

Laying the Foundation

Researchers look for better ways to quantify the benefits of investment in early childhood development

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Contributing Writer

The foundation of every state is the education of its youth.

So said the Greek philosopher Diogenes—and University of Minnesota President Robert Bruininks, in his welcome to participants at a two-day conference in December 2007. And according to speakers who addressed the forum, educating youth *early* is the key to a solid foundation. Learning how best to do that was the goal of the conference. More than 80 participants from across the country attended “The Human Capital Conference Series on Early Childhood Development: Critical Issues in Cost Effectiveness in Children’s First Decade” on December 7 and 8. They heard from 20-plus academicians about research on a wide variety of early childhood development issues, with a focus on methodology and cost-effectiveness.

The conference, co-sponsored by the Federal Reserve Bank of Minneapolis and the University of Minnesota through its partnership organization, the Early Childhood Research Collaborative (ECRC), was part of an ongoing national discussion sparked, in part, by a series of studies by the Minneapolis Fed’s Art Rolnick and Rob Grunewald (available online at minneapolisfed.org). Rolnick, senior vice president and director of Research, and Grunewald, associate economist, synthesized and built upon previous studies of early childhood preschool programs and confirmed the long-term financial benefit to society from investing early in high-risk children.

A good deal of that prior research was conducted by Nobel Laureate James Heckman, professor of

economics at the University of Chicago and member of the ECRC National Advisory Committee. “His research,” said Minneapolis Fed President Gary Stern in an address to the conference, “was the foundation for the work produced at this Bank and by the University, and has influenced every serious economic and policy research project on this issue, which means he has also had a vicarious hand in many of the policy reforms taking place across the country.” (See more about Heckman and colleagues below.)

Stern also clarified the Fed’s interest in early childhood development. Paraphrasing economist Robert Lucas’ query as to why some countries are

What Is the ECRC?

Collaborative efforts between the University of Minnesota Center for Early Education and Development and the Federal Reserve Bank of Minneapolis resulted in the creation of the Early Childhood Research Collaborative, the sponsor of the conference. The ECRC’s goal is to bring together prominent researchers and faculty members across disciplines to initiate and synthesize research on cost-effective investments in early childhood development and to conduct high-profile policy discussions on early childhood development. The ECRC focuses on children from birth to age 8, and on topics that include the impact and cost-effectiveness of preschool and family support programs; family, school, and community influences on child development; and psychological and biological foundations of child health and well-being.



*Deborah Vandell, University of California-Irvine
Helen Raikes, University of Nebraska*



*Larry Schweinhart, High/Scope Educational Research Foundation
William Gormley, Georgetown University
In the background: David Olds, University of Colorado*



*Frances Campbell, University of North Carolina
David Olds, University of Colorado Health Sciences Center
Barbara Devaney, Mathematica Policy Research*



*Art Rolnick
Federal Reserve Bank of Minneapolis*



*Robert Bruininks, President
University of Minnesota*



*Flavio Cunha, University of Pennsylvania
James Heckman, University of Chicago
Rodrigo Pinto, University of Chicago*



*Arthur Reynolds
University of Minnesota*



*Rob Grunewald, Federal Reserve Bank of Minneapolis
Steve Barnett, National Institute for Early Education Research
Robert Lynch, Washington College*



*Edward Zigler
Yale University*

richer than others, Stern asked, “Why are some states and cities better educated than others? These are the types of questions that perplex policymakers and economists, and also Federal Reserve banks, and that’s why we keep asking them.” Stern then quoted other Fed presidents on the value of early childhood education, ending with the following statement from Fed Chairman Ben Bernanke:

“Although education and the acquisition of skills is a lifelong process, starting early in life is crucial. Recent research—some sponsored by the Federal Reserve Bank of Minneapolis in collaboration with the University of Minnesota—has documented the high returns that early childhood programs can pay in terms of subsequent educational attainment and in lower rates of social problems, such as teenage pregnancy and welfare dependency. The most successful early childhood programs appear to be those that cultivate both cognitive and noncognitive skills and that engage families in stimulating learning at home.”

Building on previous work

While a similar joint conference in 2003 focused on research that demonstrated the economic value of early childhood development and education, the 2007 conference delved deeper into research methods and theories in an attempt to explain the sustained impact of early childhood education and interventions. Presenters described their research into larger, public programs, looking for incontrovertible, long-term results. And nearly all asked: How can current research direct or inform public policy on how and where to invest?

Conference co-host Arthur Reynolds, ECRC co-director and University of Minnesota professor of child development, noted that a critical mass of evidence is now available that shows early childhood interventions pay off, and he cited common elements of programs that show high economic returns: focus on at-risk children, more than one year of participation, well-trained and compensated staff, and high-quality services, among others.

Speakers also had the opportunity to show how their research fit into the continuum of child development, as conference sessions started at the beginning of a child’s life and took participants through the early grades. Each presentation built upon the previous, chronologically and developmentally,

with cost-benefit analyses a part of many studies. Researchers used a variety of methods: experimental design, longitudinal studies, mining data of large-scale studies, regression discontinuity design, pathways and the current models out of the University of Chicago. Regardless of the method, the object is to study the data and, if results warrant, make a case for investment in early childhood education.

The triumvirate of early childhood research

Three longitudinal studies—the Perry Preschool Project, the Carolina Abecedarian Project and the Chicago Child-Parent Center preschool program—form the core of research into early childhood development, and the 2007 conference participants discussed lessons to be drawn from each.

High/Scope Perry Preschool

Presenter: Larry Schweinhart, president, High/Scope Educational Research Foundation

Begun in the early 1960s, the Perry Preschool Project is one of the most widely cited early childhood studies because of its random assignment method and long-term follow-up research. The study tracked 123 African American children in Ypsilanti, Mich., from preschool to adulthood. Schweinhart talked about how to take the very successful, if small sample, Perry Preschool Project to scale. Schweinhart pointed to those program components that can be replicated on a larger scale, such as focusing on 3- and 4-year-olds whose parents lack schooling and skilled jobs, a class of 16 with a state-certified preschool teacher and an assistant teacher trained in a validated child development education model, and ongoing visits by teachers to children and their parents or caregivers.

Schweinhart also struck a challenge for research: Study the effects of replications and applications of the model programs, for as much as Head Start, state preschool programs and other early child care centers may try to replicate Perry, they fall short because of inadequate funding, a shortage of certified lead teachers and a lack of home visits. These other programs “give application priority over replication,” Schweinhart said. “If they want the effects, they have to pay the price.”

Carolina Abecedarian Project

Presenter: Frances Campbell, University of North Carolina

Another of the seminal studies is the Abecedarian project conducted at the University of North Carolina during the 1970s and '80s. The program, which also used the random assignment research method, served children from infancy to kindergarten entry, and follow-up studies are ongoing. Data are now being collected on program participants at age 30. The data, said Campbell, suggest "that the more powerful and enduring effects from its two phases of intervention were due to the five years of educational intervention from infancy to kindergarten entry." In addition, project data indicate that "having reliable child care during the preschool years makes a difference in the lives of very young mothers."

Child-Parent Center Preschool

Presenter: Arthur Reynolds, University of Minnesota and co-director of the ECRC

The Chicago Child-Parent Center (CPC) preschool program study differs from the Perry and Abecedarian projects in that subjects were not randomly assigned. Reynolds and others have used a quasi-experimental design that compares participants with similar children who did not attend, primarily because the service was not available in their areas. The study focuses on children born in 1979-80 who participated in the program between 1983 and 1985 in Chicago's highest-poverty neighborhoods. The CPC is also the first cost-benefit analysis of a public preschool program, and the findings "increase the generalizability of results to publicly funded programs, including emerging universal access programs," said Reynolds.

Applying lessons to today

While these three studies have provided invaluable insights, analysts note that they are based on interventions made 20 to 40 years ago and so may not apply to young children today. Edward Zigler, Sterling professor of psychology emeritus at Yale University, and one of the founders of Project Head Start, reminded participants that "certain facts in the history of early intervention have been lost in

the mist of time." He cautioned against making predictions about future benefits based on the longitudinal studies, particularly the Perry Preschool and Abecedarian projects. "We should rely less on programs mounted decades ago and seek to expand the empirical research that would give us a sound base for predictions and cost-benefits analyses." He suggested that, "if we only use the evidence we have judiciously and conservatively, I remain optimistic that we will eventually produce the sound empirical base adequate to the task of informing policy-makers."

Three presentations in particular sought to address the issues raised by Zigler, through careful reanalysis of early data and development of models to better anticipate effects and understand linkages of early childhood investment.

Reanalysis of the Perry Preschool Study

Presenters: Rodrigo Pinto and Seong Moon, University of Chicago

These students of James Heckman presented two new studies on the impact of the Perry Preschool Project. The first study is a reanalysis of the results, taking into account multiple inference and a slight contamination in the randomization protocol. (Multiple inference refers to the problem of determining which of a set of related outcomes may have happened by chance alone, while minimizing the probability of falsely rejecting any significant outcomes. Anomalies in random assignment can bias results.) The second study is a cost-benefit analysis, which calculated effects on lifetime earnings and highlighted the sensitivity of results to crime-cost accounting. After all of these adjustments, the results show a substantial return to society.


The Technology for the Formation of Skills

Presenter: Flavio Cuhna, University of Pennsylvania
Cuhna, together with Heckman, has developed a theoretical model that predicts the effects of early childhood investments. Their model is based on theory about skill formation, particularly skills formed early in life and those developed later in school and adulthood. School age investments are not substitutes for early childhood investments, they noted, but early investments complement later investments.

Paths of Effects from Preschool to Educational Attainment in the Child-Parent Centers, Perry Preschool and Abecedarian Project

Presenter: Arthur Reynolds

Reynolds shared recent research that looks at these three significant projects to study their common paths from early childhood to adult well-being. If the causal pathways are understood, he said, the research can better inform the types of investments in early childhood education.

For just as education is the foundation of the state, so is solid research the foundation of sound investment in early childhood. 

For summaries of conference papers, go to earlychildhoodrc.org/events/summary.cfm.

40 years and counting

Aside from the three core studies (and reanalyses of them), several other programs provide information on the effect of early childhood investments from prenatal through the early elementary grades. Researchers noted that all such programs show at least some positive impact. A few have shown longer-term benefits; others are too new to provide evidence of their long-term effects, or lack thereof.

Conference participants stressed that much remains to be done. Those involved in program studies can't just stand back and say, "Look how cost-effective these outcomes are," noted one speaker, but need to verify the accuracy of data collection. A number of other issues raised by participants are also likely to guide future research efforts. Among the key recommendations:

- Perform new and careful research, especially focusing on recent, state preschool programs.
- Attempt to link research findings thematically across stages of child development.
- Find better methodology or stronger controls to solidify study findings.
- Distinguish between studies that focus on "efficacy" (knowledge that this intervention works) and "effectiveness," that is, making the intervention work on a large scale.
- Carefully calculate and compare the economic return across ages and program types to aid in public policy decisions.

The 2007 conference was clearly not the final word in research into early childhood development, and participants were eager to return to the field, to improve future research and to sustain the dialogue.