

# Prevention and Cost-Effectiveness in Early Intervention: A 20-year Follow-up of a Child-Parent Center Cohort

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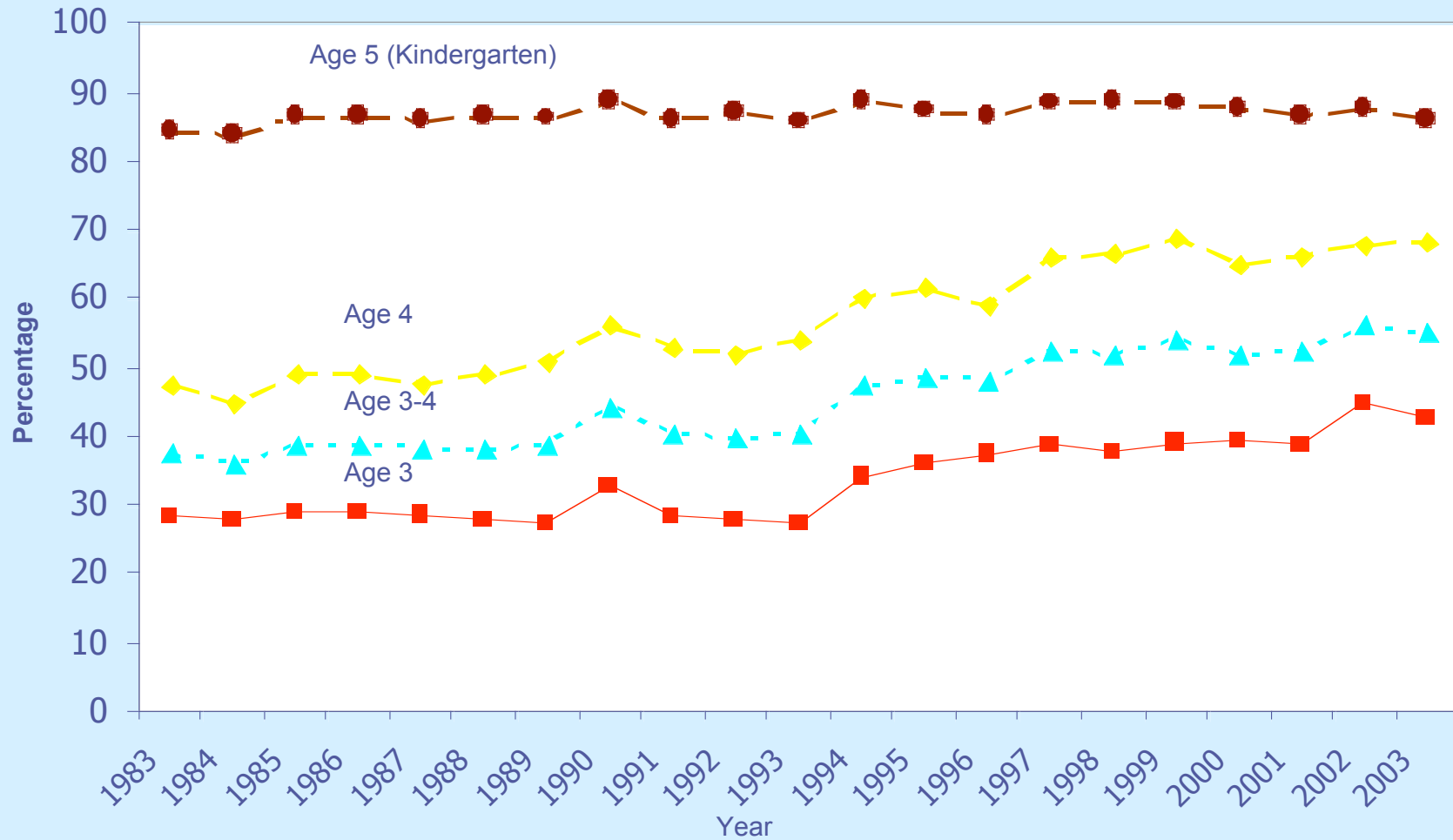
McEvoy Lecture Series on Early Childhood  
and Public Policy

Humphrey Institute of Public Affairs

# Growing Support for Early Childhood Education

- ◆ General public wants state and local government involvement
- ◆ Higher enrollments in early education and care programs
- ◆ Increased funding and political support for early education across the country
- ◆ Growing evidence of beneficial effects

# U.S. Children in Early Childhood Programs



Source: National Center for Educational Statistics (2003)

# Major Questions in Early Education Field

- ◆ Do Effects of ECI Persist Over Time?
- ◆ Which Outcomes are Impacted Most?
- ◆ Do some Children Benefit More?
- ◆ What are the Key Program Elements?
- ◆ Is ECI More Cost-Effective than other Programs?
- ◆ What are Key Sources of Later Effects?
- ◆ Does Evidence Support Universal Access?

# Age at Follow-up for Well-known Early Childhood Interventions

Program	Type	Age at Last Follow-Up
High/Scope Perry Preschool Program	Model	40
Carolina Abecedarian Project	Model	21
Houston Parent-Child Development Center	Model	11
Yale Child Welfare Research Program	Model	15
Chicago Child-Parent Centers	Large Scale	21
Milwaukee Project	Model	14
Syracuse Family Development Program	Model	15
Consortium for Longitudinal Studies	Model	22
Infant and Health Development Program	Model	8
Educational Testing Service Head Start Study	Large Scale	8
Elmira Prenatal/Early Infancy Project	Model	15
PSID Head Start Longitudinal Study	Large Scale	25

## Key Features and Findings for 3 Programs

Feature	High/Scope Perry Preschool	Chicago Child-Parent Centers	Abecedarian Project
Ages of participation	3-4	3-4, 5-8	0-5, 6-8
Program type	Model	Large-scale	Model
Age 5 cognitive skills (ES)	.75	.61	.72
Major effects by age 18	HS comp, achiev, spec ed, delinquency	HS comp, achiev, CAN remediation, delinquency	Achiev, IQ, remediation
Adult Educational effects	HS comp, yrs of ed	HS comp, yrs of ed	College attend
Economic well being	Income	N/A	N/A
Social services	Receipt	N/A	N/A
Health & mental health	None	N/A	N/A
Crime & social behavior	Arrests	N/A	None
Parent outcomes	N/A	Involvement	Employment

## Limitations of the Evidence Base

- ◆ Scant Evidence of Adulthood Effects, especially for Large-scale Programs
- ◆ Outcomes restricted to Primarily Education and Economic Well Being
- ◆ Lack of Attention to Subgroup Effects
- ◆ Impacts of Program Timing and Length Unknown
- ◆ Outcomes for Parents Rarely Tested, especially for Center-based Programs

# Questions for the CPC Follow-up Study

- ◆ Is Participation in the Child-Parent Center (CPC) Program Associated with Greater Adult Well-Being for Children and Parents?
- ◆ Do Effects Extend Beyond Education Outcomes?
- ◆ Do Timing and Length of Intervention Matter?
- ◆ Do Effects Vary by Child & Family Attributes?
- ◆ How Cost-Effective is the Intervention?



# Brief Description

- ◆ 989 complete cohort of children graduating from Child-Parent Centers in kindergarten; they participated from 2 to 6 years. Centers are located in the highest poverty areas of Chicago.
- ◆ 550 children enrolled in an alternative early childhood program in kindergarten in five randomly selected schools serving low-income families. They matched on socioeconomic status.

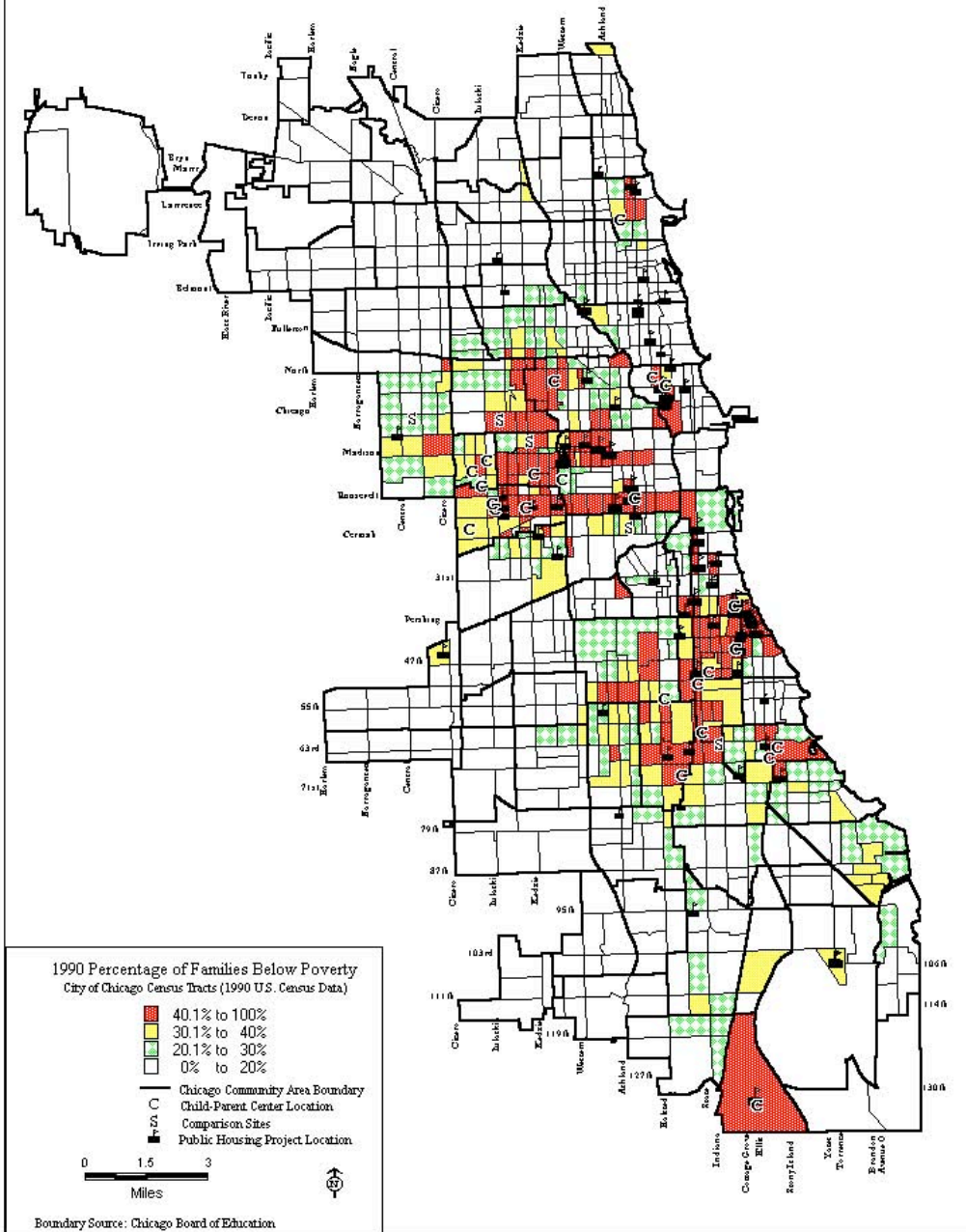
# Characteristics of Study Groups

	<b>CPC Intervention</b>	<b>Comparison</b>
Sample	Complete cohort	Random sample of K sites
Recovery, by age 24	902 of 989 (91%)	487 of 550 (89%)
Key attributes	Reside in highest poverty areas Over 80% of children enroll Mean no. of risks = 4.5; 73% with 4 or more risks Parent ed > than in c-group	Reside in high poverty areas Had school-based enrichment Mean no. of risks = 4.5; 71% with 4 or more risks Area poverty > than in p-group
<b>Intervention levels</b>		
Preschool	100% 1 or 2 years	15% in Head Start
Kindergarten	60% full day	100% full day
School age	69% 1 year 56% 2-3 years	30% 1 year 0% 2-3 years

# Sample Characteristics

- ◆ 1,539 Children Born in 1979 or 1980, attended PK in 1983-85, K in 1985-86.
- ◆ Lived in highest poverty neighborhoods: Mean child poverty rate was 41%.
- ◆ 93% African American, 50.2% female.
- ◆ 75% from single-parent families.
- ◆ Over 60% were receiving public aid.
- ◆ Mean risk index was 4.5 of 8; 73% 4 or more.
- ◆ Recovery rate of 90% by age 24.

### Neighborhood Context in the Chicago Longitudinal Study



## **Two Major Foci**

Basic skills: Language, Numeracy, Listening

Structured Learning Activities

Language and literacy emphasis

Field Trips: Zoos, Museums, Libraries

Parent Involvement:

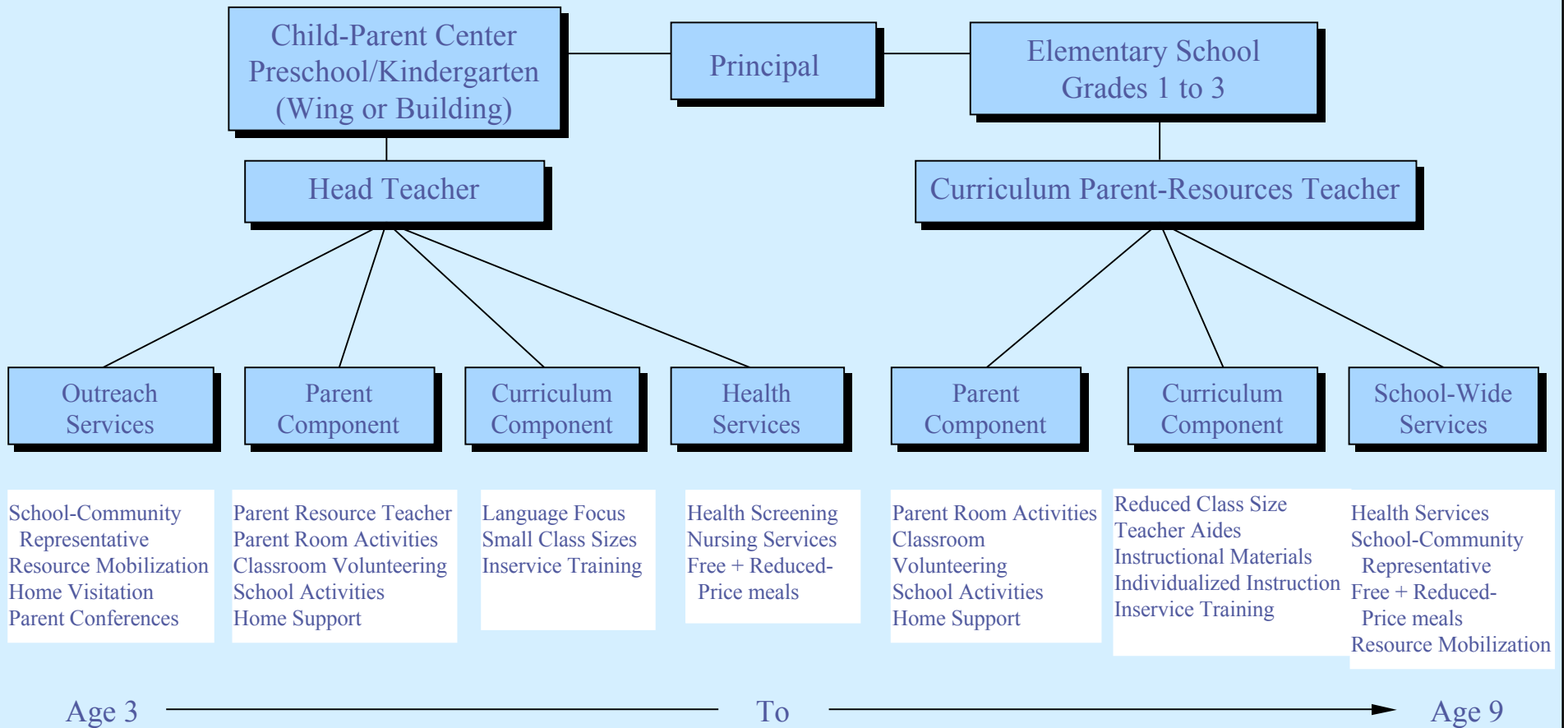
Classroom volunteering

Parent room activities

Educational workshops and training

Home visits and activities

# Child-Parent Centers



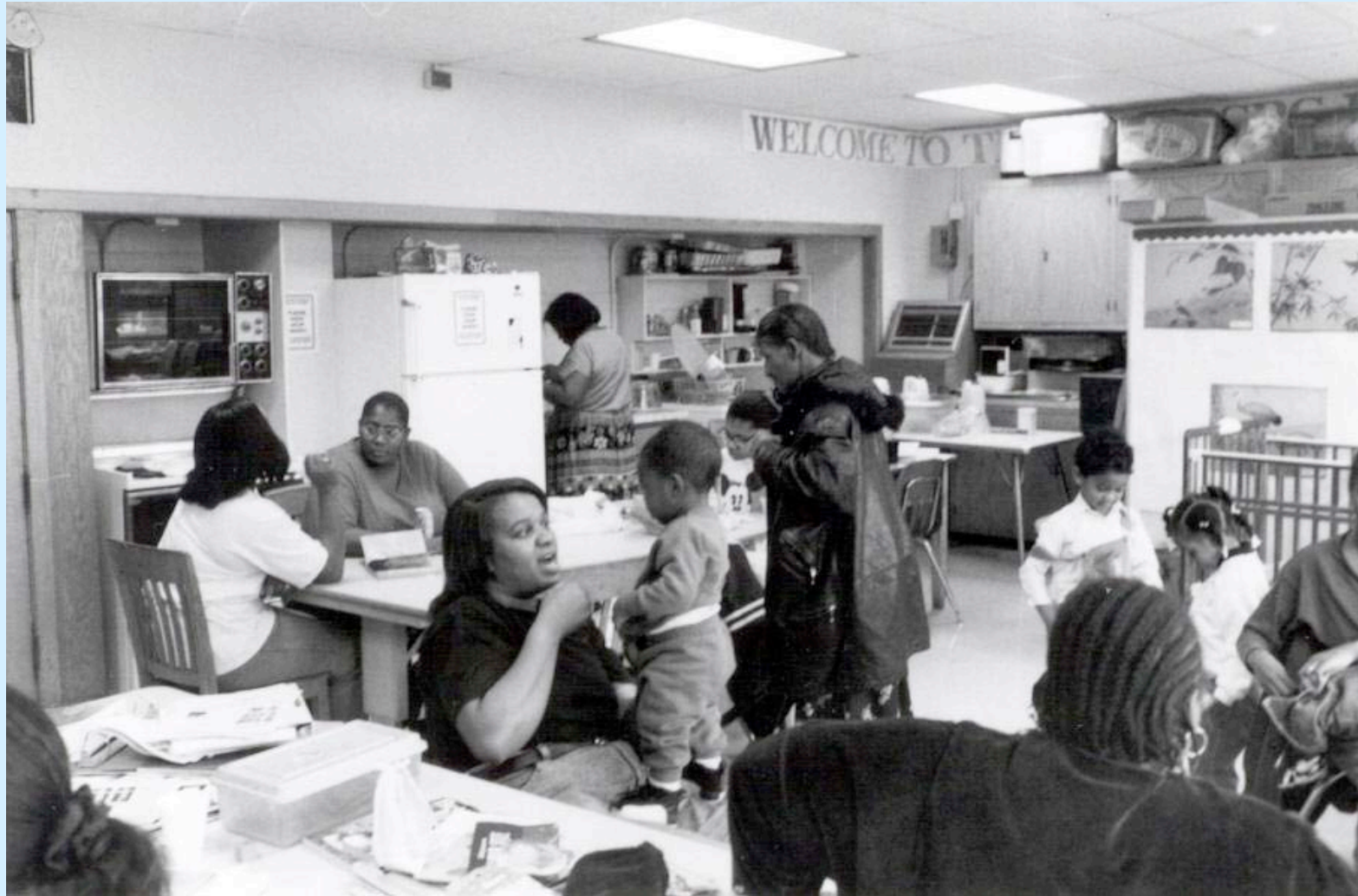
# Johnson Child-Parent Center







# Parent Resource Room



# Major Outcome Measures

Educational Attainment (by age 23)

High school completion, years of education, college attendance

Economic Well Being (22-24)

Quarterly income, employment, in school or working, public aid

Criminal Behavior (18-24)

Arrests, Convictions, Incarceration

Health Status & Behavior (up to 24)

Substance use, teen parenthood, health insurance, child abuse/neglect, health insurance

health insurance

Mental health (22-24)

Depressive symptoms

Outcomes for Parents (by child's age 17) include Educational Attainment, Economic Well Being, and Health

# Sample Sizes and Recovery Rates for Adult Follow Up

Outcome measure assessed at ages 22-24	Number of cases	Recovery rate (%)
Educational attainment	1,368	88.9
Employment status	1,249	81.2
Arrest status/Incarceration history	1,418	92.1
Substance use/Mental health (self report)	1,142	76.4
Health insurance (self report/admin records)	1,277	85.5
Public aid history	1,315	88.0
Parental ed attainment/employment	1,438	93.9
Parental public aid participation	1,440	94.1

# Basic Impact Model

## **CPC participation**

Preschool (1-2 yrs. vs all others)

School-age (1-3 yrs. vs all others)

*Or* Extended (4-6 vs 0-3 yrs.)

## **Covariates** (age 0 to 3)

- A. Sex of child, race/ethnicity, 8 risk indicators, child maltreatment report
- B. Risk Index instead of individual indicators
- C. With and without program sites.

## Design Strengths

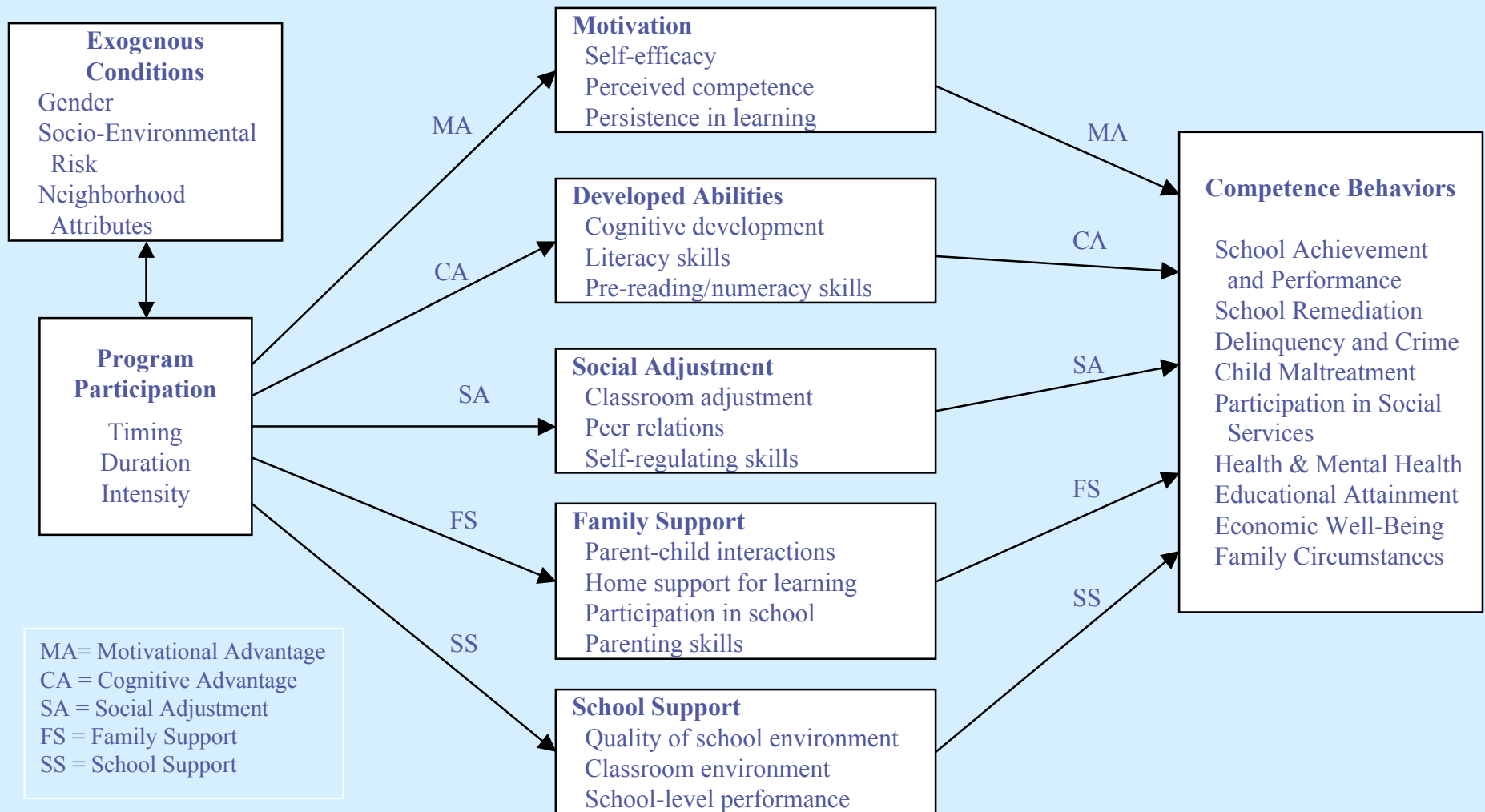
- ◆ Comparison group enrolled in full-day kindergarten, the usual program for at-risk young children at the time
- ◆ Most of comparison group from randomly selected schools with full-day kindergarten.
- ◆ CPCs were in most disadvantaged areas.
- ◆ High rates of CPC enrollment across communities given outreach, low availability of programs, and low-SES status of families.
- ◆ Robustness testing over a decade shows consistency of measured impacts.

# Common Paths from Early Childhood to Adult Well-Being

**Early Childhood**  
Ages 3-9

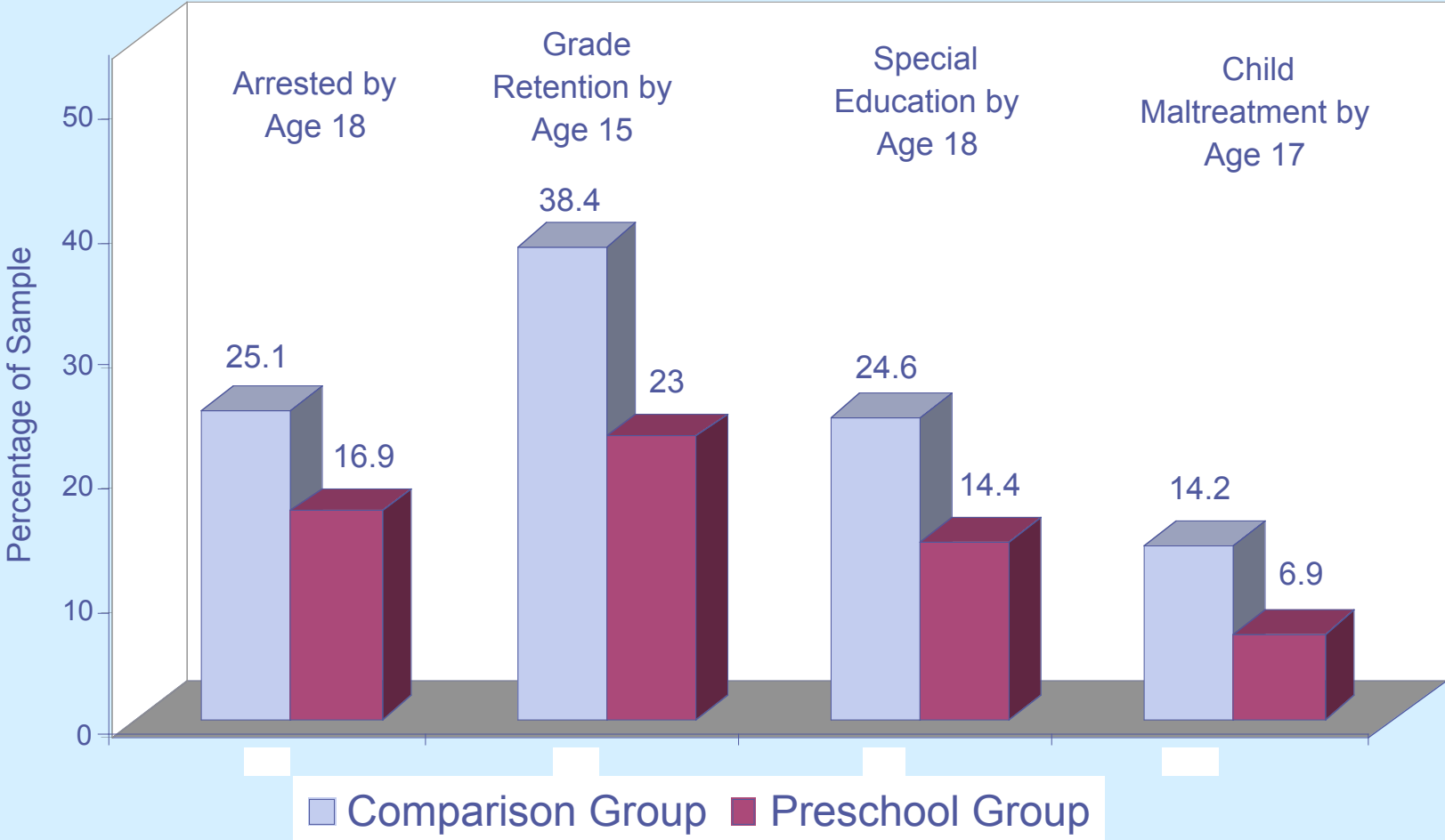
**Ages 5-12**

**Adolescence to Adulthood**



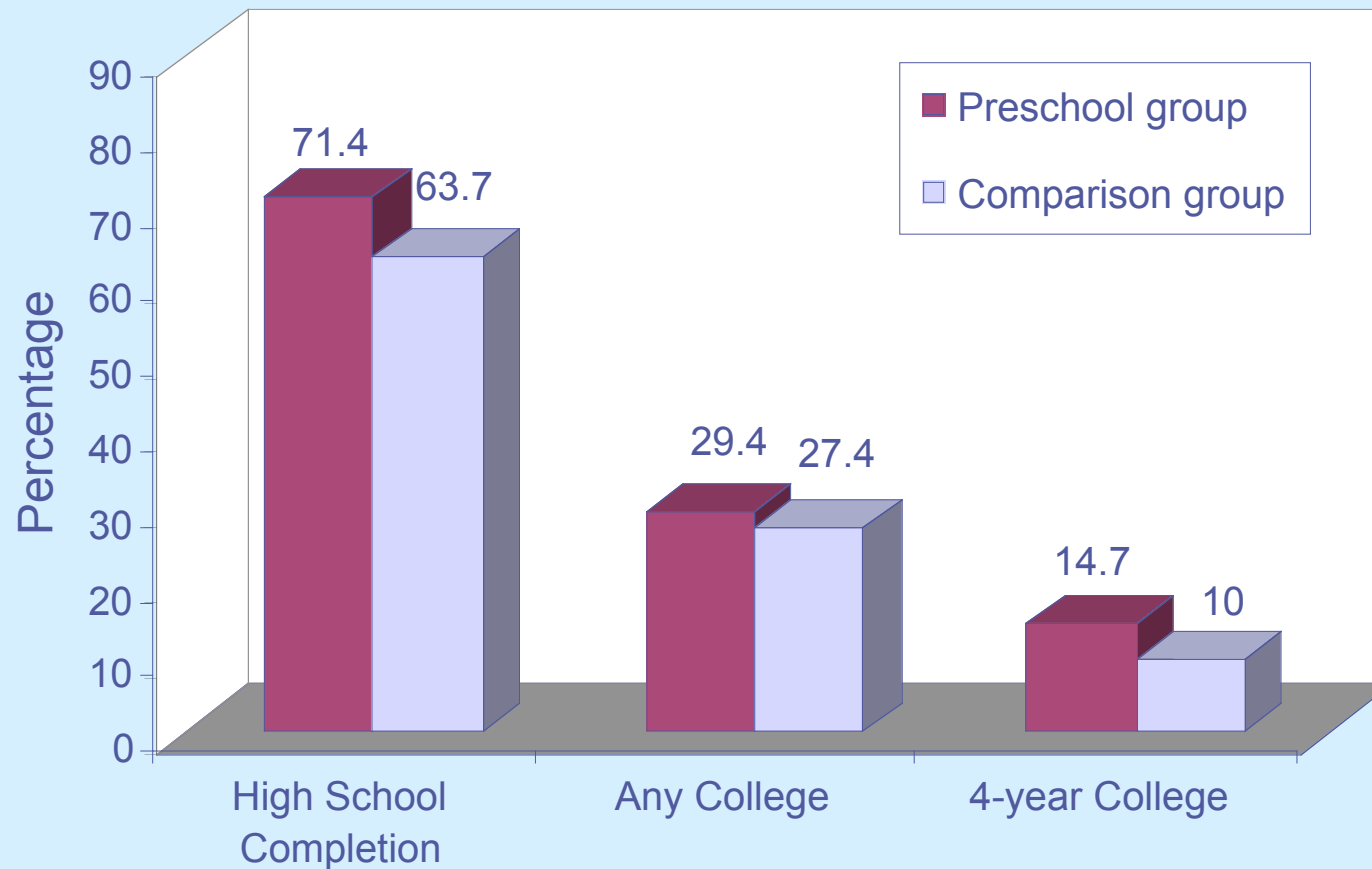
# Major Findings

# Group Differences for Measures of Well Being

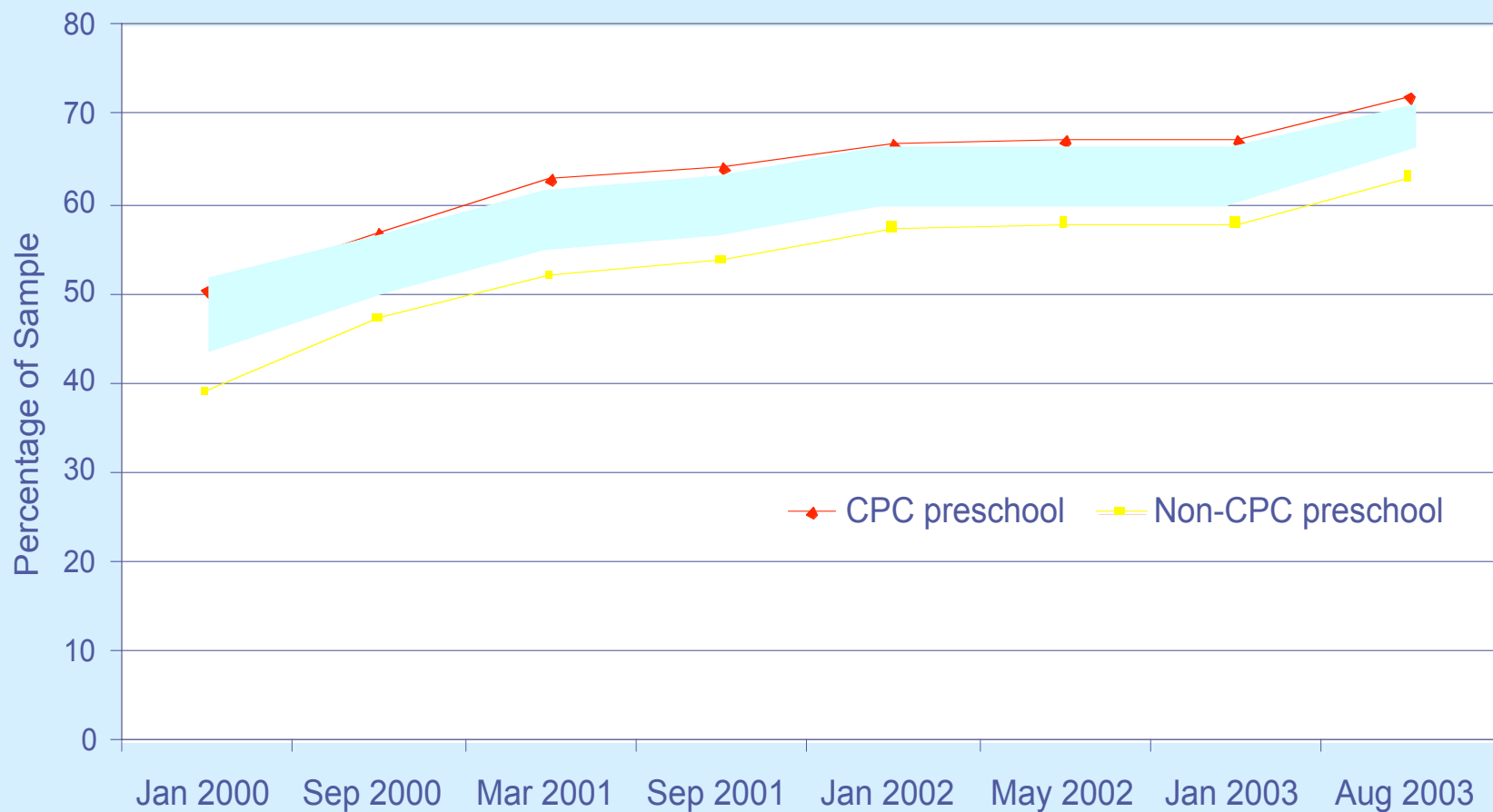




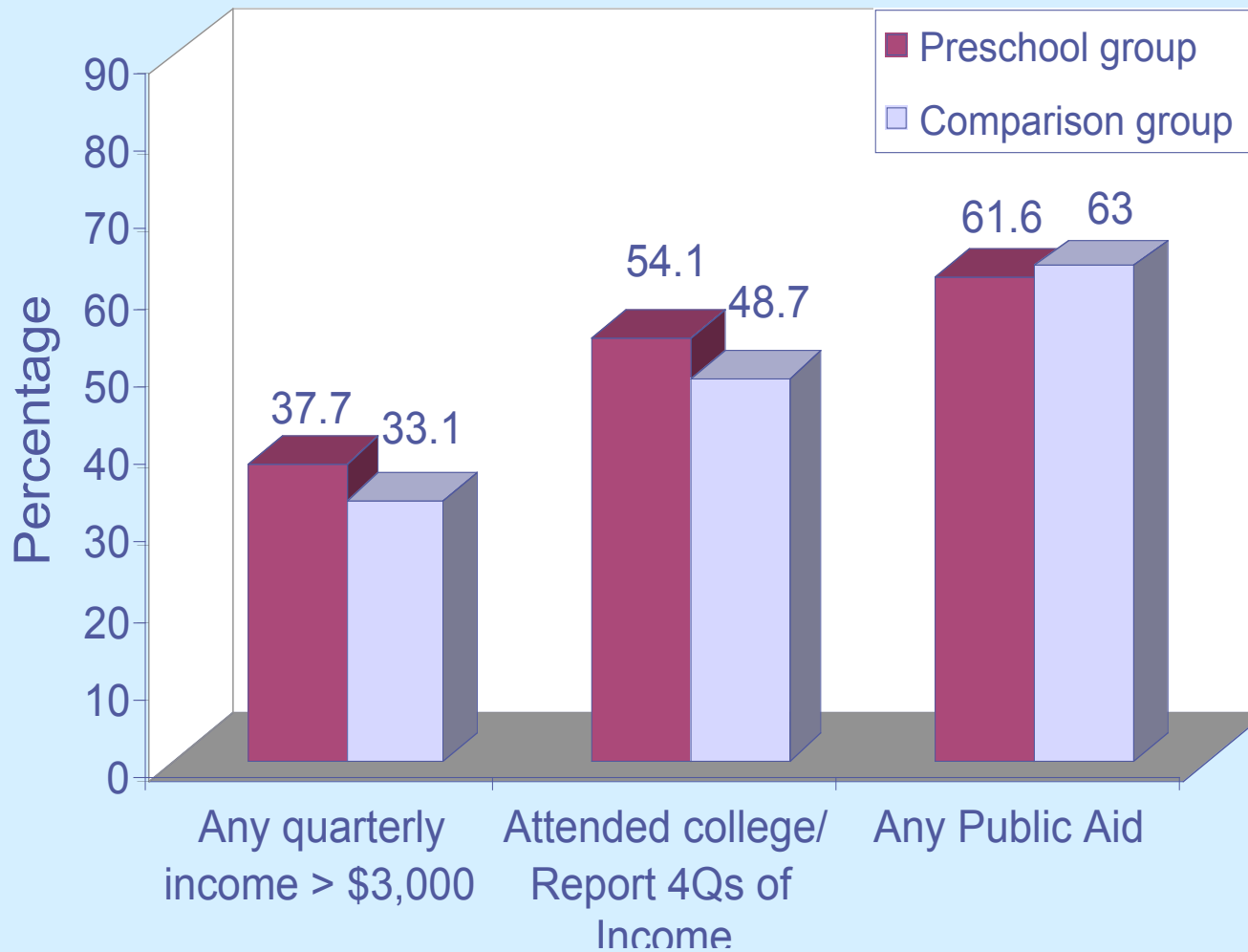
# Educational Attainment by Age 23



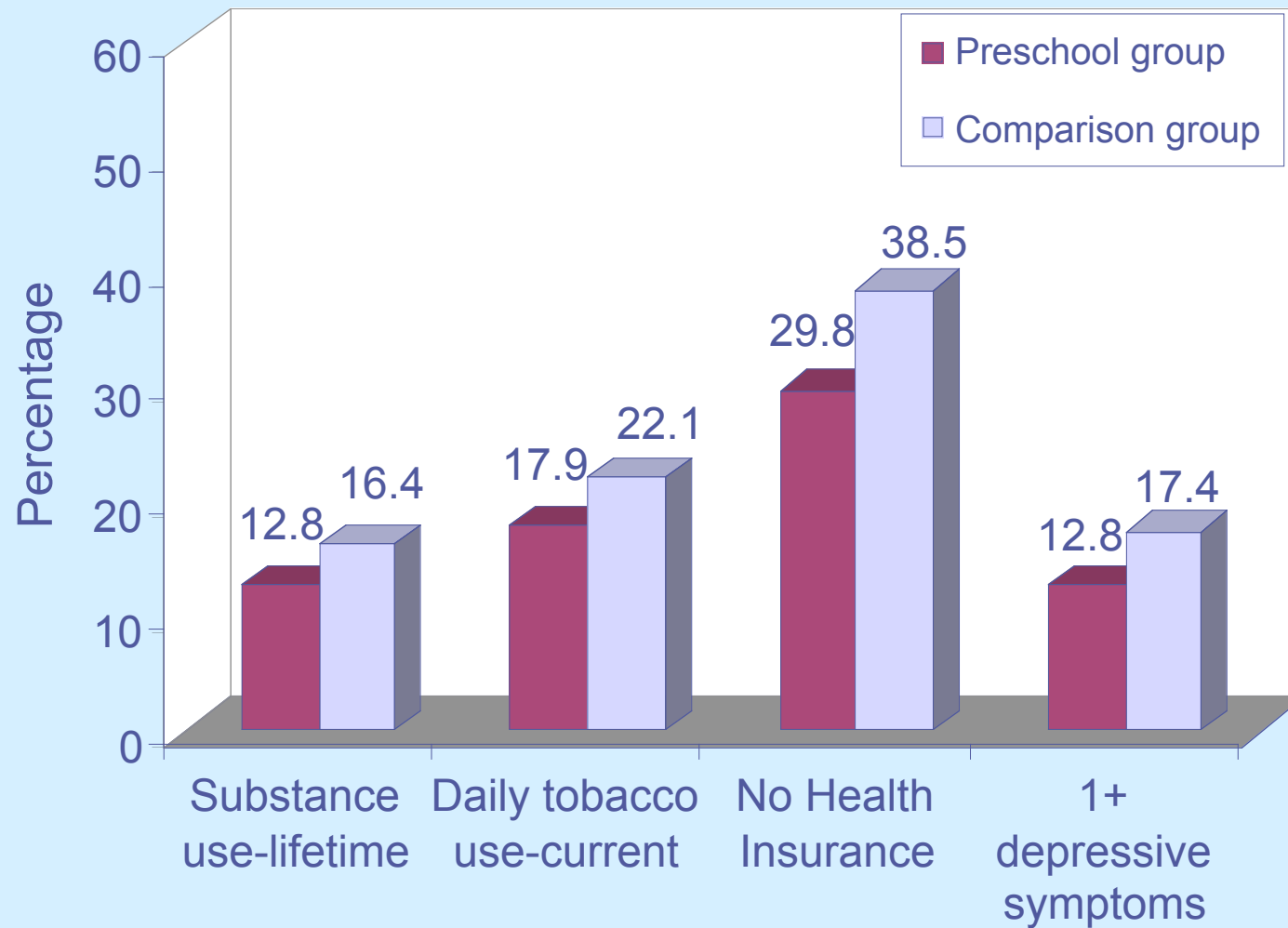
# High School Completion Over Time



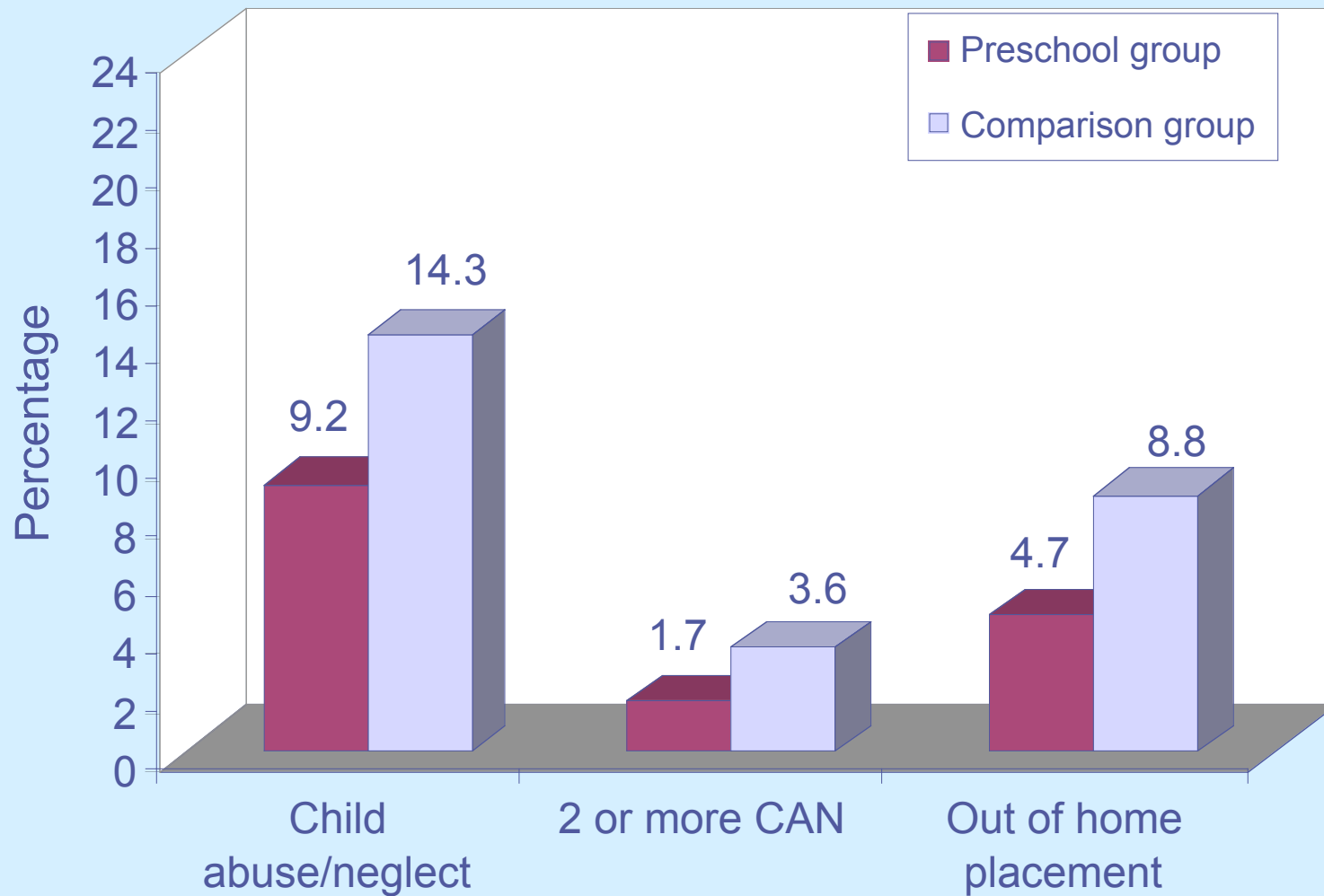
# Economic Well-Being



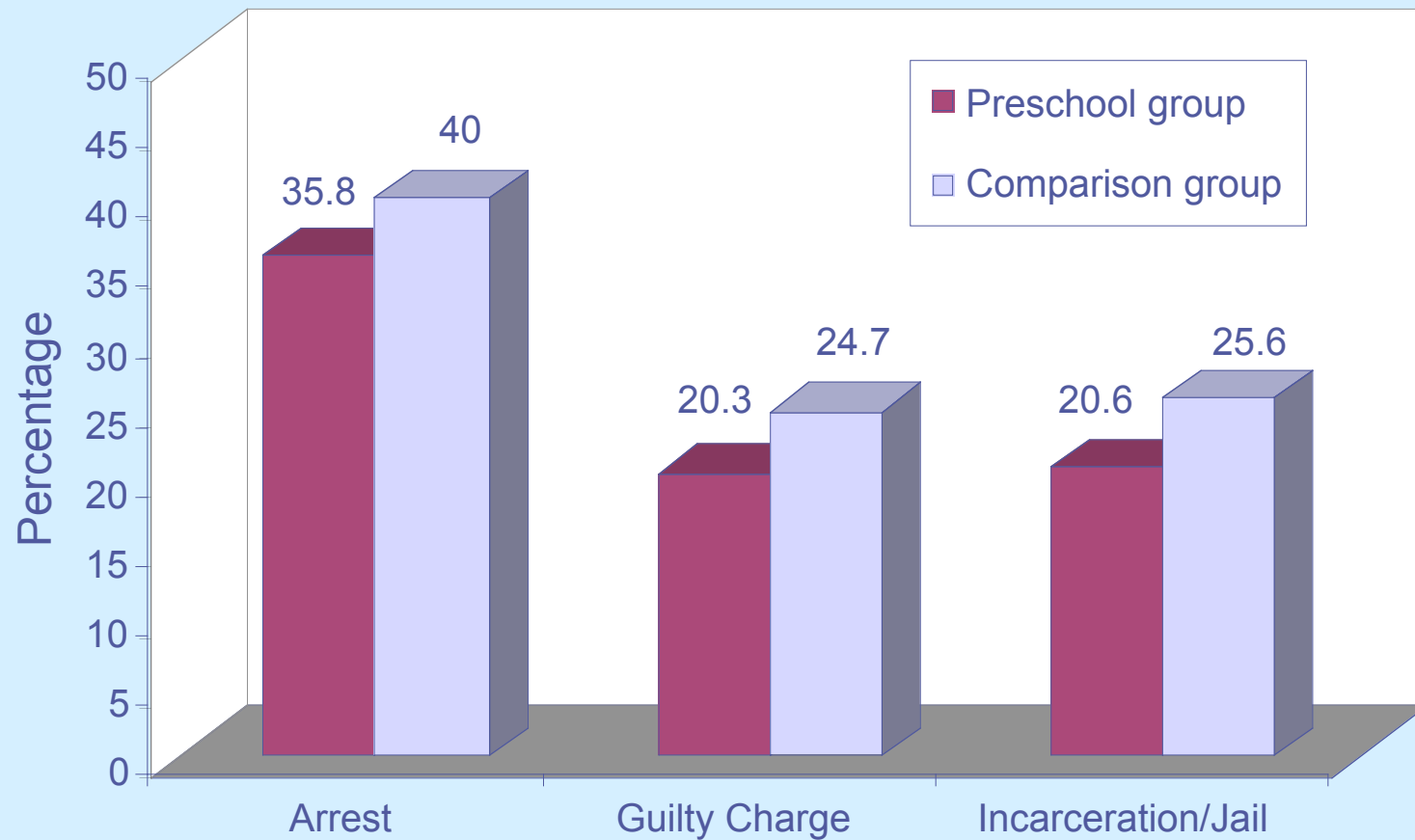
# Health-Related Outcomes



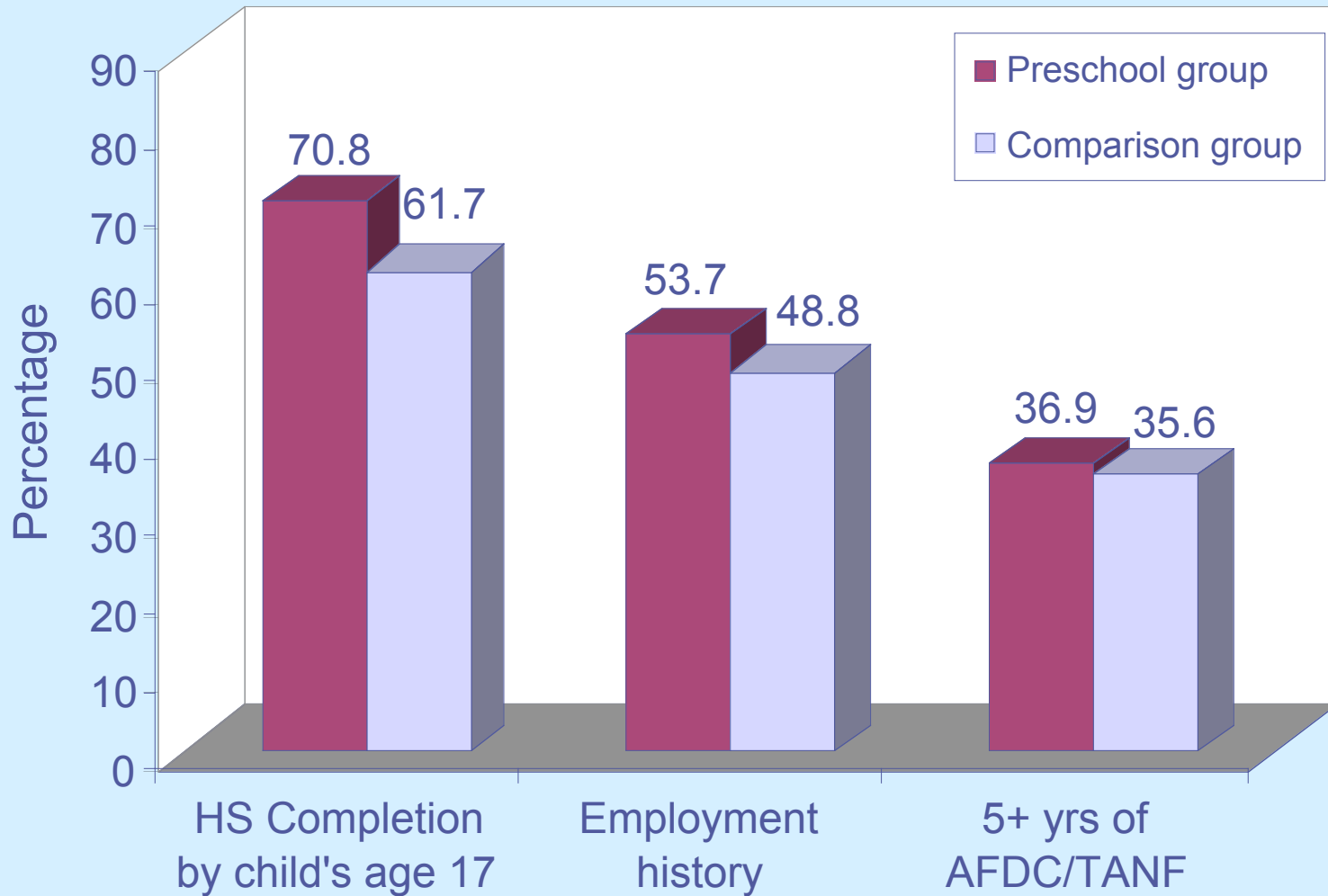
# Child Maltreatment



# Adult Arrest and Incarceration



# Parental Well-Being (Selected)

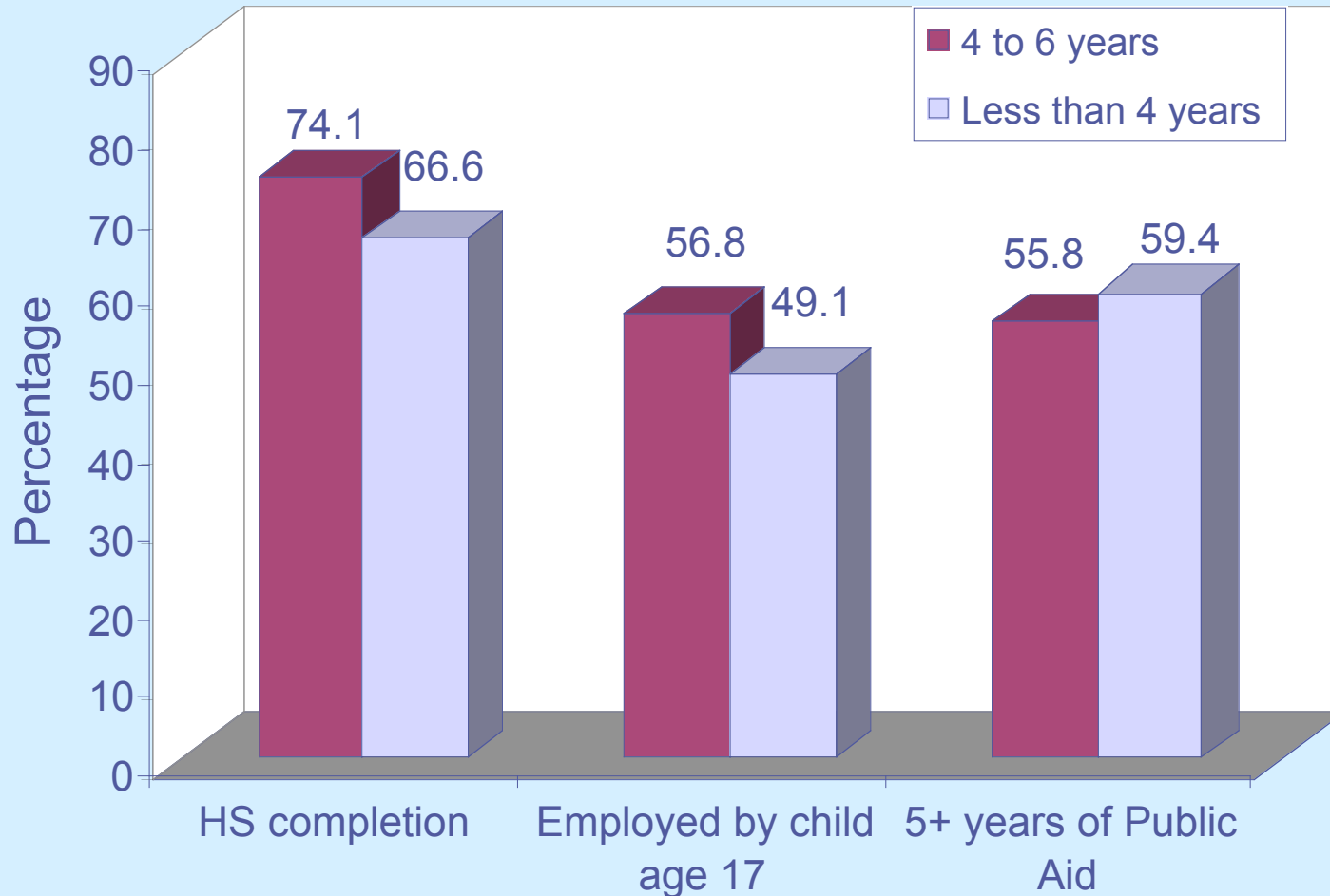


# Extended Intervention Comparisons





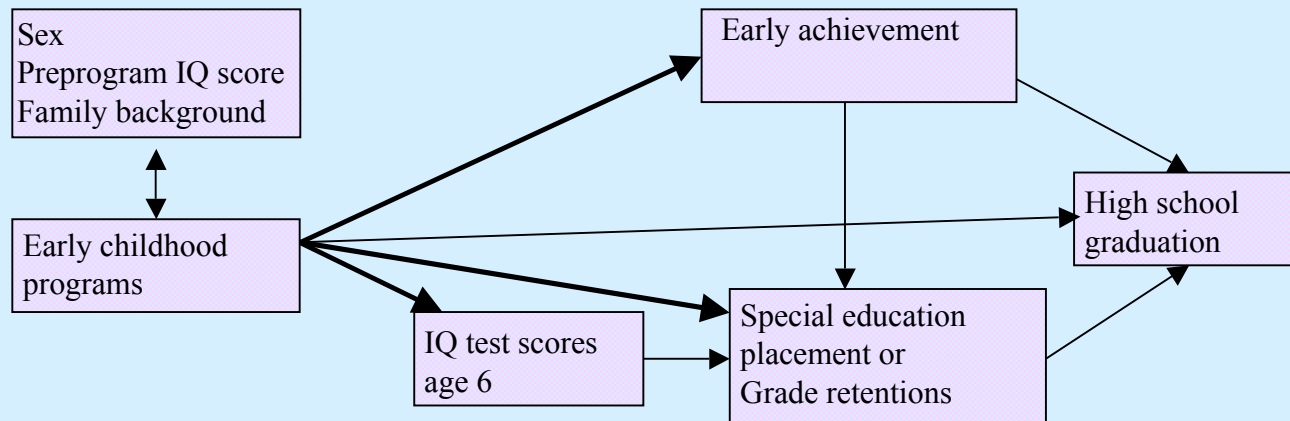
# Parental Well-Being: Extended Intervention



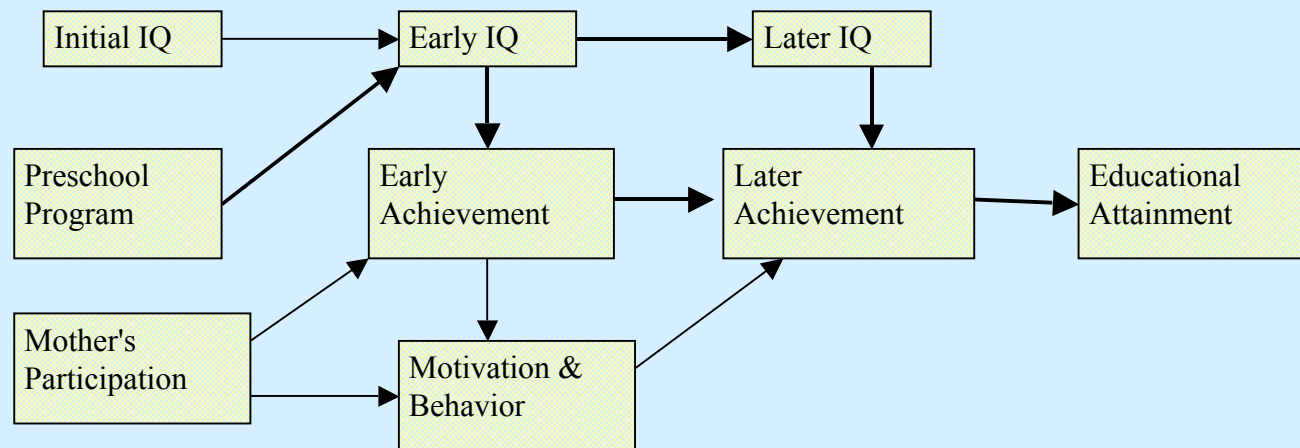
# Summary of Findings

- ◆ Consistent Evidence of Preschool Effects on Educational Attainment
- ◆ New Evidence Linking Preschool to Adult Health Behaviors, Mental Health, and Reductions in Crime.
- ◆ Parents of Program Participants have greater Educational Attainment and Higher Rates of Employment.
- ◆ Extended Intervention Linked to some Adult Outcomes but School-age Intervention did not.

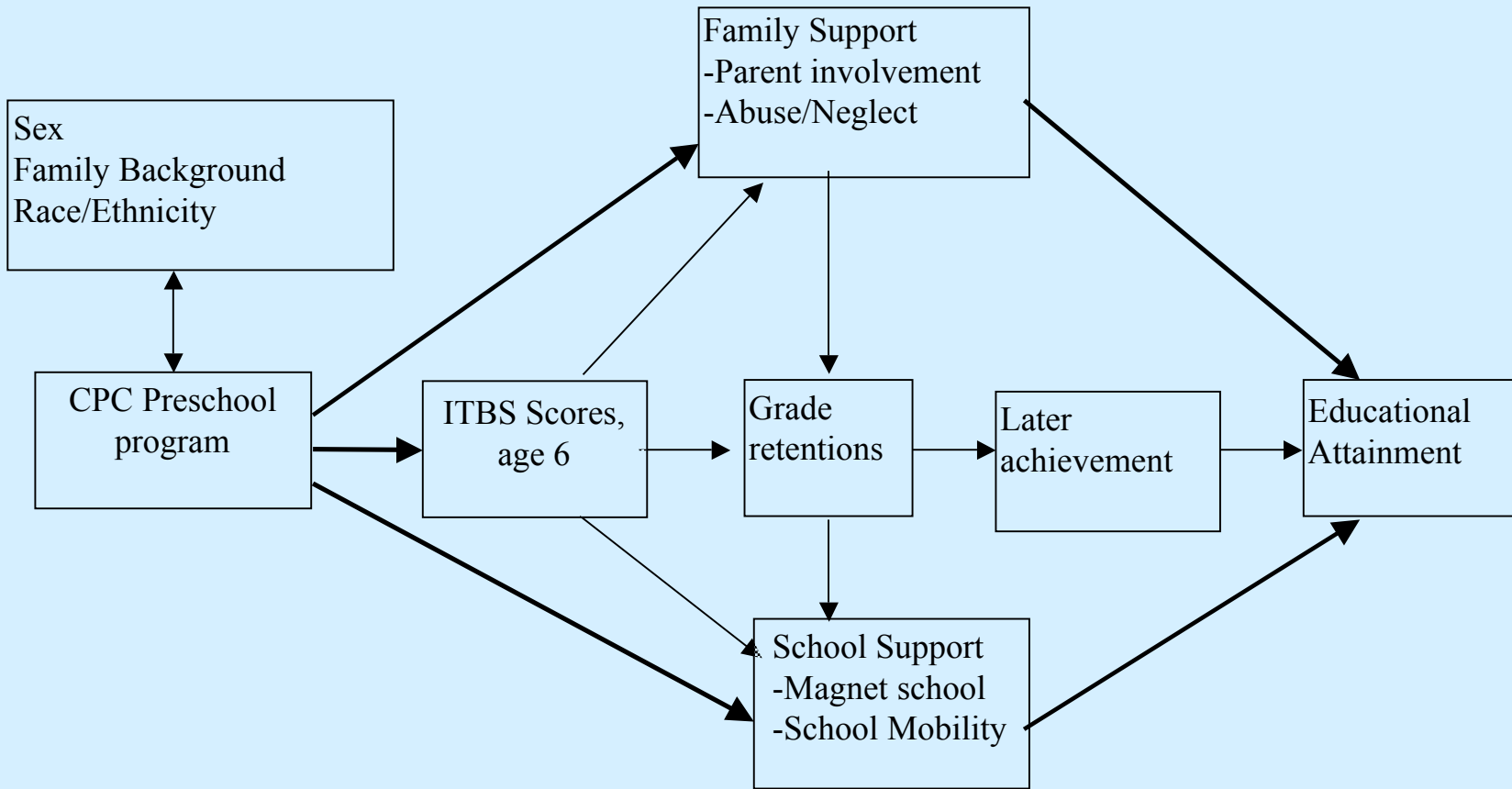
## Paths of Long-term Preschool Effects in Three Studies



Sources of Long-term Effects from the Consortium for Longitudinal Studies (1983)



Sources of Long-term Effects from Perry Preschool (Barnett et al., 1998)



Sources of Long-term Effects from the CPC Program

# Emerging Evidence of Positive Effects of Early Education

- ◆ High Quality Child Care is Linked to School Readiness, Social Skills, and Achievement
- ◆ State Funded Preschool Programs have Positive Effects on Children's Learning  
--e.g., Georgia and Oklahoma
- ◆ Effects of Early Education Exceed Those of Other Programs

# Cost-Benefit Analysis

# Overview

- ◆ Obtain treatment effects and translate them to monetary values
- ◆ Discount future benefits and costs to get their Present Value
- ◆ Projections of future earnings and crime

The economic focus on worker productivity and crime reduction has wide appeal.

- ◆ Numerous reports have been written by child advocacy groups and business councils outlining the economic case for spending on preschool.
- ◆ Investments in preschool generate positive externalities, suggesting that public subsidy is needed.
- ◆ Investments in preschool are now being described as an economic development policy for states



# Major Benefit Categories

- ◆ School Remedial Services
  - *Reduced Costs of Special Education Services*
  - *Reduced Expenditures for Extra Schooling for Retained Students*
- ◆ Child Welfare System
  - *Reduced Treatment and Administrative Costs*
  - *Cost savings to Victims*
- ◆ Justice Systems (Juvenile and Adult)
  - *Reduced Administrative Costs*
  - *Reduced Costs of Treatment and Incarceration*
  - *Savings to Crime Victims*
- ◆ Economic Well-Being (Ed att. and Income)
  - *Increased Earnings to Age 65*
  - *Increased Tax Revenues to Governments*
- ◆ Health Status and Behavior
  - *Reduced Costs of Treatment and Medical Services*

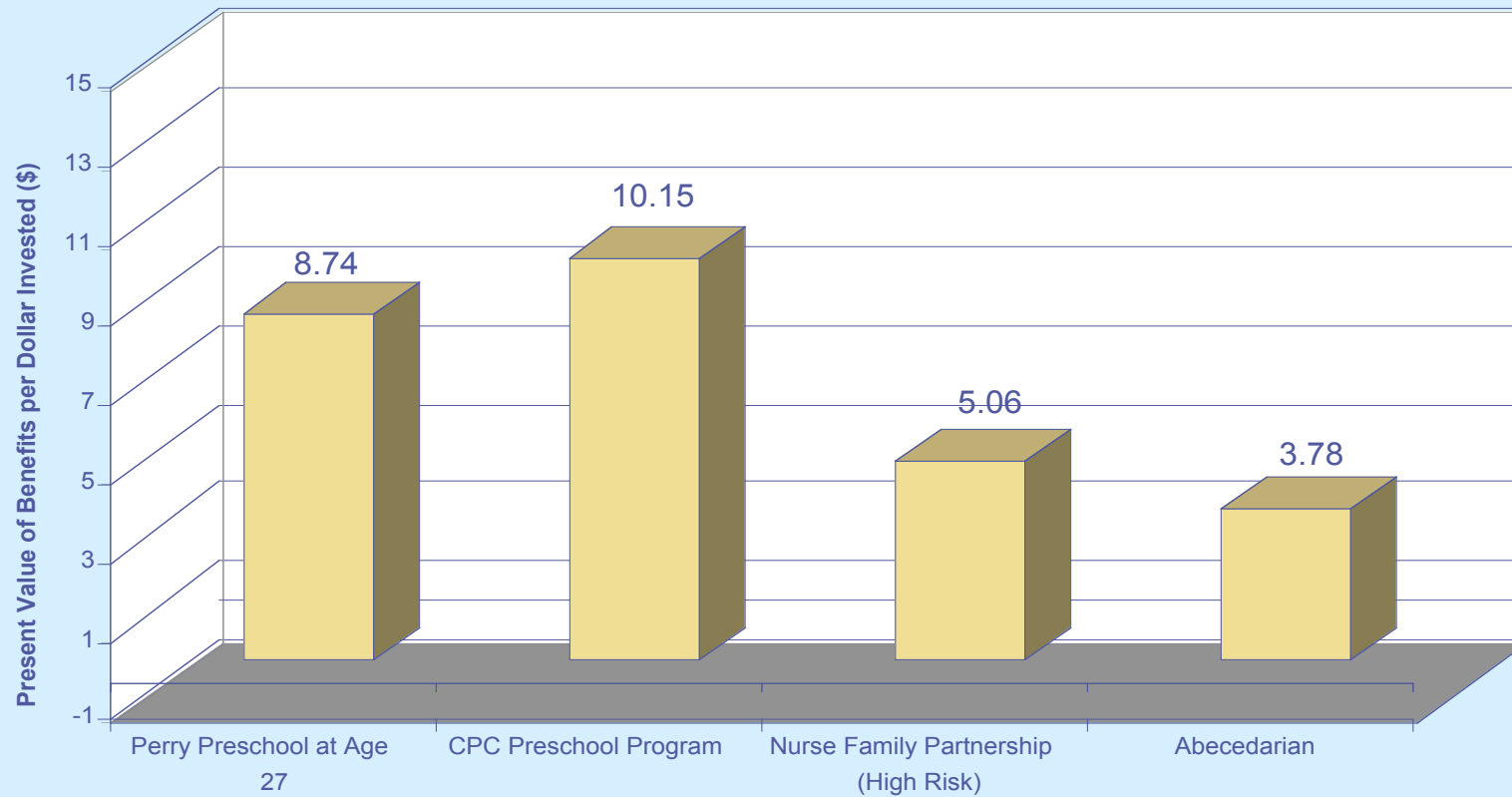
## Total Costs Per Person of Select Outcomes in CBA (2002 dollars)

Outcome	Cost No discount
Sp ed history-K to 12	\$42,995
Maltreatment Victim	\$53,313
Juvenile crime	108,631
Adult crime	391,645
HS completion vs No	\$426,188

## Summary of Costs and Benefits Per Participant in 2002 Dollars for Three Preschool Programs

Costs and Benefits	High/Scope Perry Preschool	Chicago Child- Parent Centers	Abecedarian Project
<b>Program Costs Per Participant</b>			
Average program participant	15,844	7,384	35,894
For one year of participation	9,759	4,856	13,900
<b>Summary of Benefits</b>			
Total benefits	138,486	74,981	135,546
Net benefits (benefits-costs)	122,642	67,595	99,682
Total benefit per dollar invested	8.74	10.15	3.78
Public benefit per dollar invested	7.16	6.87	2.69

# Benefit-Cost Ratios for Total Benefit of 4 Programs



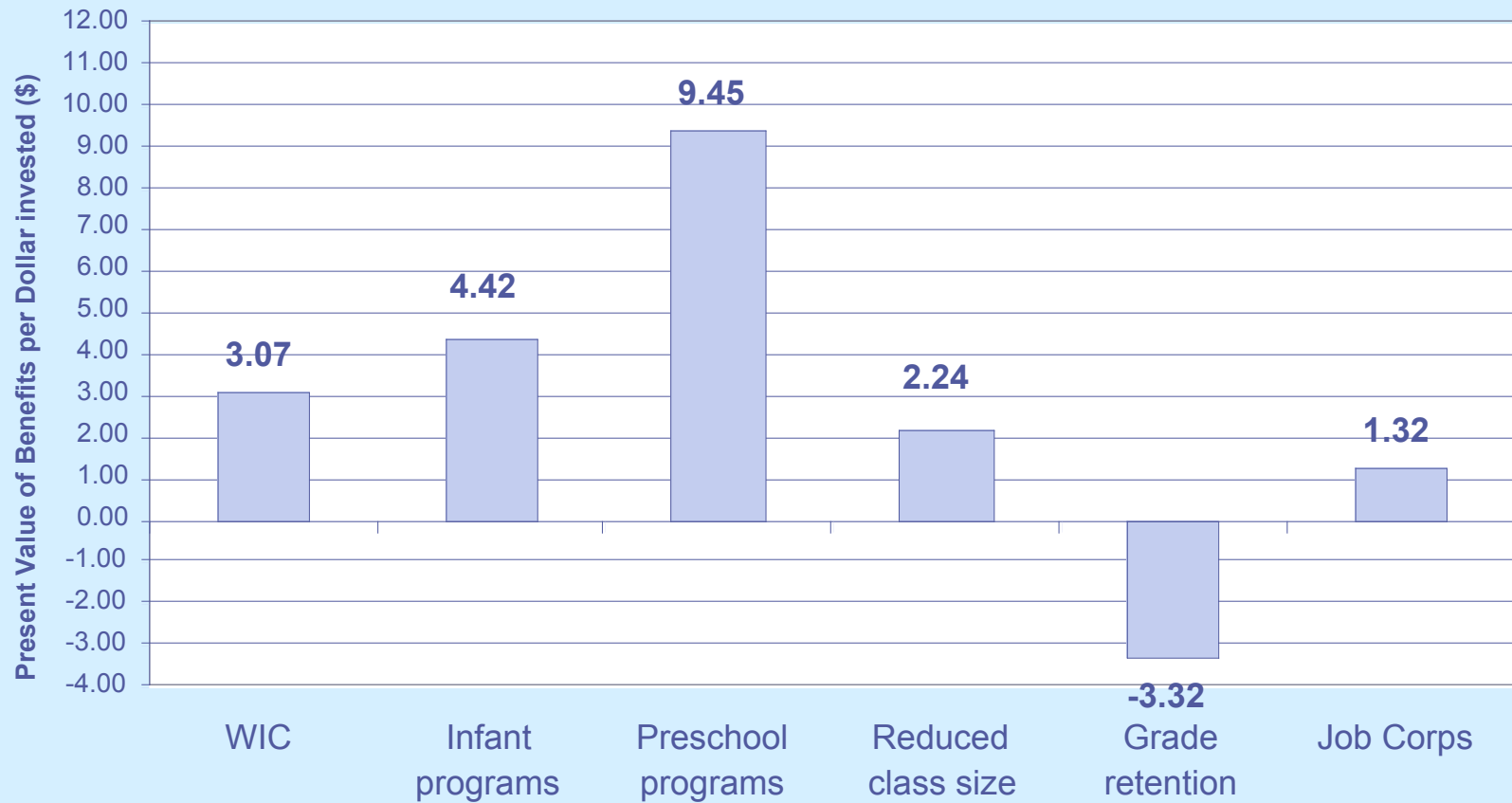
# Economic Returns of Child Programs

Program	Return per dollar invested	Net Benefit (B minus C)
WIC	\$3.07	\$1,983
CPC	\$10.15	\$70,977
Perry	\$8.74/\$17.07	\$128,766/ \$267,347
Nurse Family P	\$5.06	\$29,717
Abecedarian	\$3.78	\$99,682

## Economic Returns (Continued)

Program	Return per dollar invested	Net Benefit (B minus C)
Reduced class sizes	\$2.83	\$15,459
Grade retention	-\$3.32	-\$18,475
Big Brothers/ Big Sisters	\$1.01	\$49
Job Corps	\$1.32	\$4,817

# Benefit-Cost Ratios for Alternative Programs



# Some Next Steps

1. Continued Follow Up of Sample to Age 30
2. Identify Early Predictors and Paths of Influence for Adult Health and Well Being
3. Replication of CPC program in Other Settings
4. Joint Analysis of Preschool Programs to Assess Cost-Effectiveness, Key Elements, and Causal Mechanisms
5. Comparative Analysis of Different Childhood Investments
6. Assessing Strengths and Limits of Different Structures of Early Education Programs.
7. Feasibility of Early Education as part of PK-3



# Conclusions and Implications

1. Established large-scale programs can impact well-being into adulthood; generalizability of findings on early intervention is strengthened.
2. Although timing and length of intervention matter, preschool participation is associated with a wider range of outcomes over longer periods.
3. Impacts are Similar for Most Children.
4. Early childhood programs are among the most effective and cost-effective interventions. A critical mass of evidence supports the effectiveness and cost-effectiveness of high quality programs.

# Implications (cont.)

5. Key elements of effectiveness are timing and length, organizational structure, teacher background and compensation, the enrichment focus on school readiness, and intensive parent program within a comprehensive model.
6. Paths to long-term effects are complex but the largest contributions are from the cognitive advantage, school & family support models.
7. The success of universal programs will depend on (i) following core principles of effectiveness, (ii) recruiting and keeping well-trained staff, and (iii) tailoring services to needs of families.

# For more information about the Chicago Longitudinal Study, contact:

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