs are "less conclusive than evidence showing effects of

model programs, mostly because there have been very few well-designed studies of longer-term effects."

Though Head Start may have fallen short of closing the gap between poor and middle-class children at kindergarten as Congress intended, its contributions are many and tend to be taken for granted today. The fact that poor kids get immunizations, medical, dental, and mental health care, for instance, is due in no small part to its influence, the Ramey paper notes. Many state pre-K programs draw on the Head Start model.

No Dollar Left Behind

Educare schools blend Head Start funds, which are granted to qualifying community partners, with state and local preschool funds. These schools also rely on one or more philanthropic partners for startup. To operate, Educare spends about \$17,000 to \$18,000 a year per child; the average preschool spending per-child in 2009-2010 was \$4,831. Early Head Start funds, however, may average \$9,000 to \$11,000.

Educare of Chicago is typical: Fifty-two percent of funds come from Head Start/Early Head Start, and another 24 percent from state and local education funds. About 11 percent flows from the private sector. The schools cost about \$8 million to \$12 million to build, with donors' money. On the expense side, some 60 percent of funds go toward salaries. The Educare facility in Chicago is a Chicago Public School building, maintained by CPS.

The salaries make the Educare approach more expensive because it uses a higher teacher-student ratio than most preschools. Educare classrooms have three teachers with credentials in early childhood education: one with at least a bachelor's, one with an associate's degree, and a teacher's aide with a certificate. "Master" teachers also are on staff. Those teachers hold advanced degrees and supervise three to four classrooms apiece.

Educare schools also include child psychologists and counselors to support families. Parent involvement is cultivated. Parents begin to consider their future, Kennel says, as they ponder improved lives for their children. They also are more likely to volunteer in schools later on, as children progress through the educational system.

Educare parents Marquia Fields and Kenya Conley in Chicago cite family literacy nights, for example, as at-home efforts they've learned. These help build their children's vocabulary and thinking skills. Parents like Fields and Conley can also take yoga or personal finance classes. Educare has helped both mothers navigate deadlines and paperwork to get their children into charter elementary schools. Both have older children at Donoghue, affiliated with the University of Chicago and known for academic success. In 2011, 94 percent of its third-graders met or exceeded state math standards. Fields and Conley have served on countless committees at Educare — dealing with fiscal or hiring issues or curricula. They've gotten pretty good at drawing reluctant parents into the fold. An involved parent



Parents Kenya Conley (left) and Marquia Fields (right) visit in Educare of Chicago's family center. Involved parents are essential to Educare's mission as they support children's learning and development. The parents also serve on school committees.

who knows what quality education looks like can volunteer, question the status quo, and influence not only the child's success, but also that of the school. Educare teaches everyone to be a catalyst for change.

Educare also has enhanced their parenting skills, both say. In Wal-Mart one day, Fields calmed her unruly child by discussing the trip, its purpose, and length. "I call that Educare talk," she says. She's more patient. "Now, I am more likely to talk and reason with her."

She and Conley now use expressions like, "Use your listening ears," or "Use your walking feet," requests that promote cooperation and, of course, literacy.

Pie in the Sky Preschool

Human capital theory and top-quality early childhood intervention show the potential of returns to society that exceed alternative public and private investments.

In a *Journal of Economic Perspectives* article, Currie notes that investing in early childhood may be more cost-effective than remediation later, also noted by Heckman and other economists. "In many cases, an ounce of prevention is worth a pound of cure," she writes. Overcoming early disadvantage is often difficult later — returns are relatively low for efforts to train low-skilled adults. And Heckman's research on those who receive General Education Diplomas shows that their earnings are the same as high school dropouts, suggesting that later investments don't compensate for early deficiencies, particularly noncognitive skills such as tenacity and the ability to defer gratification.

But to scale up a program to improve early childhood experiences will be slow and the learning curve steep. Some economists advocate early education as an economic development strategy instead of location incentives for firms. Economist Timothy Bartik describes early childhood education as a policy lever with significant effects on labor force quality per dollar invested. Bartik is with the W.E. Upjohn Institute for Employment Research. "Businesses are increasingly footloose — you don't have to be near suppliers or

natural resources because transportation and communication costs are lower," he says. "Increasingly what is driving business decisions is the location where you can find the best labor force to best meet your needs."

Bartik points out that two-thirds of people spend their working careers in the state where they grew up. State work-force investments in early education might pay off in the long run through increasing the local skilled labor supply. A favorable business climate depends not only on factors such as taxes, but also on labor quality.

Cost-benefit analyses show positive returns for the high-quality early childhood interventions. For the Abecedarian Project, the estimated annual return is \$4.10 per dollar invested, to individuals in the form of increased earnings and to society through increased income tax revenues as well as avoided costs of special education, welfare, and crime. For the Perry Preschool Project, through age 40, benefits are \$7 to \$10, according to Heckman's calculations.

Still, a massive overhaul of early childhood programs with public funds seems unlikely, even though Educare supporters note that the program stretches scarce public money by engaging private-sector partners.

Efforts to form Educare schools start at the grassroots of a community. There's a carrot — more than \$1 million in grants — for a community that successfully starts a school. The grants come from combined funding through major foundations.

Not only does Educare aim to change parents' and students' lives, a lofty goal, but Educare also exists to improve all early education, says Carol Howard, director of the D.C. Educare. "Part of our charge as responsible members of that community of care is to work with providers to have an influence that raises the bar in all the environments." She points out that capacity for the District of Columbia school will be only 175 children. That falls short of demand, by a long shot. "The challenge becomes how do we do our best work with children and families and share that so that it can be replicated beyond the walls of the center." **RF**

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