



LABOR AND POPULATION

THE ARTS
CHILD POLICY
CIVIL JUSTICE
EDUCATION
ENERGY AND ENVIRONMENT
HEALTH AND HEALTH CARE
INTERNATIONAL AFFAIRS
NATIONAL SECURITY
POPULATION AND AGING
PUBLIC SAFETY
SCIENCE AND TECHNOLOGY
SUBSTANCE ABUSE
TERRORISM AND
HOMELAND SECURITY
TRANSPORTATION AND
INFRASTRUCTURE
WORKFORCE AND WORKPLACE

This PDF document was made available from www.rand.org as a public service of the RAND Corporation.

[Jump down to document ▼](#)

The RAND Corporation is a nonprofit research organization providing objective analysis and effective solutions that address the challenges facing the public and private sectors around the world.

Support RAND

[Purchase this document](#)

[Browse Books & Publications](#)

[Make a charitable contribution](#)

For More Information

Visit RAND at www.rand.org

Explore [RAND Labor and Population](#)

View [document details](#)

Limited Electronic Distribution Rights

This document and trademark(s) contained herein are protected by law as indicated in a notice appearing later in this work. This electronic representation of RAND intellectual property is provided for non-commercial use only. Unauthorized posting of RAND PDFs to a non-RAND Web site is prohibited. RAND PDFs are protected under copyright law. Permission is required from RAND to reproduce, or reuse in another form, any of our research documents for commercial use. For information on reprint and linking permissions, please see [RAND Permissions](#).

Report Documentation Page			Form Approved OMB No. 0704-0188		
Public reporting burden for the collection of information is estimated to average 1 hour per response, including the time for reviewing instructions, searching existing data sources, gathering and maintaining the data needed, and completing and reviewing the collection of information. Send comments regarding this burden estimate or any other aspect of this collection of information, including suggestions for reducing this burden, to Washington Headquarters Services, Directorate for Information Operations and Reports, 1215 Jefferson Davis Highway, Suite 1204, Arlington VA 22202-4302. Respondents should be aware that notwithstanding any other provision of law, no person shall be subject to a penalty for failing to comply with a collection of information if it does not display a currently valid OMB control number.					
1. REPORT DATE 2009		2. REPORT TYPE final		3. DATES COVERED 00-00-2009 to 00-00-2009	
4. TITLE AND SUBTITLE Preschool adequacy and efficiency in California issues, policy options, and recommendations			5a. CONTRACT NUMBER		
			5b. GRANT NUMBER		
			5c. PROGRAM ELEMENT NUMBER		
6. AUTHOR(S) Lynn Karoly			5d. PROJECT NUMBER		
			5e. TASK NUMBER		
			5f. WORK UNIT NUMBER		
7. PERFORMING ORGANIZATION NAME(S) AND ADDRESS(ES) RAND Corporation,1776 Main Street,Santa Monica,CA,90407			8. PERFORMING ORGANIZATION REPORT NUMBER MG-889-PF/WKKE/PEW/NIEER		
9. SPONSORING/MONITORING AGENCY NAME(S) AND ADDRESS(ES)			10. SPONSOR/MONITOR'S ACRONYM(S)		
			11. SPONSOR/MONITOR'S REPORT NUMBER(S)		
12. DISTRIBUTION/AVAILABILITY STATEMENT Approved for public release; distribution unlimited					
13. SUPPLEMENTARY NOTES Online access http://www.rand.org/pubs/monographs/MG889/					
14. ABSTRACT Facing mounting evidence that California has fallen behind on many key indicators of educational performance, policymakers and the public share considerable interest in exploring whether California should expand public funding for preschool education. This expanded funding will be most effective if resources can be directed to their most efficient uses. Doing so requires an understanding of how resources are currently allocated, what educational objectives preschool education can help achieve, and where preschool resources can be most effective. To investigate these issues, the RAND Corporation undertook a multicomponent study called the California Preschool Study to examine the adequacy and efficiency of preschool education in California. Researchers completed three studies to advance knowledge of (1) gaps in school readiness and achievement in the early grades among California children and the potential for high-quality preschool programs to close existing gaps, (2) the use of early care and education (ECE) services among California's children and the quality of those experiences, and (3) the system of publicly funded ECE programs in California in the two years before kindergarten entry. The objective of this analysis, the fourth and final study component, is to integrate the results from the series of studies, as well as relevant prior research, and make recommendations to advance preschool adequacy and efficiency in California.					
15. SUBJECT TERMS					
16. SECURITY CLASSIFICATION OF:			17. LIMITATION OF ABSTRACT Same as Report (SAR)	18. NUMBER OF PAGES 194	19a. NAME OF RESPONSIBLE PERSON
a. REPORT unclassified	b. ABSTRACT unclassified	c. THIS PAGE unclassified			

This product is part of the RAND Corporation monograph series. RAND monographs present major research findings that address the challenges facing the public and private sectors. All RAND monographs undergo rigorous peer review to ensure high standards for research quality and objectivity.

Preschool Adequacy and Efficiency in California

Issues, Policy Options, and Recommendations

Lynn A. Karoly

Supported by the David and Lucile Packard Foundation, the W. K. Kellogg Foundation, the Pew Charitable Trusts through the National Institute for Early Education Research (NIEER), the W. Clement and Jessie V. Stone Foundation, and Los Angeles Universal Preschool

Approved for public release; distribution unlimited



LABOR AND POPULATION

The research described in this report was conducted by RAND Labor and Population. Funding was provided by the David and Lucile Packard Foundation, the W. K. Kellogg Foundation, the Pew Charitable Trusts through the National Institute for Early Education Research (NIEER), the W. Clement and Jessie V. Stone Foundation, and Los Angeles Universal Preschool.

Library of Congress Cataloging-in-Publication Data is available for this publication.

978-0-8330-4743-4

The RAND Corporation is a nonprofit research organization providing objective analysis and effective solutions that address the challenges facing the public and private sectors around the world. RAND's publications do not necessarily reflect the opinions of its research clients and sponsors.

RAND® is a registered trademark.

© Copyright 2009 RAND Corporation

Permission is given to duplicate this document for personal use only, as long as it is unaltered and complete. Copies may not be duplicated for commercial purposes. Unauthorized posting of RAND documents to a non-RAND Web site is prohibited. RAND documents are protected under copyright law. For information on reprint and linking permissions, please visit the RAND permissions page (<http://www.rand.org/publications/permissions.html>).

Published 2009 by the RAND Corporation

1776 Main Street, P.O. Box 2138, Santa Monica, CA 90407-2138

1200 South Hayes Street, Arlington, VA 22202-5050

4570 Fifth Avenue, Suite 600, Pittsburgh, PA 15213-2665

RAND URL: <http://www.rand.org>

To order RAND documents or to obtain additional information, contact

Distribution Services: Telephone: (310) 451-7002;

Fax: (310) 451-6915; Email: order@rand.org

Preface

Faced with mounting evidence that California has fallen behind on many key indicators of education performance, policymakers and the public share considerable interest in exploring whether California should expand public funding for preschool education. This expanded funding will be most effective if resources can be directed to their most efficient uses. Doing so requires an understanding of how resources are currently allocated, what education objectives preschool education can help achieve, and where preschool resources can be most effective.

To investigate these issues, the RAND Corporation has undertaken a multicomponent study called the California Preschool Study to examine the adequacy and efficiency of preschool education in California. The overall study effort seeks to address four overarching questions:

- What are the overall and cross-group achievement gaps for California's children in terms of the state's kindergarten through third grade (K–3) education standards, and what is the potential for high-quality preschool programs to raise achievement?
- How adequate is the quality of preschool education that California children are receiving, and what proportion of families have access to high-quality preschool that would be expected to produce the cognitive, social, and emotional benefits necessary to help children achieve the state's early-elementary standards?
- What efficiencies can be obtained in the current system of funding for early care and education (ECE) programs serving children

one or two years before kindergarten entry in order to improve K–3 education outcomes?

- What additional ECE policies or resources would be required to ensure that all children in California are prepared to meet K–3 standards?

To address these questions, three interrelated studies have already been completed that were designed to advance our knowledge base regarding (1) gaps in school readiness and achievement in the early grades among California children and the potential for high-quality preschool programs to close existing gaps, (2) the use of ECE services among California’s children and the quality of those experiences, and (3) the system of publicly funded ECE programs in California in the two years before kindergarten entry. The objective of this analysis, which is the fourth and final study component, is to integrate the results from the three focused studies, as well as relevant prior research, to address the four broader issues related to preschool adequacy and efficiency just listed.

This study component should be of interest to policymakers, researchers, and educators who are interested in policy issues related to the adequacy and efficiency of preschool education in California and in other states.

Results for the other study components can be found in the following:

- Jill S. Cannon and Lynn A. Karoly, *Who Is Ahead and Who Is Behind? Gaps in School Readiness and Student Achievement in the Early Grades for California’s Children*, Santa Monica, Calif.: RAND Corporation, TR-537-PF/WKKF/PEW/NIEER/WCJVSF/LAUP, 2007b
- Jill S. Cannon and Lynn A. Karoly, *The Promise of Preschool for Narrowing Readiness and Achievement Gaps Among California Children*, Santa Monica, Calif.: RAND Corporation, RB-9306-PF/WKKF/PEW/NIEER/WCJVSF/LAUP, 2007a
- Lynn A. Karoly, Elaine Reardon, and Michelle Cho, *Early Care and Education in the Golden State: Publicly Funded Pro-*

grams Serving California's Preschool-Age Children, Santa Monica, Calif.: RAND Corporation, TR-538-PF/WKKF/PEW/NIEER/WCJVSF/LAUP, 2007a

- Lynn A. Karoly, Elaine Reardon, and Michelle Cho, *Publicly Funded Early Care and Education Programs for California Preschool-Age Children*, Santa Monica, Calif.: RAND Corporation, RB-9307-PF/WKKF/PEW/NIEER/WCJVSF/LAUP, 2007b
- Lynn A. Karoly, Bonnie Ghosh-Dastidar, Gail L. Zellman, Michal Perlman, and Lynda Fernyhough, *Prepared to Learn: The Nature and Quality of Early Care and Education for Preschool-Age Children in California*, Santa Monica, Calif.: RAND Corporation, TR-539-PF/WKKF/PEW/NIEER/WCJVSF/LAUP, 2008a
- Lynn A. Karoly, Bonnie Ghosh-Dastidar, Gail L. Zellman, Michal Perlman, and Lynda Fernyhough, *Room for Improvement in the Use of High-Quality Preschool Programs for California's Children*, Santa Monica, Calif.: RAND Corporation, RB-9358-PF/WKKF/PEW/NIEER/WCJVSF/LAUP, 2008b.

This project was requested by the California Governor's Committee on Education Excellence, the California State Superintendent of Public Instruction, the Speaker of the California State Assembly, and the President pro Tempore of the California State Senate. Funding was provided by the David and Lucile Packard Foundation, the W. K. Kellogg Foundation, the Pew Charitable Trusts through the National Institute for Early Education Research (NIEER), the W. Clement and Jessie V. Stone Foundation, and Los Angeles Universal Preschool (LAUP). The project has been guided by an advisory group of academic researchers, policy experts, and practitioners.

RAND Labor and Population

This research was undertaken within RAND Labor and Population. RAND Labor and Population has built an international reputation for conducting objective, high-quality, empirical research to support and improve policies and organizations around the world. Its work

focuses on labor markets, social welfare policy, demographic behavior, immigration, international development, and issues related to aging and retirement with a common aim of understanding how policy and social and economic forces affect individual decisionmaking and the well-being of children, adults, and families.

For more information on RAND Labor and Population, contact Arie Kapteyn, Director, RAND Labor and Population, RAND Corporation, 1776 Main Street, P.O. Box 2138, Santa Monica, CA 90407-2138, (310) 393-0411 x7973, Arie_Kapteyn@rand.org.

Contents

Preface iii
Figures xi
Tables xiii
Summary xv
Acknowledgments xxxi
Abbreviations xxxiii

CHAPTER ONE

Introduction 1
Preschool Policy Developments in the United States 3
Preschool Policy Developments in California 11
Organization of This Monograph 17

CHAPTER TWO

Adequacy and Efficiency of Preschool Education in California 19
There Are Sizable Deficits in Student Achievement by Second and
 Third Grades and Even Larger Gaps for Some Groups 22
The Achievement Gaps Evident in the Early Elementary Grades Have
 Earlier Roots 25
High-Quality Preschool Can Improve School Readiness and Raise
 Student Achievement, Especially for More-Disadvantaged
 Students 26
Effective Preschool Programs Produce Sizable Effects on School
 Readiness 27
Effective Preschool Programs Sustain Early Benefits Over Time 31

Effective Preschool Programs Promote School Readiness for
Students from Diverse Backgrounds..... 33

Preschool Participation Is the Norm, but High-Quality Preschool,
with Features That Promote School Readiness, Is Not 36

Participation in Center-Based ECE Is the Norm for California
Preschoolers..... 37

Quality Is Mixed in Center-Based Programs..... 38

The Children Who Could Benefit Most Are Less Likely to
Participate in High-Quality Early-Learning Opportunities 42

Publicly Funded ECE Programs in California Are Not Designed to
Achieve Maximum Child Development Benefits 46

The System Is Complex, with Dual Motivations..... 46

The System Is Not Designed to Promote or Reward Quality 49

The System Is Not Funded to Serve All Children Who Are Eligible.... 50

Expanding Access to High-Quality Preschool for Disadvantaged
Children Can Narrow the Achievement Gap..... 52

Analytic Approach and Assumptions..... 53

Effects of Alternative Policy Scenarios on Achievement Levels and
Gaps 59

Summary..... 65

CHAPTER THREE

Design Options for State Preschool Systems 67

Access: Universal Versus Targeted Preschool Programs for One or
Two Years 68

Universal Versus Targeted 68

One Year or Two 75

Determining Eligibility in Targeted Programs and with
Prioritization..... 78

Delivery: Public Providers or Mixed Delivery..... 79

Quality: Regulation, Measurement, and Financial Incentives 82

Infrastructure: Governance, Financing, Information Systems, and
Other Supports 89

CHAPTER FOUR

Recommendations for Preschool Policy in California	93
Using Existing Resources to Create a More Efficient and Coordinated System with Appropriate Infrastructure Supports	95
Access: Ensuring That Children Who Can Benefit Most Are Served First.....	95
Delivery: Reduce Inefficiencies in Contracting Mechanisms and Standardize Reimbursement Structures.....	101
Quality: Build a Foundation for Future Investments	104
Infrastructure: Look to Evidence of Best Practices for More-Effective Support	107
Using New Resources to Expand Access and Raise Quality.....	111
Access: Expand First to Those Who Will Benefit Most.....	111
Quality: Focus on What Matters	119
Infrastructure: Address Supports Needed to Achieve Higher Quality and Expanded Access.....	121

CHAPTER FIVE

Conclusions	123
California Faces Shortfalls in Preschool Adequacy and Efficiency.....	123
Policy Options and Recommendations for Advancing Preschool Adequacy and Efficiency	126
Improving the Efficiency of Existing Resources.....	128
Investing New Resources to Expand Access or Raise Quality	129
Broader Implications.....	131

APPENDIX

Supplement to the Targeting Analysis in Chapter Four	135
References	147

Figures

- 1.1. Publicly Funded ECE Programs Serving Preschool-Age Children in California 15
- 2.1. Percentage Not Proficient in Third Grade, by Student Characteristics: English-Language Arts and Mathematics CST for 2007 24
- 2.2. Effects of Tulsa, Oklahoma, Preschool Program on School Readiness, by Subgroup..... 35
- 2.3. Percentage Distribution of Preschool-Age Children in California Across ECE Arrangement Types 38
- 2.4. Percentage of Preschool-Age Children in California in Center-Based ECE Arrangements in Programs Meeting Quality Benchmarks 40
- 2.5. Percentage of Preschool-Age Children in California in Center-Based ECE Arrangements, by Characteristic..... 43
- 2.6. Preschool-Age Children in California with Largest Achievement and School-Readiness Gaps in High-Quality, Center-Based ECE Programs..... 45
- 3.1. Costs and Benefits of Targeted Versus Universal Preschool Programs..... 71
- 3.2. Costs and Benefits of Preschool Programs Serving Three- and Four-Year-Olds..... 76
- 4.1. Percentage of Preschool-Age Children in California Estimated to Be Eligible for ECE Subsidies Under Alternative Place-Based Targeting Rules, by Income-Eligibility Status..... 115
- 4.2. Percentage of Preschool-Age Children in California Estimated to Be Eligible for ECE Subsidies Under Income or Location Targeting Rules or Both 116

4.3. Percentage of Preschool-Age Children in California
 Estimated to Be Eligible for ECE Subsidies Under
 Place-Based Targeting Rule A, by Income-Eligibility
 Status and Selected Child and Family Characteristics 117

Tables

- S.1. Summary of Policy Recommendations by Domain xxiv
- 1.1. Preschool Policy Domains and Approaches at the State Level 6
- 1.2. Number of States with Preschool Program Delivery Features, as of 2006–2007..... 7
- 1.3. Recommendations Regarding Early-Education Policy from Two California Advisory Bodies 13
- 2.1. Estimated Effects of Preschool Programs on School Readiness 28
- 2.2. Effect Sizes of Perry Preschool and Chicago CPC on Student Achievement in Kindergarten to Third Grade 32
- 2.3. Effect Sizes of Perry Preschool and Chicago CPC on Longer-Term Education Outcomes..... 33
- 2.4. Publicly Funded ECE Programs in California Covered in Study 47
- 2.5. Estimated Gap in Eligibility and Enrollment for Subsidized ECE Programs in California with a Child Development Focus, October 2006 51
- 2.6. Absolute and Relative Achievement-Score Differences, by Race-Ethnicity: 2007 CST in Second- and Third-Grade English-Language Arts and Mathematics..... 54
- 2.7. Assumptions Regarding Effect Sizes from Increase in Preschool Participation or Quality or Both..... 57
- 2.8. Effect of Preschool Policy Changes on Racial-Ethnic Achievement Gaps, Under Alternative Assumptions 60
- 3.1. Potential Trade-Offs Between Targeted and Universal Preschool Programs..... 69

- 3.2. Advantages and Disadvantages of Alternative
Approaches to Promoting Quality..... 86
- 3.3. Relationship Between Infrastructure Supports and Access,
Delivery, and Quality 90
- 4.1. Summary of Policy Recommendations for the Shorter and
Longer Terms..... 96
- 4.2. Eligibility Criteria for Publicly Funded ECE Programs
Serving Preschool-Age Children in California..... 97
- 5.1. Summary of Policy Recommendations, by Domain 126
- A.1. Eligibility Rates for Preschool-Age Children in
California for ECE Subsidies Under Alternative
Place-Based Targeting Rules Using Percentage of
Elementary-School Students in Child’s ZIP Code Who
Are Eligible for FRPMs, by Income Eligibility Status..... 138
- A.2. Eligibility Rates for Preschool-Age Children in
California for ECE Subsidies Under Place-Based
Eligibility Rule A Using School-Level FRPM Status, by
Income Eligibility Status and Selected Child and Family
Characteristics..... 139
- A.3. Eligibility Rate for Preschool-Age Children in
California for ECE Subsidies Under Alternative
Place-Based Targeting Rules Using Percentage of
Kindergarten Students in Child’s ZIP Code in Schools
with API Scores of 1 to 3, by Income Eligibility Status..... 142
- A.4. Eligibility Rates for Preschool-Age Children in
California for ECE Subsidies Under Place-Based
Eligibility Rule E Using School-Level API Status, by
Income Eligibility Status and Selected Child and Family
Characteristics..... 143

Summary

As California continues to debate reform of the K–12 education system, there has been a growing recognition that preschool policy should be an integral part of the policy discussions. Central to the debates about preschool policy are issues of both adequacy and efficiency. By *adequacy*, we mean that we are interested in whether current access to and quality of preschool education in California are sufficient to ensure that all children enter school ready to learn and meet California’s education standards. By *efficiency*, we mean that we want to know whether existing resources are being used to achieve the maximum possible benefit and how potential new resources could be used most effectively. Within this context, this study, which is the culmination of a broader research effort called the California Preschool Study, seeks to address four questions:

- What are the overall and cross-group achievement gaps for California’s children in terms of the state’s kindergarten through third grade (K–3) education standards, and what is the potential for high-quality preschool programs to raise achievement?
- How adequate is the quality of preschool education being received by California children, and what proportion of families have access to high-quality preschool that would be expected to produce the cognitive, social, and emotional benefits necessary to help children achieve the state’s early-elementary standards?
- What efficiencies can be obtained in the current system of funding for early care and education (ECE) programs serving children

one or two years before kindergarten entry in order to improve K–3 education outcomes?

- What additional ECE policies or resources would be required to ensure that all children in California are prepared to meet K–3 standards?

To address these questions, we draw on three interrelated studies we have already completed that were designed to improve our understanding of (1) gaps in school readiness and achievement in the early grades among California children and the potential for high-quality preschool programs to close existing gaps, (2) the use of ECE services among California’s children and the quality of those experiences, and (3) the system of publicly funded ECE programs in California in the two years before kindergarten entry.

In this summary of the fourth and final study component, we integrate the results from the three previous studies, as well as relevant prior research, to address the four broader issues related to preschool adequacy and efficiency just listed. We first highlight evidence of shortfalls in both preschool adequacy and efficiency. We then review design options for a preschool system and consider the merits of alternative approaches. Finally, we make specific policy recommendations and discuss the broader implications of addressing preschool adequacy and efficiency.

California Faces Shortfalls in Preschool Adequacy and Efficiency

The cumulative body of evidence from our investigation of preschool adequacy and efficiency has identified a number of shortcomings on both fronts.

In terms of adequacy, key issues include the following:

- At kindergarten entry, California children begin school with varying levels of readiness—measured by cognitive and noncognitive skills that have been shown to be predictive of later school suc-

cess. Socioeconomically disadvantaged children enter school with lower levels of readiness than their more advantaged peers. By second and third grades, these readiness gaps are manifested in sizable achievement differences in statewide standardized tests for English-language arts and mathematics by race-ethnicity, English-language fluency, parental education, and economic status.

- The current privately and publicly supported ECE system in California is marked by sharp contrasts in participation rates between more and less disadvantaged children and uneven delivery of quality services. Children with the largest gaps in school readiness and achievement are the least likely to participate in any preschool and the least likely to attend high-quality programs. Shortfalls in quality, as measured against the benchmarks attained in effective programs, are most evident for those measures strongly linked with promoting school readiness, such as providing developmentally appropriate learning supports. Other aspects of quality with room for improvement are teacher education and training, use of research-based curricula, and health and safety.
- Although a body of rigorous research shows that disadvantaged children can experience sizable benefits in both the shorter and longer terms from a high-quality preschool experience, California's system of publicly funded ECE programs targeted to lower-income children is underfunded. At current funding levels, the system is able to serve only about half of eligible three- and four-year-olds.

In terms of efficiency, the critical issues are as follows:

- Despite substantial public funding to support the California Title 5 child development–oriented preschool programs in California, the minimal regulation of some publicly subsidized providers that must only meet state licensing requirements (also known as *Alternative Payment [AP] providers*) and the weak standards on key program elements for the more highly regulated Title 5 programs does little to promote high-quality services in publicly funded programs. Moreover, providers have no financial incen-

tive, given the current reimbursement structure, to achieve higher quality. Thus, there is little assurance that the dollars spent on publicly subsidized preschool programs are supporting the maximum child development benefits.

- Current mechanisms for allocating funding to providers, whether through contracts, grants, or vouchers, make it difficult to spend all funding allocated for a given program year, thereby further diminishing the share of eligible children served.
- The complexity of the current system of publicly subsidized ECE programs makes it costly for providers to administer, challenging for families to navigate, and difficult for policymakers and the public to understand, evaluate, and improve.

An analysis of the data assembled on achievement gaps, rates of preschool participation, and the effectiveness of well-designed preschool programs shows that preschool can be part of the solution for raising achievement overall and narrowing achievement gaps between groups of students. However, different policy approaches have different implications for achievement gaps.

- If the goal is to raise student achievement in absolute terms for Latinos and African Americans, without reference to test scores of white students, then the largest *absolute* gain in test scores for Latinos and African Americans is associated with raising preschool participation and preschool quality for all groups of children—a universal approach. The estimated gain ranges from one-fifth to one-third of the size of the existing score gaps, depending on assumptions.
- The universal approach would also increase test scores for white children. So, if the goal is to narrow the score gap between Latinos and whites or African Americans and whites, the largest *relative* gain in student achievement is associated with targeted increases in preschool participation and quality for socioeconomically disadvantaged children, a larger proportion of whom are Latino or African American. With this targeted policy approach, the estimates suggest that the racial-ethnic achievement-score

gap could be narrowed by about 10 to 20 percent, depending on assumptions.

However, our analysis indicates that there would be almost no narrowing of absolute or relative achievement gaps from just raising preschool participation for all groups without any change in preschool quality. These results suggest that raising preschool quality is essential if preschool is to be an effective policy lever for addressing achievement gaps.

Thus, addressing shortfalls in preschool adequacy in California means raising participation rates for more disadvantaged children while also raising quality, particularly for those program features that are linked to advances in school readiness. Remedying shortcomings in preschool efficiency will require efforts to use existing resources more effectively to support expanded access or quality improvements, as well as putting any new resources toward the most-effective strategies for promoting school readiness and subsequent education success.

At the same time, our analysis of preschool benefits and achievement gaps under alternative policy scenarios shows that greater preschool access or quality enhancements alone are not sufficient to completely narrow existing achievement gaps, such as those evident between different racial-ethnic groups. Thus, we note in the last section of this summary the need to make preschool policy part of a coordinated set of strategies to foster success in K–12 education and beyond.

Options for Designing a Preschool System for California

If California could design a publicly funded preschool system from first principles, it would likely be different from the system that has evolved over time. Key design options for a publicly subsidized preschool system include (1) access (which children are eligible?), (2) delivery (which providers deliver services?), (3) quality (what ensures that services are of high quality?), and (4) infrastructure (what supports ensure an efficient system?). Theoretical considerations, as well as experiences

and research-based evidence from other states, can provide guidance regarding the merits of alternative approaches.

Access

In terms of access, four key design choices include universal versus targeted availability, the targeting approach for programs that are not universal, whether services are available for one year or two, and mechanisms for prioritizing eligibility when even targeted programs are underfunded.

- *Universal Versus Targeted:* Policymakers must weight the trade-offs between universal and targeted publicly funded preschool programs. Issues of total program cost and displacement of private spending—both clearly higher with a universal program—tend to be arguments made in favor of a targeting approach. Issues of lower administrative costs, greater targeting efficiency, and higher participation rates with less stigma are often made to support a universal approach. A universal approach may also produce greater political and public support for a program funded at the level required to deliver high-quality services. The issue of economic returns would likely favor a targeting approach if the goal is achieving high returns per child served, whereas a goal of maximizing total economic benefits may be achieved by moving toward a universal program.
- *The Targeting Approach: Person Based or Place Based:* For targeted programs, another consideration is whether targeting is person based (e.g., based on family income) or place based (e.g., based on the percentage of children in the community in poverty), where the choice may depend on the size and geographic concentration of the target population and the differential administrative costs of the two approaches. The two approaches may also be combined, although this typically means serving some children who would not be eligible under person-based eligibility criteria but are eligible because they live in communities targeted by the place-based criteria.

- *One Year or Two:* When resources are not sufficient to serve both three- and four-year-olds in a universal program, other research evidence suggests that it would be more efficient to serve the most disadvantaged four-year-olds first. As more resources become available, eligibility could be extended further for four-year-old children, while program services are also made available to the most disadvantaged three-year-olds. Eventually, as more resources become available, the system may serve all four-year-olds and a targeted group of three-year-olds or, with further expansion, all three-year-olds as well.
- *Prioritizing Eligibility in Underfunded Programs:* When there are insufficient funds to serve all eligible children, greater benefits from the dollars spent may be obtained when eligibility is further prioritized. This consideration suggests (1) serving children who would benefit the most first before serving those who would benefit less, (2) promoting placement in the same subsidized preschool program for a given preschool year and across years for those participating at ages three and four, and (3) implementing a rationing process that is easy for parents to understand and providers and other intermediaries to administer.

Delivery

In the delivery domain, most state systems fall into one of two standard approaches: (1) delivery through public schools, in some cases with the option that schools will subcontract out provision to other providers in the community, and (2) delivery through a combination of public providers (i.e., schools) and other community-based organizations (CBOs) (e.g., nonprofits; churches, synagogues, or other religious institutions; private schools). Research evidence to date suggests that delivery of high-quality preschool services can be attained with either approach, and there is no evidence to suggest that public or private providers are necessarily more effective. There may be differences in culture, capacity, cost, and other factors that would favor using one delivery mode over the other. For example, states that have opted to fund preschool

programs through the existing school-funding formula have concentrated delivery through public school providers.

Quality

There are also multiple approaches for ensuring high quality in publicly funded preschool programs. Ultimately, the goal is to combine both structural program elements (e.g., the resources in a classroom) and process program elements (e.g., how teachers and children interact in the classroom) to produce the maximum child development benefits for a given budget. In the absence of a formula to determine the optimal combination, various strategies, usually in combination, are in use by states to promote quality. These include licensing requirements or other program standards, independent accreditation, use of a quality rating system (QRS) or quality rating and improvement system (QRIS), making results of licensing outcomes or quality ratings public and accessible, providing financial incentives to achieve higher quality, and evaluating programs in terms of child development outcomes.

These approaches are designed to bridge the information asymmetries that characterize the child-care and preschool markets (i.e., that parents as consumers do not have full information about program quality when making their participation decisions), although each has strengths and weaknesses. Research indicates that these approaches are successful only to the extent that the quality information is current and the quality inputs that are measured are those that matter for promoting child development.

Infrastructure

A number of other design elements fall under the category of infrastructure. These include governance, financing and fiscal planning, information systems, learning standards and assessments, preschool and K–12 linkages, facilities, workforce development, and communications with parents and the public. These are key features that undergird a preschool system in terms of supporting other elements of the system, such as access, delivery, and quality, as well as system efficiency and effectiveness. For these system features, there is a relative paucity of research to suggest which approaches in any of these areas will be most

effective. Rather, the approaches adopted in other states may provide relevant models and evidence of the effectiveness of these alternative models that other states may use to guide their own policy choices.

Recommendations for Advancing Preschool Adequacy and Efficiency

Considering various design options for a preschool program in terms of access, delivery, quality, and infrastructure, as well as research evidence regarding the effectiveness of alternative approaches, we provide a series of recommendations in support of the following policy goals for California:

- Increase access, especially for underserved groups.
- Raise quality, either for underserved groups or across the board, especially for those quality dimensions with the biggest shortfalls.
- Advance toward a more efficient and coordinated system.
- Provide appropriate infrastructure supports.

Some recommendations were viewed as appropriate in the short run under the expectation that significant new resources would not be available. For a medium-term horizon in which more resources are devoted to preschool provision in California, we offer a series of recommendations on how best to use those new resources. Table S.1 summarizes the list of recommendations, grouped (and numbered) within the access, delivery, quality, and infrastructure domains, where those that require substantial new resources are noted. (More detailed suggestions regarding implementation of these recommendations are provided in Chapter Four.)

Improving the Efficiency of Existing Resources

The nine shorter-term recommendations in Table S.1 are designed to use existing resources or modest resource increases (or reallocations if efficiencies are achieved) to create a more efficient and coordinated

Table S.1
Summary of Policy Recommendations by Domain

Domain	Recommendation	Description
Access	A1	Align the eligibility-determination process and allocation of children to slots with the policy objective of first serving children who can benefit most.
	A2 ^a	As access to preschool is extended, prioritize serving a larger share of currently eligible four-year-olds and three-year-olds in poverty.
	A3 ^a	As access to preschool is extended to a larger share of the population, consider combining geographic targeting with income targeting.
Delivery	D1	Modify the contract mechanism for Title 5 and AP programs to reduce the extent of unused funds and other inefficiencies.
	D2	Implement a common reimbursement structure within a system with mixed delivery and diverse funding streams.
Quality	Q1	Increase the routine licensing inspection rate for child-care centers and family child-care homes, and make inspection reports publicly available on the Internet.
	Q2	Develop and pilot a QRIS and tiered reimbursement system as part of the state's larger effort to create an Early Learning Quality Improvement System.
	Q3 ^a	Use a multipronged strategy—with an emphasis on measurement and monitoring, financial incentives and supports, and accountability—to promote higher-quality preschool experiences in subsidized programs.
Infrastructure	I1	Evaluate options for alternative governance structures in terms of the agencies that regulate and administer ECE programs, and change the structure if greater efficiency and effectiveness can be obtained.
	I2	Make greater use of the option to allocate Title I funds for preschool programs.
	I3	Fund the implementation of the preschool through higher education (P-16) longitudinal data system envisioned under recent legislation (California Senate Bill [SB] 1298).

Table S.1—Continued

Domain	Recommendation	Description
Infrastructure, continued	I4	Examine the adequacy and efficiency of the workforce development system for the ECE workforce, and make recommendations to align with future preschool policies.
	I5a	Address workforce, facility, and other infrastructure supports needed to provide high-quality preschool for children currently eligible and those who will be eligible under any future expansion of eligibility.

SOURCE: Author’s analysis.

^a Recommendation requires substantial new resources.

preschool system with appropriate infrastructure supports. This would be accomplished by doing the following:

- Modify the process of eligibility determination to ensure that children who can benefit most are served first and that there is stability in enrollment within a program year and across program years for those who start at age three (recommendation A1).
- Reduce inefficiencies in contracting mechanisms by introducing greater flexibility in how funds are allocated and reallocated and possibly shifting from contracts that reimburse child-days served to grants with minimum enrollment or attendance requirements (recommendation D1).
- Standardize reimbursement structures (e.g., rate differentials by ages of children served or hours of program services) across subsidized ECE programs for preschool-age children, retaining elements in some parts of the system, such as reimbursement rates that vary by geography to account for differences in the cost of service provision (recommendation D2).
- Build a foundation for future quality improvements through an increase in routine licensing inspections that produce readily accessible, published reports and through the development and testing of a QRIS and tiered reimbursement system (recommendations Q1 and Q2, respectively).

- Promote more-effective infrastructure support by assessing options for alternative governance structures (e.g., which agencies regulate and administer ECE programs), increasing the use of Title I funds for preschool, funding the development and use of P–16 longitudinal data systems, and assessing ways to advance the structure of the workforce development system (recommendations I1, I2, I3, and I4, respectively).

Investing New Resources to Expand Access or Raise Quality

The remaining longer-term recommendations are designed to make effective use of any significant new resources that are devoted to expanding preschool access and raising quality. Given the trade-offs inherent in a universal approach versus a targeting one, we have not made a recommendation for one approach or the other. We have, however, argued that, with only about 50 percent of currently eligible lower-income children being served by publicly subsidized programs, California could continue to expand enrollments under current eligibility rules or even expand eligibility criteria and still serve children who would be expected to generate a net positive benefit (i.e., benefits to government or society that exceed program costs). Thus, we recommend that new funds be used to do the following:

- Expand coverage to those who will benefit the most, which means that an initial priority would be to serve a larger share of currently eligible four-year-olds and three-year-olds with income below the federal poverty line (recommendation A2).
- Implement place-based targeting combined with person-based targeting as the size of the eligible population expands (recommendation A3).
- Promote quality improvements, especially for program features most important for child development, by implementing a multi-pronged approach that includes quality measurement and monitoring, financial incentives and supports, and accountability through evaluating child development outcomes (recommendation Q3).

- Address the infrastructure supports needed to achieve higher quality and expanded access, especially in such areas as workforce development and facilities (recommendation I5).

As noted earlier, with most of the policy changes listed in Table S.1, a period of piloting and evaluation is appropriate. Given the variation across California counties that already exists in ECE implementation, such as with the Power of Preschool (PoP) demonstration projects and associated Preschool for All initiatives under way in several counties, California has natural laboratories for testing and evaluating new approaches. If efforts are expanded to a larger scale, continued studies can assess whether the desired outcomes are attained or whether further refinements are needed.

The nine recommendations in Table S.1 that do not require a significant infusion of new resources for implementation offer a strategic approach for California to institute incremental reforms to the current system of publicly funded ECE programs to deliver more services with the same resources or to lay a foundation for expanding access and raising quality in the future as new resources become available. Although California is unlikely to devote significant new resources for subsidized preschool programs in the near term, new resources will be coming to the state through the American Recovery and Reinvestment Act (ARRA) of 2009 (Pub. L. No. 111-5). Some of those resources will be designated for specific purposes, such as increasing enrollments or enhancing data systems. The recommendation to devote more Title I funds to preschool education may also be possible with the new federal funding. Flexible funds under the ARRA could be used to provide a down payment on some of the initiatives recommended in Table S.1 that require new resources, such as implementing a QRIS or investing in the education and training of the ECE workforce. Given the stated priorities of the Obama administration in the proposed 2010 fiscal year (FY) budget, California may also benefit from additional federal investments in early-education services beyond those included in the ARRA.

Broader Implications

Although our focus for purposes of this study has been on preschool programs serving children one or two years before kindergarten entry, it is important to consider the broader implications of reforms to California's preschool system in order to promote adequacy and efficiency.

First, the publicly subsidized preschool system is effectively embedded within a larger child-care and early-education system that serves children from birth to age 12. For the most part, within a given funding stream (such as the Title 5 child development program or the California Work Opportunities and Responsibility to Kids [CalWORKs] stages), the same eligibility rules, licensing and program standards (with some variation for the ages of children served), contracting mechanism, and reimbursement structure apply to programs whether they serve infants and toddlers, preschool-age children, or school-age children. In many cases, the same providers serve children in the entire age range. In addition, the entire 0–12 system falls under a common governance structure.

Thus, to maintain uniformity within the 0–12 system, changes to the preschool part of the system may imply the need for comparable changes to the parts of the program that serve younger and older children. In many cases, the types of recommended reforms, such as a more flexible contracting mechanism, a common reimbursement system, or a QRIS, could be beneficial for, and replicated for, the entire system, albeit with some differences to reflect the ages of the children served. In other cases, such as expanding access, the reforms may be possible only for the preschool component of the system, depending on available funds.

Second, many of the recommendations regarding reforms to the preschool system are similar to those that have been recommended for K–12 education by such groups as the Governor's Committee on Education Excellence established by Governor Arnold Schwarzenegger and the California P–16 Council established by State Superintendent of Public Instruction Jack O'Connell. Although the preschool and K–12 systems are very different and specific solutions may vary with respect to each component, some general strategies in terms of gover-

nance, financing, English-language learners (ELLs), workforce development, facilities, and so on may benefit from addressing these issues in a coordinated fashion and considering the transferability of effective practices from the K–12 arena to the preschool domain and vice versa. At the very least, reforms being considered for the K–12 system must account for the possible impact on the preschool system and the reverse as well. Ultimately, on all fronts, California needs to create a P–12 or P–16 system that is truly integrated and coordinated.

Third, our analysis confirms that advancing preschool access and quality cannot be expected to close existing achievement gaps. In the effort to raise achievement for all students, but especially for more-disadvantaged students, consideration also needs to be given to programs serving children and families from birth to age three, as well as services for school-age children, to support continued learning. Other successful center-based program models with a rigorous evidence base include the Carolina Abecedarian Project, Infant Health and Development Program, and Syracuse Family Development Research Program, each of which provided full-time, year-round, center-based services starting soon after birth and continuing as long as until kindergarten entry. The Chicago Child-Parent Center (CPC) and Abecedarian programs provide examples of programs that continue supportive services into the early elementary grades and have strengthened the ability to sustain the advantages conferred through preschool participation. Non-center-based early-intervention models like the Nurse-Family Partnership home-visiting program have also demonstrated short- and longer-term benefits. Given the existence of other proven models for promoting healthy child development before and after kindergarten entry, it is vital that preschool programs be considered as part of a continuum of services designed to prepare children for kindergarten and to ensure their success in school and beyond.

Acknowledgments

I would like to express my appreciation for the guidance that Kathleen Reich, the project's program officer from the Packard Foundation, and other staff at the foundation provided throughout the course of this project. Each phase of the project, including this final study, has also benefited from the feedback from members of the project advisory group: Sue Allen, vice chair, Early Childhood Education Committee of the California Teachers' Association, and kindergarten teacher, Middletown Unified School District; Catherine Atkin, president, Preschool California; K. Alison Clarke-Stewart, professor of psychology, University of California—Irvine; Allison Sidle Fuligni, assistant professor, Department of Child and Family Studies, California State University, Los Angeles; Theresa Garcia-Araya, education policy consultant; William Gormley, professor of public policy, Georgetown University; Karen Hill Scott, president, Karen Hill Scott Company; Moira Kenney, statewide program director, First Five Association of California; Carlise King, California Child Care Research and Referral Network; Fran Kipnis, Center for the Study of Child Care Employment, University of California, Berkeley; Susanna Loeb, professor of education, Stanford University; Gary Mangiofico, CEO, Los Angeles Universal Preschool; Robert Manwaring, senior policy analyst, Education Sector; Patricia Phipps, early-childhood consultant; Nancy Remley, Child Development Division, California Department of Education; and Charles Weis, county superintendent of schools, Santa Clara County Office of Education. Susan Muenchow of the American Institutes for Research also provided constructive feedback on an earlier draft.

This monograph draws on the three prior studies that were completed in collaboration with colleagues at RAND and elsewhere—namely, Jill Cannon, Michelle Cho, Lynda Fernyhough, Bonnie Ghosh-Dastidar, Michal Perlman, Elaine Reardon, and Gail Zellman. I am grateful for their earlier contributions to the overall study effort, which, together, comprise the backbone of this analysis. Adria Jewell at RAND provided expert programming support for the additional analyses in this volume.

The RAND Labor and Population review process employs anonymous peer reviewers, including at least one reviewer who is external to the RAND Corporation. This study benefited from the thorough technical reviews of two anonymous reviewers, which served to improve the rigor, accuracy, and clarity of our analysis.

Abbreviations

AB	assembly bill
ACF	Administration for Children and Families
AP	Alternative Payment
API	academic-performance index
ARRA	American Recovery and Reinvestment Act of 2009
CALPADS	California Longitudinal Pupil Achievement Data System
Cal-SAFE	California School Age Families Education
CALTIDES	California Longitudinal Teacher Integrated Data Education System
CalWORKs	California Work Opportunity and Responsibility to Kids
CBEDS	California Basic Educational Data System
CBO	community-based organization
CCD	Child Care and Development
CCDBG	Child Care and Development Block Grant
CDE	California Department of Education
CDSS	California Department of Social Services

CEL	Centralized Eligibility List
CELDT	California English Language Development Test
CLASS	Classroom Assessment Scoring System
COE	county office of education
CPC	Child-Parent Center
CST	California Standards Test
DRDP-R2	Desired Results Developmental Profile, revision 2
ECE	early care and education
ECERS-R	Early Childhood Environment Rating Scale, revised edition
ECLS-K	Early Childhood Longitudinal Study, Kindergarten Class of 1998–99
EDW	K–20 Education Data Warehouse
ELL	English-language learner
FRPM	free or reduced-price meal
FY	fiscal year
HHS	U.S. Department of Health and Human Services
ISL	Instructional Support for Learning
LAUP	Los Angeles Universal Preschool
NACCRRA	National Association of Child Care Resource and Referral Agencies
NAEYC	National Association for the Education of Young Children
NCLB	No Child Left Behind Act of 2001
NIEER	National Institute for Early Education Research

NSLP	National School Lunch Program
PKFL	Prekindergarten and Family Literacy
PoP	Power of Preschool
PPVT	Peabody Picture Vocabulary Test
QRIS	quality rating and improvement system
QRS	quality rating system
RMR	regional market rate
SB	senate bill
SFY	state fiscal year
SMI	state median income
SRR	standard reimbursement rate
STARS	Standards, Training/Professional Development, Assistance, Resources, and Support
TANF	Temporary Assistance for Needy Families

Introduction

One of the primary motivations for education reform in California, as in other states, is the need to raise the overall levels of student achievement and, even more importantly, to narrow the often substantial achievement gaps between low- and high-performing students. A central question in the education-reform debate is the adequacy of the state's education system to ensure that all California students can succeed and become productive citizens. State and local budget constraints have also prompted efforts to reexamine resource allocations to see that dollars are being invested to ensure a high return. Thus, the efficiency of the state's public education sector has gained currency as well. The dual interest in K–12 adequacy and efficiency in California led to a major effort to examine these issues from multiple perspectives as part of the *Getting Down to Facts* initiative (Loeb, Bryk, and Hanushek, 2007).

As California continues to debate reform of the K–12 education system, there has been a growing recognition that preschool policy should be an integral part of the policy discussions. Within this context, this study seeks to address four overarching questions:

- What are the overall and cross-group achievement gaps for California's children in terms of the state's kindergarten through third grade (K–3) education standards, and what is the potential for high-quality preschool programs to raise achievement?
- How adequate is the quality of preschool education being received by California children, and what proportion of families have access to high-quality preschool that would be expected to produce the

cognitive, social, and emotional benefits necessary to help children achieve the state's early-elementary standards?

- What efficiencies can be obtained in the current system of funding for early care and education (ECE) programs serving children one or two years before kindergarten entry in order to improve K–3 education outcomes?
- What additional ECE policies or resources would be required to ensure that all children in California are prepared to meet K–3 standards?

For the purposes of this study, by *adequacy*, we mean that we are interested in whether current access to and quality of preschool education in California are sufficient to ensure that all children enter school ready to learn and meet California's education standards. By *efficiency*, we mean that we want to know whether existing resources are being used to achieve the maximum possible benefit and how potential new resources could be used most effectively.

To address these questions, we draw on the results of three inter-related studies conducted as part of this project that were designed to advance our knowledge regarding (1) achievement gaps among California children in the early grades (Cannon and Karoly, 2007b); (2) the utilization of ECE services among California's children and the quality of those experiences (Karoly, Ghosh-Dastidar, et al., 2008a); and (3) the system of public funding in California for ECE programs in the two years prior to kindergarten entry (Karoly, Reardon, and Cho, 2007a).

Throughout this analysis, our focus is on preschool programs that serve children one or two years before kindergarten entry, children we label as *four-year-olds* and *three-year-olds*, respectively. We use the term *preschool* to also mean prekindergarten programs. References to ECE programs include other forms of child care in addition to early-learning programs. Although we do not separately examine issues for children with special needs, most of the public programs we consider are inclusive of children with disabilities. In addition, although the focus is on programs for preschool-age children, many of the policy options and recommendations discussed in this study have

implications for the broader system of subsidized child-care programs that serve children from birth to age three, as well as programs that serve children after school entry (typically until age 12). We discuss these linkages between subsidized ECE programs for preschoolers and programs for infants, toddlers, and school-age children in the final chapter.

In considering preschool policy options, we recognize that there are significant concerns associated with the current state of the economy and the concomitant fiscal crisis that all levels of government face. For that reason, our interest centers on what can be accomplished with existing funds and how best to direct new resources when the fiscal situation improves and new funds may be allocated to preschool programs.

Before turning to the research questions in the chapters that follow, we quickly review the landscape of recent preschool policy developments in the United States and California.

Preschool Policy Developments in the United States

Preschool policy in the United States is set at multiple levels—federal, state, and local—consistent with the multiple funding streams that support early-learning programs and child care for preschool-age children. ECE programs serving children one or two years before kindergarten entry are funded with a mixture of federal, state, and local public funds, as well as private funds that come directly from families or other private entities (e.g., employers, foundations, religious groups, other charitable organizations). At the federal level, Head Start, Title I, Temporary Assistance for Needy Families (TANF), and the Child Care and Development Block Grant (CCDBG) program provide funds for ECE programs targeted to low-income families, including subsidized child care. Federal tax policy also subsidizes child care for qualifying families. In addition, through the 2001 No Child Left Behind (NCLB) legislation (Pub. L. No. 107-110), the federal government emphasized spending on early education as part of a systematic effort to raise student achievement. The reauthorization of TANF in

2006 and Head Start in 2007 included provisions that would potentially expand access and lead to quality enhancements.¹ These objectives have also been incorporated in the new funding for Head Start, CCDBG, and other early-childhood programs in the 2009 American Recovery and Reinvestment Act (ARRA) (Pub. L. No. 111-5) and in President Barack Obama's proposed fiscal year (FY) 2010 federal budget.

Although these recent developments signal a potentially more active role in early-childhood policy at the federal level, initiatives at the state level arguably represent the most active arena of preschool policy development in the past several years. Given that federal funding for ECE programs serving preschool-age children is targeted and available funds are not sufficient to reach all eligible children, a growing number of states have instituted policies to expand access to and raise the quality of preschool programs serving four-year-olds and, in some cases, three-year-olds. In support of these objectives, other initiatives include designing or modifying models for program delivery and financing, as well as systems for governance and data. One marker of the expanding state involvement in preschool policy is the growth in state-funded preschool programs, an increase from \$2.4 billion in 2001–2002 to \$3.7 billion in 2006–2007 (Barnett, Robin, et al., 2003; Barnett, Hustedt, Friedman, et al., 2007). As of 2006–2007, the state-funded programs in 38 states served more than 1 million children. State programs now serve more children than the federal Head Start program, which reached nearly 720,000 children in the same year, although Head Start funding to grantees of \$5.9 billion still exceeds the states' financial commitment.²

¹ For example, TANF reauthorization provided for additional child-care funds and greater flexibility in moving funds from the TANF block grant into the CCDBG fund. Head Start reauthorization extended the income eligibility threshold so that programs can potentially serve children in families with income up to 130 percent of poverty, provided that they can demonstrate that children below poverty are being served. The reauthorization also continues to increase the education requirements for Head Start teachers, requiring 100 percent to have an associate's degree by 2011 and 50 percent to have a bachelor's degree by 2013.

² The Head Start figures exclude enrollment and funding for American Indian/Alaska Native and migrant populations. See Administration for Children and Families (ACF)

Table 1.1 summarizes the domains of preschool policy at the state level and provides examples of the approaches taken across the states within each domain. In terms of access, key policy choices include whether programs are targeted or universal and whether programs serve four-year-olds only or whether they also include three-year-olds (Barnett, Hustedt, Friedman, et al., 2007). At present, of the 38 states with preschool programs, Florida, Georgia, and Oklahoma are the only states with voluntary universal and free preschool programs, in each case open only to four-year-olds. Other states, including Illinois, Louisiana, Massachusetts, New York, and West Virginia, have charted a course toward universal coverage, although funding for planned enrollment increases has not always materialized as hoped. In terms of the ages covered, as of 2006–2007, 26 states had programs that served children both one and two years before kindergarten entry, although priority is typically given to the older age group. In 2006, Illinois became the first state committed to serving all three- and four-year-olds through its Preschool for All initiative.

Table 1.2 further indicates that there is no single model that can be used to characterize the delivery features of state preschool programs. In terms of program provision, a handful of states provide only supplemental funds for Head Start, replicating the Head Start model (including Performance Standards), with funding to augment existing Head Start programs or to establish new programs.³ A few other states provide supplemental Head Start funding in addition to their own preschool initiatives.⁴ Among states with their own state-funded programs, there are two basic models, and the states are almost evenly divided between them (Schumacher et al., 2005). One model effectively provides funding to public school districts or schools through grants (sometimes competitive) or the state's school funding formula. Typically, the public schools may deliver the programs themselves or

(2008) for complete totals. The state funding figures exclude local funds that supplement the state amounts, so the gap with Head Start is actually smaller.

³ These states include Delaware, Oregon, and Minnesota.

⁴ These states include Maryland, Massachusetts, New Mexico, Oklahoma, Pennsylvania, and Wisconsin.

Table 1.1
Preschool Policy Domains and Approaches at the State Level

Domains		Examples of Approaches
Access		Universal preschool program Targeted program expanding toward universal preschool program Targeted preschool program Serve only four-year-olds Serve three- and four-year-olds
Delivery	Provision	Add funding to Head Start Separate state-defined program Provision through public schools (with option for contracting out) Provision through mixed public and private providers
	Intensity	Half day versus full day Academic year versus year-round
	Structure	Requirements for maximum class size and child-staff ratio Requirements for teacher education and training Early-learning standards Required curriculum
	Other services	Wraparound care Specialized services for English-language learners (ELLs) Parenting programs
Quality		Quality rating and improvement systems (QRISs) Tiered reimbursement systems
Other	Financing	General revenues Dedicated funding streams (e.g., lottery, earmarked taxes) Title I
	Governance	Consolidate in new agency Consolidate in existing agency Establish high-level, multiagency coordinating body
	Data	Integrate preschool into longitudinal student-level data systems

SOURCE: Author’s analysis based on Barnett, Hustedt, Friedman, et al. (2007), and Center for Law and Social Policy (2007).

may choose (or are sometimes required) to subcontract out at least a portion of the funds to other providers (e.g., Head Start programs, child-care centers, or other community-based organizations [CBOs]). The second model also relies on a mixed delivery system, but funds are typically allocated, usually on a competitive basis, to both public

Table 1.2
Number of States with Preschool Program Delivery Features, as of
2006–2007

Program Feature	Number of States
Program provision	
Additional funding for Head Start	9
Separate state program: public schools (with subcontracting)	19
Preschool program is included in school funding formula	15
Separate state program: mixed delivery	18
Key structural features	
Class size no larger than 20	33
Child-staff ratio of 10:1 or lower	34
Lead teacher has a bachelor's degree	22
Early-learning standards	32
Designated, approved curricula	14
Program intensity	
Part day	10
Full day	12
Academic year	36

SOURCE: Author's analysis based on Barnett, Hustedt, Friedman, et al. (2007), and Pre-K Now (undated).

NOTE: For states with multiple programs, if any program had a feature, it was counted as applying to that state.

and private providers of various types. Again, some states employ both models in the same or distinct programs.

Other dimensions along which state preschool program–delivery features vary include structural requirements and program intensity. There is near uniformity across the states in requiring class sizes and child-staff ratios that meet the National Association for the Education of Young Children (NAEYC) accreditation criteria (NAEYC, 2005, undated[a]). However, in terms of teacher education requirements,

where there is less agreement in the profession over the level required to ensure high-quality programs, just 22 state programs require the lead teacher to have a bachelor's degree, even though this would be required for kindergarten teachers in all the states. Although most state programs operate on an academic-year schedule, there is variation in whether programs are part-day or full-day programs (the residual group allows local choice). Likewise, most state programs incorporate comprehensive early-learning standards, but a smaller number designate one or more approved curricula.

Another major focus for state policy has been advancing the quality of preschool programs. In addition to specifying minimum program standards, such as the structural features listed in Table 1.2, states are developing and implementing quality improvement systems, including quality rating scales (Barnett, Hustedt, Friedman, et al., 2007). In several cases, the quality rating systems (QRSs) were originally established to rate child-care centers serving children in a broader age range (e.g., birth and beyond). For example, North Carolina uses a star rating system (ranging from one to five stars) as part of its licensing of child-care providers. Programs are eligible to participate in the More at Four Pre-Kindergarten Program if they achieve a four- or five-star rating. Pennsylvania has tied provider eligibility for its Head Start Supplemental Assistance Program to participation in its Keystone STARS (Standards, Training/Professional Development, Assistance, Resources, and Support) QRS at the two-star level (out of four stars) or higher. Other states, including Connecticut, Delaware, Massachusetts, and Vermont, are developing or piloting QRSs or QRISs for their preschool programs (Barnett, Hustedt, Friedman, et al., 2007).

To provide financial incentives to achieve higher quality standards or ratings, some states have implemented or are moving toward tiered reimbursement systems that provide higher levels of reimbursement when higher quality is achieved. For example, Louisiana ties reimbursement to the credentials of lead teachers and classroom assistants, whereas Missouri provides higher funding for accredited programs (Barnett, Hustedt, Friedman, et al., 2007). As of 2006–2007,

there were no states that tied reimbursement for their preschool programs to a QRS.⁵

Since expanding access and raising quality generally require more resources, states have also looked to various funding streams to support their initiatives. With only a few exceptions, all states that supplement Head Start or have their own preschool programs rely, at least in part, on general revenues (Stone, 2006). General revenues, although flexible, require legislative approval and are subject to cuts when budgets are tight or policy priorities shift. Consequently, states have looked to other, more stable and dependable sources of funding. In some cases, states rely on lotteries (e.g., Georgia, North Carolina, and Tennessee) or gaming revenue (e.g., Missouri) for part or all of their preschool funding, whereas other states have dedicated sales or excise taxes (e.g., Arizona, Arkansas, and California) that are used to support preschool programs. Other earmarked funding sources include tobacco-settlement monies (e.g., in Kansas and Louisiana) (Stone, 2006). Federal Title I funding has long been a relatively flexible funding source to support preschool programs, although many states have not devoted significant Title I monies to preschool programs (Ewen and Matthews, 2007; Barnett and Frede, 2009).⁶ As of 2006–2007, just five states explicitly reported using Title I funds for their state preschool programs, but this is likely to be an undercount, as many states did not report detailed funding sources and Title I allocation decisions are made at the local level (Barnett, Hustedt, Friedman, et al., 2007).

As states have expanded their commitments to early-education programs, they have also reconsidered the governance structure that will be most effective. For example, it is not uncommon for some ECE programs to be administered by the state education agency (e.g., a state preschool program), whereas others fall under the state human or social services agency (e.g., child-care funds associated with TANF or CCDBG). Several alternative models have been implemented in

⁵ Such tiered reimbursement systems linked to quality rating scales are in place for child-care subsidies in a number of states.

⁶ For example, Barnett and Frede (2009) report that, out of a total of \$14 billion, an estimated \$400 million in Title I monies go toward preschool programs.

different states to reduce fragmentation and promote more effective governance (Center for Law and Social Policy, 2007). One approach is to consolidate most or all ECE programs as part of one existing agency. For example, in 2005, Maryland established the Division of Early Childhood Development at the Maryland State Department of Education. The new division incorporates programs previously in the Early Learning Branch in the same department, as well as the Office of Children, Youth, and Families within the Department of Human Resources. The state was one of the first to integrate child-care subsidy programs and child-care regulation within a department that also covers prekindergarten programs and other education services.

A second strategy is to consolidate ECE programs under a new department. For example, Massachusetts created the Department of Early Education and Care in 2005 with a primary focus on early education but a broader mandate that covers programs serving families with children from birth to age 14. The new department houses programs previously in the Office of Child Care Services and the Early Learning Services Division of the Department of Elementary and Secondary Education. Early-intervention services remain in the Department of Public Health. As another example, Washington State established the new, cabinet-level Department of Early Learning in 2006, combining programs previously housed in three agencies. Finally, in 2006, Pennsylvania adopted yet a third strategy, which was to create a high-level, cross-agency office—in Pennsylvania's case, the Office of Child Development and Early Learning—which has standing in both the Department of Public Welfare and the Department of Education and responsibility for coordinating ECE programs across the two departments.

Motivated in part by the data requirements in NCLB, states have also been forging comprehensive, longitudinal data systems that integrate preschool program inputs and outputs into their systems covering K–12 education and beyond. For example, Florida's K–20 Education Data Warehouse (EDW) serves as a repository for longitudinal information on students, education curricula, schools, and teachers from prekindergarten through graduate school (Florida Department of Education, undated). The EDW serves as a model of a cutting-edge data system (Hansen, 2006). Other states are building P–12 or P–16

systems, with plans to extend the data coverage further as resources allow.

Preschool Policy Developments in California

California has had a long-standing commitment to providing a foundation for education success through early-learning programs. The California State Preschool program dates back to 1965, the same year that the federal Head Start program was established, signaling an early recognition of the benefit of promoting the school readiness of disadvantaged children. The passage of the Proposition 10 voter initiative in 1998, also known as the California Children and Families First Act, provided a dedicated funding stream from a \$0.50-per-pack increase in the state surtax on cigarettes to support programs serving children from birth to age five. The commitment to early-childhood education was broadened with the 2002 California Master Plan for Education (California Legislature, 2002). The master plan, required by a 1998 concurrent resolution of the state legislature, aimed to define “what is required to provide a high-quality education” (California Legislature, 2002, p. 5). Although much of the emphasis was on the K–12 education system, the master plan also incorporated recommendations regarding early-education programs—specifically, a call for voluntary, universal preschool for all three- and four-year-olds, starting with children in poverty. The call for universal preschool was answered in Proposition 82, a statewide voter initiative on the June 2006 ballot that would have made a free, part-day preschool program available for all four-year-olds whose parents wanted to enroll them. The initiative garnered just under 40 percent of the vote.

In the wake of the failure to pass Proposition 82, interest in preschool policy remained high on the part of various stakeholders, and efforts focused on placing preschool policy in the context of K–12 education reform and narrowing achievement gaps. In late 2007 and early 2008, two sets of recommendations regarding education reform were promulgated: one by the Governor’s Committee on Education Excellence (2007a, 2007b) established by Governor Schwarzenegger,

the other by the California P–16 Council established by State Superintendent of Public Instruction Jack O’Connell. In addition to their focus on K–12 education reforms, these two bodies offered quite complementary recommendations for increasing access to and advancing the quality of publicly funded preschool programs, as illustrated in Table 1.3.⁷

Although the current fiscal crisis in California has limited options for expanding funding for ECE programs, other policy developments have proceeded, consistent with some of the recommendations in Table 1.3. Notably, in September 2008, Governor Schwarzenegger signed three bills focused on various aspects of ECE program provision, quality, and data. Assembly Bill (AB) 2759 streamlined funding in California Title 5 ECE programs, whereas Senate Bill (SB) 1629 created the Early Learning Quality Improvement System Advisory Committee. SB 1298 modified existing law to extend the creation of longitudinal student data for the K–12 system to include data from federal- and state-funded center-based child care and development programs.

More specifically, as of July 2009, AB 2759 will consolidate five Title 5 programs—the California State Preschool program (part and full day), Prekindergarten and Family Literacy (PKFL) program (part and full day), and General Child Care and Development (CCD) program (for preschool-age children)—into one unified program, the California State Preschool program, serving three- and four-year-old children. The consolidated program, with common statutory and regulatory requirements and a streamlined administration, is the largest state-funded preschool program in the country. Through consolidation, the expectation is a more efficient system to manage and deliver, as the state will have a single contract with each provider for one integrated program, rather than multiple contracts, and providers will have more-simplified reporting requirements and fiscal management. Figure 1.1

⁷ We have omitted from Table 1.3 preschool-related recommendations that affect the K–12 system, such as the recommendation by the Governor’s Committee on Education Excellence (2007a) to make full-day kindergarten universal.

Table 1.3
Recommendations Regarding Early-Education Policy from Two California
Advisory Bodies

Recommendation		Governor's Committee on Education Excellence	California P-16 Council
Overall		Implement a mixed-delivery, statewide preschool system for all low-income 3- to 4-year-olds	Provide access to high-quality prekindergarten programs for all children, especially those who are economically disadvantaged
Detailed	Access	Expand access to low-income children (i.e., those eligible for free or reduced-price meals [FRPMs]) over 5-year period through direct grants to families Target universal access in communities with high concentrations of low-income students Provide start-up and facility grants	Construct new prekindergarten facilities, especially in low-income communities and areas with low-performing schools, and provide repair and renovation funding for existing programs Expand full-day, full-year services
	Delivery	Establish developmentally appropriate preschool learning standards aligned with K-3 standards Use one set of regulations for all providers, regardless of funding source Use a single financing structure for reimbursement, regardless of funding source	Establish developmentally appropriate preschool learning standards linked to an intentional curriculum, with specific attention to culturally and linguistically appropriate curricula for ELLs Improve alignment of P-12 system Limit classrooms to 20 children and one lead and one associate teacher Within 8 years of program establishment, require lead teachers to have a B.A. with 24 ECE units for programs and associate teachers to have 60 units with at least 24 ECE units Incorporate family-literacy, parent-education, and parent-involvement programs Include children with special needs

Table 1.3—Continued

Recommendation		Governor’s Committee on Education Excellence	California P–16 Council
Detailed (continued)	Quality	Invest in training of preschool staff, standardize training requirements, and make courses transferable Use data to monitor provider performance and to provide information to parents Over three years, phase in a standard-based QRS Implement tiered reimbursement system tied to quality	Enhance workforce recruitment and preparation through a comprehensive professional development system Create quality improvement system and tiered reimbursement Implement result-based accountability based on outcome assessment using appropriate measurement tools
	Other	Over a three-year period, delay the age of kindergarten entry to September 1	Compensate teachers and associate teachers on par with K–12 teachers and aides Include prekindergarten in statewide longitudinal data system

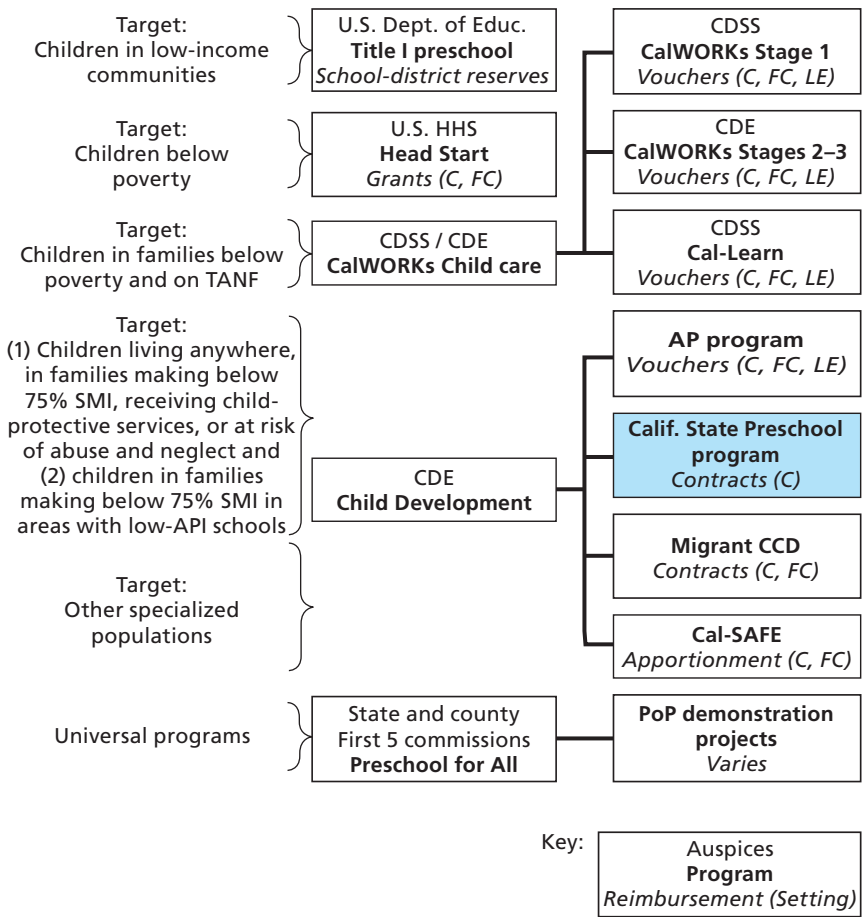
SOURCE: Author’s analysis based on Governor’s Committee on Education Excellence (2007a, 2007b) and California P–16 Council (2008).

illustrates how the new California State Preschool program fits into the structure of publicly funded ECE programs in California that serve preschool-age children. Although the shaded box replaces five previous boxes (see Figure 2.1 in Karoly, Reardon, and Cho, 2007a), the system still remains complex.⁸

Under SB 1629, the Early Learning Quality Improvement System Advisory Committee is tasked with making recommendations for improving the quality of ECE programs from birth through age five, including how to assess quality. The committee will recommend the form of the state Early Learning Quality Improvement System, which is expected to include a quality rating scale and a funding model that provides incentives for publicly funded programs to achieve and

⁸ See Karoly, Reardon, and Cho (2007a) for details on how the programs listed in Figure 1.1 are part of a broader system of subsidized child care and development programs serving children from birth to age 12.

Figure 1.1
Publicly Funded ECE Programs Serving Preschool-Age Children in California



SOURCE: Karoly, Reardon, and Cho (2007a, Figure 2.1).
NOTE: CDSS = California Department of Social Services. C = licensed center. FC = licensed family child-care home or network. LE = license-exempt, home-based provider. AP = Alternative Payment. HHS = U.S. Department of Health and Human Services. CDE = California Department of Education. SMI = state median income. API = academic-performance index. Cal-SAFE = California School Age Families Education. PoP = Power of Preschool.

maintain quality through, for example, a tiered reimbursement system tied to the rating scale. The legislation also calls on the committee to make recommendations regarding the potential to use existing federal, state, local, and private resources, including funds from the California Children and Families First Act of 1998 to complement the funding model and promote quality.

Finally, under existing law, the California Department of Education (CDE) is developing the California Education Information System and the California Longitudinal Pupil Achievement Data System (CALPADS).⁹ SB 1298 broadens the K–12 system to create a P–16 data system that incorporates information from center-based child care and development programs under the purview of local education agencies serving children before kindergarten entry, as well as data from postsecondary institutions in the California Community Colleges, University of California, and California State University systems. The preschool and postsecondary data systems would use the same unique student identifiers employed in the longitudinal data system that presently begins in kindergarten. The bill did not include funding to implement the system, but a working group is charged with creating a strategic plan to generate the linked data system.

Another recent development, consistent with the recommendations of both the Governor's Committee on Education Excellence and the California P–16 Council, was the finalization of the first volume of the California Preschool Learning Foundations by the CDE Child Development Division. This first volume provides educators and parents with age-appropriate expectations about the range of knowledge and skills children obtain in high-quality preschool programs in four key domains: socioemotional development, language and literacy, English-language development, and mathematics. Subsequent foundations will cover visual and performing arts, physical development, health, history, social science, and science. The foundations in the first volume have been aligned with the state's kindergarten content stan-

⁹ A related education data system is the California Longitudinal Teacher Integrated Data Education System (CALTIDES), which will collect information on teacher credentials and other data that can be matched to student-level records.

dards in the same subject areas (e.g., English-language arts and mathematics). Children's progress toward the learning foundations will be assessed using the Desired Results Developmental Profile, revision 2 (DRDP-R2). The foundations will be required for use in state Title 5 programs and optional for other public and private programs.

Organization of This Monograph

With this background, in Chapter Two, we address our first three research questions regarding adequacy and efficiency of preschool education in California: the size of achievement gaps in the early elementary grades and the potential for preschool to narrow existing gaps; the extent to which preschool-age children in California participate in early-learning programs and the quality of the settings they are in; and the features of the existing system of publicly funded ECE programs for preschool-age children in California and the potential for efficiency gains in a modified system. The answers to these questions derive from the findings gleaned from the three focused studies that preceded this monograph.

In Chapter Three, we begin to address the fourth research question by examining the advantages and disadvantages of various design options for specifying preschool access, providing program services, ensuring high quality, and promoting efficiency through other aspects of program infrastructure. In some cases, there is no clear research basis for adopting one policy approach or another, and it will be up to policymakers and the public to express their preferences based on how they weigh the advantages and disadvantages of various options. In other cases, a stronger argument can be made for one approach over another.

To complete our answer to the fourth research question, we draw on the design considerations to offer a series of recommendations, outlined in Chapter Four, for improving the adequacy and efficiency of preschool education in California. The specific recommendations for policy action include those that are possible with existing resources,

as well as those that are possible only by making more resources available.

Chapter Five summarizes what we have learned about preschool adequacy and efficiency in California and highlights both policy considerations associated with advancing preschool adequacy and efficiency and the cumulative set of recommendations. Broader implications of the recommendations are also discussed.

Adequacy and Efficiency of Preschool Education in California

In support of our study of preschool adequacy and efficiency, we conducted three in-depth studies designed to do the following:

- Measure the gaps in school readiness and academic achievement in the early grades among California's children and assess the potential for high-quality preschool education to narrow readiness and achievement gaps (Cannon and Karoly, 2007b).
- Assess the nature and quality of the ECE arrangements for California's preschool-age children—those who are one or two years away from kindergarten entry (Karoly, Ghosh-Dastidar, et al., 2008a).
- Examine the system of publicly funded ECE programs in California that serve children in the two years prior to kindergarten entry (Karoly, Reardon, and Cho, 2007a).

In this chapter, we synthesize the results from those three studies, as well as other relevant research, to highlight what we know about the adequacy and efficiency of preschool education in California. In addition, using the estimates of achievement gaps by third grade in California and the evidence of the potential gains in test scores associated with high-quality preschool (Cannon and Karoly, 2007b) and our estimates of current enrollment of California four-year-olds in center-based ECE programs (Karoly, Ghosh-Dastidar, et al., 2008a), we calculate the share of academic achievement gaps in third grade that could be narrowed by various approaches to raising preschool enrollment and quality.

In brief, this body of research supports the following conclusions:

- There are sizable gaps in student achievement in English-language arts and mathematics when California students are first assessed statewide in second and third grades, and some groups of students demonstrate even larger deficits in academic proficiency.
- These achievement gaps have earlier roots. According to various California-specific data we assembled to measure achievement in earlier grades and school readiness, the same groups of students who are behind by second and third grades were also behind in kindergarten and first grade, and even at the time of kindergarten entry.
- If California policymakers want to find solutions for addressing achievement gaps, it is logical to consider whether one potential approach is to implement policies that will help narrow the gaps present at the starting gate, when children first enter the K–12 education system. In this regard, we find solid evidence from rigorous evaluations of smaller- and larger-scale preschool programs that well-designed programs can advance school readiness, raise academic achievement, and improve other education outcomes in the elementary-school years and beyond.
- The potential for preschool to narrow California’s student achievement gaps depends on the extent to which low-performing students already participate in high-quality preschool programs. Data collected in 2007 by the study team from a representative sample of about 2,000 California families about their preschool-age children’s ECE arrangements shows that participation in center-based ECE programs (versus care provided in a home setting by a relative or nonrelative) is the norm overall for California’s preschool-age children. However, the additional interview and observation data collected from those families’ providers about the features of the care and learning environments they provide indicate that, depending on the metric of quality, participation in *high-quality* center-based programs is not the norm. The quality gap is especially evident for measures that capture the extent to which teach-

ers promote language development and the higher-order thinking skills that help prepare children for kindergarten. Other aspects of quality with room for improvement are teacher education and training, use of research-based curricula, and health and safety. Programs were more successful in meeting benchmarks for high-quality programs (e.g., those promulgated by NAEYC as part of its accreditation criteria) for group sizes and child-staff ratios and scored higher on measures of the classroom environment that focus on emotional support, classroom management, and student engagement.

- The high rate overall of participation in center-based preschool programs masks substantial differences for subgroups of children. Socioeconomically disadvantaged children—the ones who could benefit the most from such programs because they start out behind and stay behind—participate at considerably lower rates than their more advantaged peers. At the same time, differences in measures of quality across children in different socioeconomic or demographic groups, if any, are modest. In other words, for such program features as child-staff ratios (for which quality is relatively high, on average), most groups of children in center-based programs experience similar levels of quality. For such program features as teacher instructional support (for which quality is lower, on average), the low levels of quality are found across all groups. However, the lower rates of participation in preschool of any quality for more-disadvantaged children combined with the lower levels of quality on key dimensions important for promoting school readiness mean that the children who could benefit most are the least likely to participate in programs with features that are likely to provide the strongest developmental benefits.
- Our finding that at-risk preschool-age children are underserved in high-quality early-learning programs is not surprising in light of the structure of California's system of publicly funded ECE programs for children one or two years away from kindergarten entry. The current system, which is designed to serve lower-income and at-risk children, is a complex set of programs that are underfunded and not structured to promote or reward providers

that achieve high quality. The inefficiencies in the current system represents a lost opportunity to use the public resources that California invests in ECE to achieve the maximum benefits in terms of child development and school readiness.

- The information assembled on achievement gaps, preschool participation rates, and the effectiveness of well-designed preschool programs allows us to assess the potential effects on achievement gaps of increasing preschool participation rates, raising preschool quality, or both. Focusing on racial-ethnic achievement gaps, our analysis shows almost no benefit in terms of narrowing observed gaps from just raising preschool participation for all groups without any change in preschool quality. Rather, the largest *absolute* gain in test scores for Latinos and African Americans is associated with raising preschool participation and preschool quality for all groups of children. The estimated gain ranges from one-fifth to one-third of the size of the existing score gaps, depending on assumptions. However, since nonminority children would also benefit with a universal approach, the largest *relative* gain in student achievement for Latinos versus whites and for African Americans versus whites is associated with targeted increases in participation and quality for socioeconomically disadvantaged children. With this targeted policy approach, the estimates suggest that the racial-ethnic achievement-score gap could be narrowed by about 10 to 20 percent, depending on assumptions.

There Are Sizable Deficits in Student Achievement by Second and Third Grades and Even Larger Gaps for Some Groups

The California Standards Test (CST) is used to measure whether students have achieved proficiency in key subjects based on the state's education content standards. These statewide assessments are first given in the spring of second grade, and we examined CST results for both second and third grades (Cannon and Karoly, 2007b). In 2007, 52 percent of second-grade students and 63 percent of third-grade students did not achieve grade-level proficiency in English-language arts. The

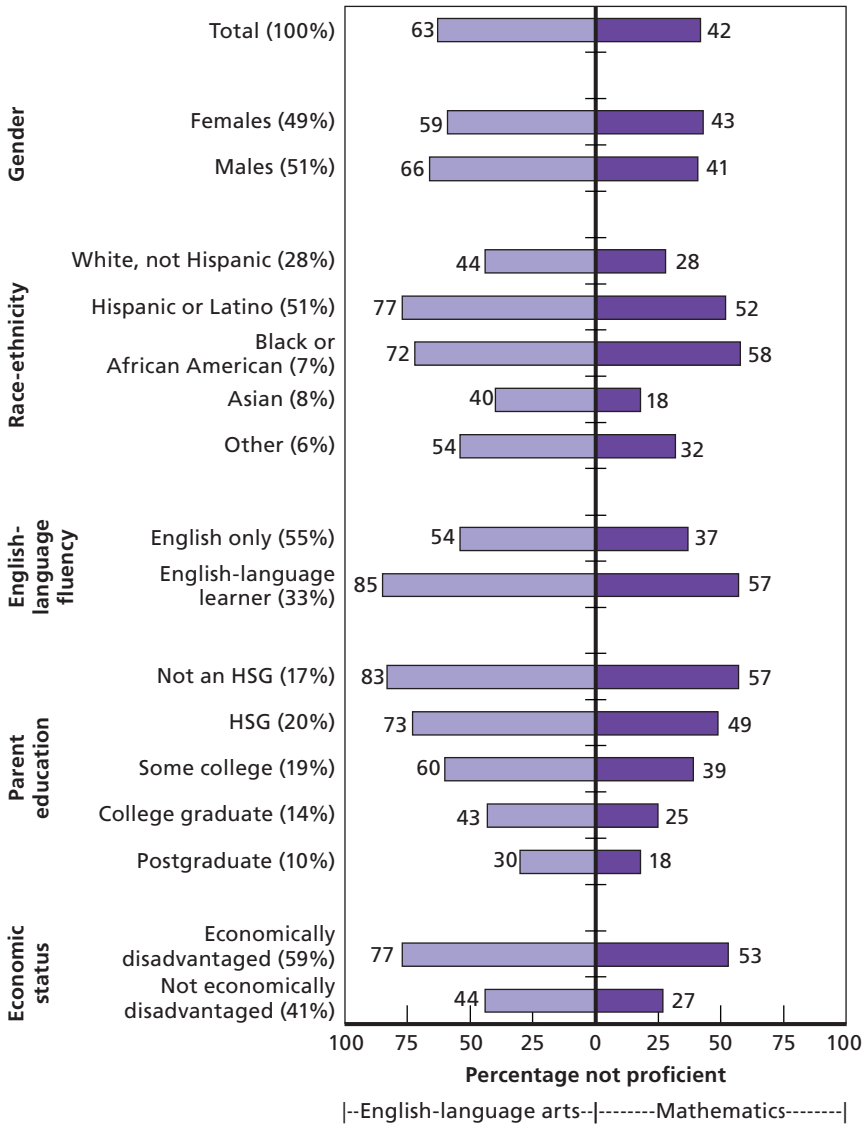
equivalent percentages for math performance in the same grades were somewhat better but still quite high at 41 and 42 percent. These percentages translate into approximately 240,000 second-grade students and 290,000 third-grade students statewide who do not have the recommended skills in terms of English-language arts. The populations of students performing below proficiency in math are about 187,000 second-graders and 198,000 third-graders.

These averages mask substantial differences in proficiency for different groups of students. Lower academic performance in second and third grades is consistently evident for ELLs, Latinos and African Americans, students from economically disadvantaged homes, and students whose parents have low levels of education.¹ For example, as shown in Figure 2.1, the proportion of Latinos and African Americans who do not meet proficiency in English-language arts as of third grade reaches 77 and 72 percent, respectively, compared with 44 percent for non-Hispanic whites. The percentage-point gap between ELLs and English-only students and between students who are economically disadvantaged and those not economically disadvantaged is about the same magnitude, whereas the gap reaches 53 percentage points between students with the lowest and highest levels of parental education. Although the gaps are somewhat smaller in mathematics proficiency in the same grade, the pattern of differentials is similar.

It is also worth noting that, even for more-advantaged students, who may be expected to perform well, there is still a nontrivial fraction who fail to meet proficiency. For example, in third grade, 44 percent of students from non-economically disadvantaged backgrounds and 30 percent of those whose parents have education beyond a college

¹ ELLs are those who do not demonstrate listening, speaking, reading, and writing proficiencies in English that are sufficient for participation in the regular school program as assessed using the California English Language Development Test (CELDT). When non-native English-speaking students enter the California public school system, they are given the CELDT to gauge English-language fluency. ELLs then take the CELDT annually until they are redesignated fluent-English proficient based on CELDT scores and other factors determined by the school district. Economically disadvantaged students are those whose parents did not graduate from high school or who are eligible for the National School Lunch Program (NSLP), which means that family income is at or below 185 percent of the federal poverty line.

Figure 2.1
Percentage Not Proficient in Third Grade, by Student Characteristics:
English-Language Arts and Mathematics CST for 2007



SOURCE: Cannon and Karoly (2007b, Figures 2.3 and 2.5).

NOTE: HSG = high-school graduate.

degree do not achieve proficiency in English-language arts. Even for these more advantaged students, California has some distance to go before reaching of the goal of having all students attain proficiency at each grade level in key subjects, such as English-language arts and mathematics.

These differences, evident in Figure 2.1, as well as those documented in Cannon and Karoly (2007b) for second grade, cannot be explained away when we account for compositional differences, such as the fact that the group of Latino children has a large fraction of ELLs or those classified as economically disadvantaged. When we adjust for such compositional differences, the between-group gaps in achievement are generally smaller, but they are not eliminated. Although the set of child and family characteristics for which we can adjust is limited, our results suggest that there are meaningful, independent differences in student achievement across students defined by race-ethnicity, English-language fluency, parental education, and economic status.

The Achievement Gaps Evident in the Early Elementary Grades Have Earlier Roots

For many, the existence and magnitude of the academic achievement gaps in the early grades and beyond are well known, since CST data are widely examined. What is less well documented is that very similar patterns are evident in standard-based assessments conducted at the end of kindergarten and first grade and in measures of school readiness obtained at kindergarten entry. In other words, the gaps in student achievement that receive so much attention at key junctures, such as fourth and eighth grades, are present when children in California enter school, with the same subgroups of children who start out behind remaining behind as they progress through school.

In the absence of statewide representative data on student assessments before second grade, Cannon and Karoly (2007b) assembled data from several sources to examine the pattern of achievement differences between groups of students, rather than the absolute level of achievement gaps. The assessments at the end of kindergarten and first grade

are available for reading performance only and then only for a subset of school districts in the Reading First program that agreed to make their data available; no consistent, standard-based math assessments are conducted across California districts at the end of these grades. These data show a similar pattern of who is ahead and who is behind, in terms of achieving grade-level reading proficiency at the end of kindergarten and first grade, as we see in the statewide assessments from second and third grade. For example, ELLs trail those who are English only; African American and Latino students are behind whites, and boys tend to lag girls.

Assessments of school readiness conducted for a statewide sample of California children in the Early Childhood Longitudinal Study, Kindergarten Class of 1998–99 (ECLS-K) also show similar gaps between groups of students entering kindergarten on measures of approaches to learning and developmental school-readiness skills. These results for California children are consistent with other research documenting school-readiness gaps that persist or even widen as children advance through the elementary grades and beyond (see, for example, Reardon, 2003; Fryer and Levitt, 2004, 2005; Rumberger and Anguiano, 2004; Reardon and Galindo, 2006).

High-Quality Preschool Can Improve School Readiness and Raise Student Achievement, Especially for More-Disadvantaged Students

What, then, is the potential for preschool to help narrow these differences in school readiness and student achievement? Cannon and Karoly's (2007b) review of the rigorous evaluations of high-quality preschool programs demonstrates that well-designed programs that serve children one or two years before kindergarten entry can improve measures of school readiness, raise performance on academic achievement tests in the early elementary grades, generate sustained effects on academic achievement into the middle-school years, and produce other education gains, such as reduced special-education use and grade

repetition and higher rates of high-school graduation.² These effects have been demonstrated for smaller-scale model programs, but also for larger-scale, publicly funded programs currently operating in a number of states.

Effective Preschool Programs Produce Sizable Effects on School Readiness

Table 2.1 summarizes the estimated effects of various preschool programs with experimental or quasi-experimental evaluations that have measured differences between program participants and nonparticipants at kindergarten entry.³ The measures of school readiness shown in the table columns include the Peabody Picture Vocabulary Test (PPVT) (various editions), a measure of receptive vocabulary that is predictive of general cognitive abilities; three subtests of the Woodcock-Johnson tests of achievement (various editions) that measure prereading or reading skills (the Letter-Word Identification subtest), prewriting or spelling skills (the Spelling subtest), and premath reasoning (the Applied Problems subtest); and a composite kindergarten-readiness measure (namely, the Iowa Tests of Basic Skills Early Primary Battery, which measure listening, language, and mathematics concepts). The programs evaluated shown in the table rows include the small-scale Perry Preschool evaluation, the evaluation of the Chicago Child-Parent Centers (CPC) program implemented in the Chicago Public Schools, the nationwide Head Start experimental evaluation, and evaluations of statewide preschool programs in Arkansas, California (evaluated only for programs in Fresno, Los Angeles, and Sacramento), Michigan, New Jersey, New Mexico (evaluated in two different program years), Oklahoma (evaluated both statewide and in Tulsa), South Carolina, and West Virginia.⁴

² Other recent reviews of preschool program effects are provided by Fuller, Bridges, and Pai (2007); Gormley (2007); and Barnett (2008). Recent, formal meta-analyses of the effects of preschool programs are provided by Anderson et al. (2003); Nelson, Westhues, and MacLeod (2003), and Camilli et al. (2010).

³ All of the estimated program impacts reported in this chapter are estimates of *treatment on the treated*—the programs' effects on those who actually participate.

⁴ With the exception of the results for Arkansas (Hustedt, Barnett, Jung, and Thomas, 2007), California (Barnett, Howes, and Jung, forthcoming), and New Mexico (Hustedt,

Table 2.1
Estimated Effects of Preschool Programs on School Readiness

Program	Evaluation Method	Effect Size				
		Vocabulary (PPVT)	Woodcock-Johnson Subtest			Readiness Composite
			Letter-Word Identification	Spelling	Applied Problems	
Perry Preschool	E	1.02*	—	—	—	—
Chicago CPC	QE	—	—	—	—	0.46*
Head Start	E	0.08	0.32*	0.24*	0.15	—
Arkansas	QE	0.36*	—	—	0.24*	—
California	QE ^a	0.30*–0.47*	—	—	0.31*–0.38*	—
Michigan	QE	0.03	—	—	0.51*	—
New Jersey	QE	0.34*	—	—	0.19*	—
New Mexico, year 1	QE	0.36*	—	—	0.39*	—
New Mexico, year 2	QE	0.25*	—	—	0.50*	—
Oklahoma, Tulsa only	QE	—	0.79*	0.64*	0.38*	—
Oklahoma, statewide	QE	0.32*	—	—	0.49*	—

Table 2.1—Continued

Program	Evaluation Method	Effect Size				
		Woodcock-Johnson Subtest				
		Vocabulary (PPVT)	Letter-Word Identification	Spelling	Applied Problems	Readiness Composite
South Carolina	QE	0.05	—	—	—	—
West Virginia	QE	0.18	—	—	0.52*	—

SOURCES: Cannon and Karoly (2007b, Tables 4.2, 4.3, 4.4, and 4.5); Hustedt, Barnett, and Jung (2007, Figure 4); Hustedt, Barnett, Jung, and Thomas (2007, Figure 4); Hustedt, Barnett, Jung, and Figueras (2008, Figure 1); and Barnett, Howes, and Jung (forthcoming, Table 12).

NOTE: The effect sizes are for the treatment-on-treated program impacts. Estimate for Perry Preschool are after the end of the first program year for children who entered at age three or age four. Estimate for Chicago CPC is the lower bound from various estimation methods that control for potential selectivity bias. Estimates for Head Start are after the first program year for children who entered the program at age four. Estimates for Oklahoma, Michigan, New Jersey, South Carolina, and West Virginia are based on the pooled sample regression discontinuity model. E = experimental. QE = quasi-experimental. * = statistically significant at the 5-percent level or better. — = not available.

^a The range of estimates is based on alternative model specifications using the regression discontinuity design methodology. See Barnett, Howes, and Jung (forthcoming) for details.

The number (or range of numbers) reported in each table cell is the program's impact on a given readiness indicator measured as an effect size, a standardized measure of program impact that is independent of the unit of measurement and therefore facilitates comparisons across different outcome measures.⁵

Not all program evaluations measured the full set of readiness indicators listed in Table 2.1, but, with a few exceptions, when an indicator was measured, the effect was statistically significant. The magnitudes of the statistically significant effect sizes are typically in the 0.2 to 0.3 range but extend to effect sizes of 0.5 in the Chicago CPC program, California, Michigan, New Mexico, and West Virginia; 0.8 in the Tulsa, Oklahoma, program; and 1.0 in Perry Preschool—magnitudes that are generally considered large in the context of other education interventions. Some of the differences in effect sizes may be attributable to differences in program features, such as the demographic composition of the children served, program intensity (part versus full day), and other program design features (e.g., requirements for class size, child-staff ratio, teacher education and training) (see Cannon and Karoly, 2007b, Table 4.1, for a summary of some of these program differences).

Notably, the results reported for California in Table 2.1, generated by Barnett, Howes, and Jung (forthcoming), represent one of the first larger-scale evaluations of the effects on school readiness of a California Title 5–subsidized program. In this case, California State Preschool programs in Fresno, Los Angeles, and Sacramento were included in the study, which used several statistical methods to estimate program effects, including the same quasi-experimental evaluation approach

Barnett, and Jung, 2007; Hustedt et al., 2008), all of these evaluations were covered in Cannon and Karoly (2007b). The results for these three states became available after that analysis was published.

⁵ The effect size is usually calculated as the ratio of the program effect (the difference in means between the treatment and control groups, in the case of an experimental evaluation) divided by the standard deviation of that effect estimate (i.e., the pooled standard deviation in a difference of means). In some cases, effect sizes are calculated using the standard deviation of the control-group mean in the denominator. Generally, an effect size of 0.2 is considered to be small, 0.5 to be medium, and 0.8 to be large, although, in comparison to the impacts of other education interventions, effect sizes of 0.3 to 0.5 are viewed as reasonably large (see Crane, 1998).

used in the other state preschool program evaluations listed in Table 2.1. While some caution is warranted about the generalizability of the findings to the full set of programs operating statewide, the findings indicate that the California State Preschool program generates effects on school readiness that are comparable to many other publicly funded state programs, although there is room for improvement to reach the program effects attained by the most-effective programs.

Effective Preschool Programs Sustain Early Benefits Over Time

Two of the programs in Table 2.1 have been following participants and nonparticipants into adulthood: Perry Preschool to age 40 and Chicago CPC to age 21. These evaluations provide a gauge of the potential persistence of benefits from high-quality preschool programs into the early elementary grades and beyond. Table 2.2, for example, reports effect sizes for these two programs on several measures of academic achievement in the first four elementary grades. Counter to the common belief of preschool benefit fade-out, the Perry Preschool achievement effect sizes hover around 0.3 and are statistically significant as of third grade, whereas the Chicago CPC effects are equally sizable and significant through second grade.⁶

There is evidence from these programs that benefits extend into later grades as well. Table 2.3 reports effect sizes for Perry Preschool and Chicago CPC for achievement tests in middle school (grade 6 or 8), along with other measures of education success, such as grade retention, special-education use, and high-school graduation. With one exception, the effects of participation in these two preschool programs are statistically significant, with effect sizes that range from 0.2 to 0.4—again, meaningful gains in the context of education initiatives. For example, the 0.4 effect size in Perry Preschool for the high-school graduation rate equates to a 21-percentage-point advantage in the graduation rate for the preschool participants compared to the control group. The

⁶ These effect sizes for achievement scores in second and third grades, as well as those reported at older ages for later grades, are as large, if not larger, than those that have been measured for other education interventions, such as peer-tutoring programs and class-size reduction (Karoly, Kilburn, and Cannon, 2005).

Table 2.2
Effect Sizes of Perry Preschool and Chicago CPC on Student Achievement in Kindergarten to Third Grade

Program and Achievement Measure	Grade			
	Kindergarten	First Grade	Second Grade	Third Grade
Perry Preschool				
Composite ^a	0.32*	0.18	0.28	0.29*
Reading ^b	0.28	0.15	0.25	0.24
Mathematics	—	0.20	0.27	0.31*
Language	—	0.08	0.20	0.33*
Chicago CPC				
Composite	0.42*–0.58*	—	—	0.04–0.21*
Reading	0.35*	0.51*	0.35*	0.09
Mathematics	0.46*	0.26*	0.35*	0.13

SOURCE: Cannon and Karoly (2007b, Table 4.5).

NOTE: For Perry Preschool, the achievement measures are from the California Achievement Tests (except as noted), and effects are adjusted for child gender, Stanford-Binet Intelligence Scales at study entry, mother’s schooling, mother’s employment, whether father is at home, father’s occupation status, and household rooms per person. For Chicago CPC, the achievement-score measure is the Iowa Tests of Basic Skills. The effects for the composite score show the range of effect sizes for various estimation methods that control for potential selectivity bias. See Reynolds and Temple (1995). The effects for reading and mathematics control for child gender and age, parent education, lunch subsidy, parent expectations, and primary grade intervention. * = statistically significant at the 5-percent level or better. — = not available.

^a For kindergarten, the effect size is for the Stanford-Binet Intelligence Scale.

^b For kindergarten, the effect size is for the PPVT.

comparable figure for Chicago CPC is an 8-percentage-point advantage. Compared with nonparticipants, rates of special-education use among preschool participants were lower by 12 and 10 percentage points, respectively, in the two programs. The significant reduction in grade repetition in Chicago CPC equaled 15 percentage points.

Table 2.3
Effect Sizes of Perry Preschool and Chicago CPC on
Longer-Term Education Outcomes

Outcome and Program	Effect Size
Academic achievement	
Perry Preschool (reading for grade 6)	0.34*
Perry Preschool (mathematics for grade 6)	0.33*
Chicago CPC (reading for grade 8)	0.24*
Chicago CPC (mathematics for grade 8)	0.23*
Grade retention	
Perry Preschool (by age 27)	-0.15
Chicago CPC (by age 15)	-0.34*
Special-education use	
Perry Preschool (by age 19)	-0.29*
Chicago CPC (by age 18)	-0.26*
High-school completion	
Perry Preschool (by age 27)	0.43*
Chicago CPC (by age 22–24)	0.16*

SOURCE: Cannon and Karoly (2007b, Table 4.7).

NOTE: For Perry Preschool, the achievement measures are from the California Achievement Tests, and effects are adjusted for child gender, Stanford-Binet Intelligence Scales at study entry, mother's schooling, mother's employment, whether father is at home, father's occupation status, and household rooms per person. For Chicago CPC, the achievement-score measure is the Iowa Tests of Basic Skills. The effects for reading and mathematics control for child gender and age, parent education, lunch subsidy, and primary grade intervention, among other factors. * = statistically significant at the 5-percent level or better.

Effective Preschool Programs Promote School Readiness for Students from Diverse Backgrounds

Except for Oklahoma's preschool program, which is free and available to all four-year-olds in the state, and West Virginia's program, which

is expanding toward universal access, the preschool programs shown in Table 2.1 target more-disadvantaged children, such as those from low-income families, those in low-income neighborhoods, or those meeting other criteria associated with higher risk of school failure. Thus, the weight of the evidence for favorable effects of high-quality preschool programs, especially the longer-term education gains shown in Tables 2.2 and 2.3, comes from more-targeted programs. However, the evaluation of Oklahoma's universal program provides an opportunity to see whether students from diverse backgrounds can benefit from high-quality preschool.⁷

To address this issue, Figure 2.2 charts effect sizes for the three measures of school readiness available in the Tulsa, Oklahoma, evaluation (the same subtests of the Woodcock-Johnson inventory shown earlier in Table 2.1), now disaggregated by student characteristics. The effect for all students is the same as that reported in Table 2.1. With a few exceptions, when results are disaggregated by race-ethnicity and economic status, the significant effects are replicated for every group.⁸ The effect sizes tend to be larger for some groups than others—Latinos and those eligible for FRPMs—but the beneficial effects of the program in terms of school readiness are shared across the socioeconomic spectrum.⁹

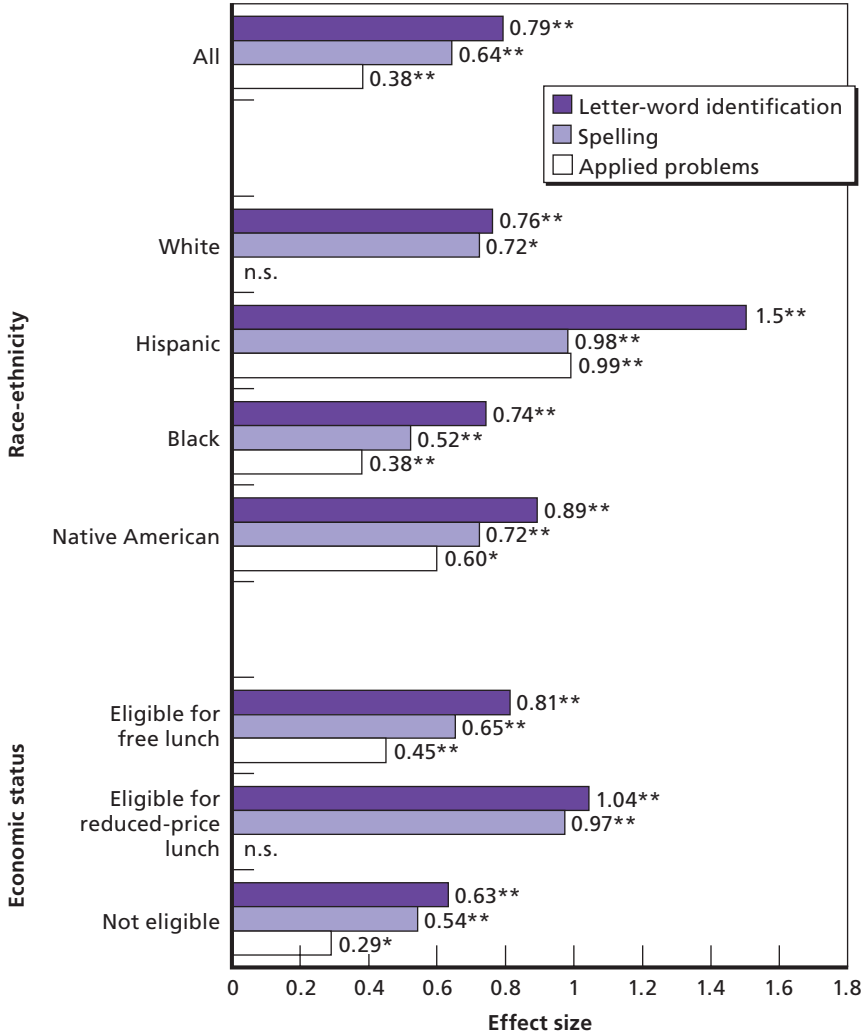
One limitation of this literature is that we have less information about the potential benefits of high-quality preschool for ELLs, an important population in California with consistently low academic performance. This is largely because this subgroup has not been a focus of the more rigorous research examining the effects of preschool

⁷ Although available to all children, the population of children in the Tulsa Public Schools service area is more disadvantaged than the state population overall. Thus, the results reflect those for an urban school district with racial-ethnic minorities in the majority.

⁸ The measure of economic status differentiates students by NSLP eligibility for a free lunch (family income at poverty level or below) or reduced-price lunch (family income between 100 and 185 percent of poverty level).

⁹ Even though effect sizes appear larger for some groups than for others, the nature of the evaluation method used for the Tulsa, Oklahoma, program does not support conclusions that the expected benefit of the program will be larger for a representative child from one subgroup than for a representative child from another group. See Gormley et al. (2005).

Figure 2.2
Effects of Tulsa, Oklahoma, Preschool Program on School Readiness, by
Subgroup



SOURCES: Cannon and Karoly (2007b, Table 4.5).

NOTE: Results are for subtests of the Woodcock-Johnson battery. ** = statistically significant at the 5-percent level. * = statistically significant at the 10-percent level. n.s. = not significant at the 10-percent level.

compared with no preschool. However, evidence from the careful evaluation of Oklahoma's universal preschool programs shows favorable effects on school readiness for some groups of Hispanic ELLs (see Figure 2.2 and Gormley, 2008, for more detail). In addition, other research comparing alternative approaches to teaching ELLs suggests that the benefits to preschool are at least as large as, if not larger than, they are for English-only children (see, for example, Barnett, Yarosz, et al., 2007; Ballantyne et al., 2008).

Preschool Participation Is the Norm, but High-Quality Preschool, with Features That Promote School Readiness, Is Not

This scientifically sound body of evidence demonstrating meaningful benefits from high-quality preschool programs suggests that preschool may be a promising strategy for addressing California's dual gaps in school readiness and student achievement. To assess the potential for preschool to narrow these gaps, we need to determine the extent to which children in low-performing groups already participate in high-quality early-learning programs. If their participation is low, it suggests that there is scope for increasing access to programs that could better prepare children for school and raise subsequent academic performance. If participation is already high, it suggests that there is less of an opportunity for preschool to make a large difference.

To assess the extent of current participation in various ECE settings and the quality of those experiences, the study team collected information through a telephone survey in the first half of 2007 from a representative sample of 2,025 California families with a child eligible to enter kindergarten in the fall of 2007 or 2008 (Karoly, Ghosh-Dastidar, et al., 2008a). We also conducted telephone interviews with the center-based providers that families use, completing interviews with the director or lead classroom teacher (often both) in more than 600 center-based programs. For a random sample of 250 of those center-based programs, we also had trained observers visit the classroom to collect objective assessments of the setting, such as observed group size, child-

staff ratios, health and safety practices, classroom resources, the nature of the interactions between teachers and children, and the learning supports that teachers provide.¹⁰ The data collected were designed to incorporate several features not available from existing sources: a representative sample of California children one or two years away from kindergarten entry, the ability to identify kindergarten-entry cohorts, detailed information on the range of nonparental ECE arrangements, objective measures of ECE program quality, and sufficient sample sizes to analyze ECE utilization and quality for key population subgroups.

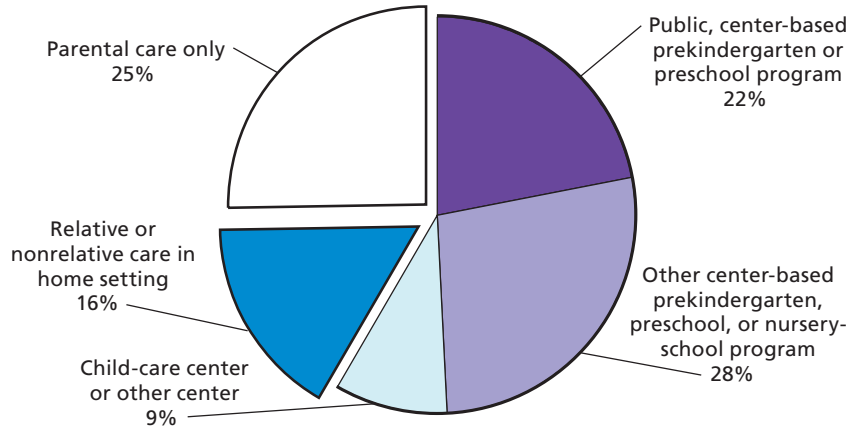
Participation in Center-Based ECE Is the Norm for California Preschoolers

The information collected from the parent interviews demonstrate that, in getting ready for school, time in nonparental ECE arrangements—especially center-based programs—is the norm in California. The estimates from our study indicate that nearly three out of every four preschool-age children in California have one or more regular nonparental ECE arrangements, and most of those children (59 percent) have at least one center-based arrangement. As shown in Figure 2.3, according to provider responses, most of these center-based programs (50 out of 59 percent) can be labeled preschool, prekindergarten, or nursery-school programs, as opposed to child care or other custodial care (9 out of 59 percent).

Among four-year-olds, participation rates are even higher, reaching nearly 80 percent in any nonparental ECE, 67 percent in center-based programs in general, and 57 percent in a center-based preschool program. The comparable figures for three-year-olds are 71 percent in any nonparental ECE, 51 percent in center-based settings, and 42 percent in center-based preschools of various sorts.

¹⁰ Additional detail about the survey and observational data can be found in Karoly, Ghosh-Dastidar, et al. (2008a).

Figure 2.3
Percentage Distribution of Preschool-Age Children in California Across ECE Arrangement Types



SOURCE: Karoly, Ghosh-Dastidar, et al. (2008, Figure S.2), based on RAND California Preschool Study household survey and provider survey data.

NOTE: Sample is all children. Sample size is 2,025. When there are multiple ECE arrangements for a child, if there is any center-based ECE, the focal arrangement is the center arrangement with the most weekly hours. Otherwise, the focal arrangement is the home-based setting (relative or nonrelative care) with the most weekly hours. Totals may not sum to 100 because of rounding.

RAND MG889-2.3

Quality Is Mixed in Center-Based Programs

Participation in center-based programs, however, is no guarantee of quality. Our study, like others, has conceptualized quality in center-based ECE settings in terms of both structural and process elements, and there is variation in quality within both domains. Like other studies, our conclusions rest largely on objective assessments of these various dimensions of ECE quality by trained, independent observers, which is particularly important for the process measures, as they are not amenable to self-reports or casual observation.¹¹ For each qual-

¹¹ Barnett, Howes, and Jung (forthcoming) also examine a range of quality measures for the 207 California State Preschool program classrooms in their sample for Fresno, Los Angeles, and Sacramento. While their sample frame differs from ours in terms of geographic coverage (our sample represents the 32 most populous counties in the state, covering 97 percent

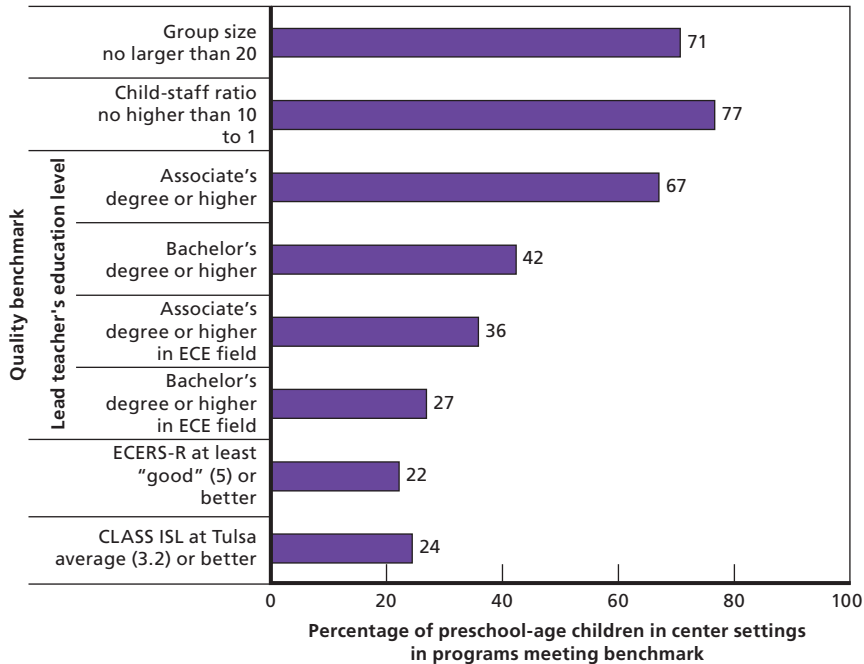
ity dimension, we estimated the fraction of children in center-based settings that would meet well-established benchmarks for quality or a range of benchmarks. These benchmarks are those associated with accreditation criteria, such as those set out by NAEYC and others. In some cases, the benchmarks are based on the levels attained in effective preschool programs.

Structural quality captures such program features as teacher education and training, group size, child-staff or child-adult ratios, curriculum, and health and safety practices. Such measures are more readily observed, and most are regulated by the government through licensing or requirements in publicly funded programs. In terms of structural elements, as seen in Figure 2.4, the fraction of children in center-based settings that meet quality benchmarks is highest for group size and the ratio of children to staff or adults. About 70 to 80 percent of preschool-age children in center-based settings are in programs that have no more than 20 children, on average, when observed, and a child-staff ratio that is, on average, no higher than 10 to 1. Those percentages reach about 90 percent if we set the benchmark for group size at 24 children and use a child-adult ratio of 10 to 1 instead of a child-staff ratio at this benchmark (i.e., volunteers can be included along with staff).

Another key structural element is the education and training of the lead teacher. In this case, there is less of a consensus in the early-childhood field, but most benchmarks that define high-quality programs specify at least an associate's degree, if not a bachelor's degree, and often the degree requirements are combined with specialized ECE training. As shown in Figure 2.4, at best, 67 percent of preschool-age children are in centers that meet a benchmark of having a lead teacher with an associate's degree in any field. That percentage falls to 27 percent if the benchmark is set at a bachelor's degree in the ECE field (the level of training for teachers in proven preschool programs, such as Perry Preschool and Chicago CPC, and what is required in

of preschool-age children) and diversity of provider types (our sample covers both public and private center-based programs), the findings with respect to such measures of quality as group sizes, child-staff ratios, teacher education and training levels, and quality rating scales are very consistent.

Figure 2.4
Percentage of Preschool-Age Children in California in Center-Based ECE Arrangements in Programs Meeting Quality Benchmarks



SOURCE: Karoly, Ghosh-Dastidar, et al. (2008a, Figure S.4), based on RAND California Preschool Study provider survey data and provider observation data.
NOTE: Sample is children in center-based ECE arrangements. Sample size is 615.
CLASS = Classroom Assessment Scoring System.

RAND MG889-2.4

effective state preschool programs, such as Oklahoma’s). Notably, neither California licensing standards under Title 22 nor the standards for the Title 5 state-funded child development programs require a postsecondary degree for the lead teacher. Shortcomings are also evident for other structural elements, such as the use of a research-based curriculum and meeting basic health and safety standards (see Karoly, Ghosh-Dastidar, et al., 2008a, for additional detail).

Process quality encompasses aspects of the environment that define children’s experiences, such as the activities in which they engage, the nature of teacher-child and peer-to-peer relationships, the management

of the classroom and use of time, and teachers' approaches to fostering learning and healthy development. These aspects of quality are more challenging to measure but are usually found to be more predictive of whether a given preschool is preparing children to succeed in kindergarten and beyond. Process quality can be assessed using standardized measurement tools. In our case, we rely on two subscales of the Early Childhood Environment Rating Scale, revised edition (ECERS-R) and the complete CLASS, which have been widely used in other studies of ECE quality. Both the ECERS-R and the CLASS are scored on a scale from 1 to 7, where a score of 3 or lower denotes poor quality and 5 and above indicates good quality.

The highest scores across the ECERS-R and the CLASS that we measured were, on average, for the Emotional Support, Classroom Organization, and Student Engagement domains of the CLASS, all of which were close to or exceeded an average score of 5 for all children in center-based settings. In contrast, the two subscales of the ECERS-R for space and furnishings and activities had a combined average of 4.1, falling short of the "good" label. Indeed, as shown in Figure 2.4, if we use a benchmark score of 5 or higher on the ECERS-R, just 22 percent of California preschool-age children in center-based settings are in programs that would meet that benchmark.

The even-lower average score on the CLASS Instructional Support for Learning (ISL) domain, falling at the low end of the construct (an average of 2.6), is of particular concern, as this domain is one of the strongest predictors of gains in measures of school readiness and later school achievement (Hamre and Pianta, 2005; Howes et al., 2008). In the case of the CLASS ISL domain, we used as a benchmark the average ISL score in Tulsa, Oklahoma's, effective universal preschool program, in which the CLASS has also been measured. The Oklahoma average is 3.2, and we find that just 24 percent of preschool-age children in center-based settings are in programs that would meet that benchmark. Thus, the results from the CLASS indicate that teachers in center-based programs are relatively successful in providing an engaging, emotionally supportive, and well-managed environment for learning but that they are not as successful in promoting higher-order thinking skills, providing quality feedback, and developing students' language capacity.

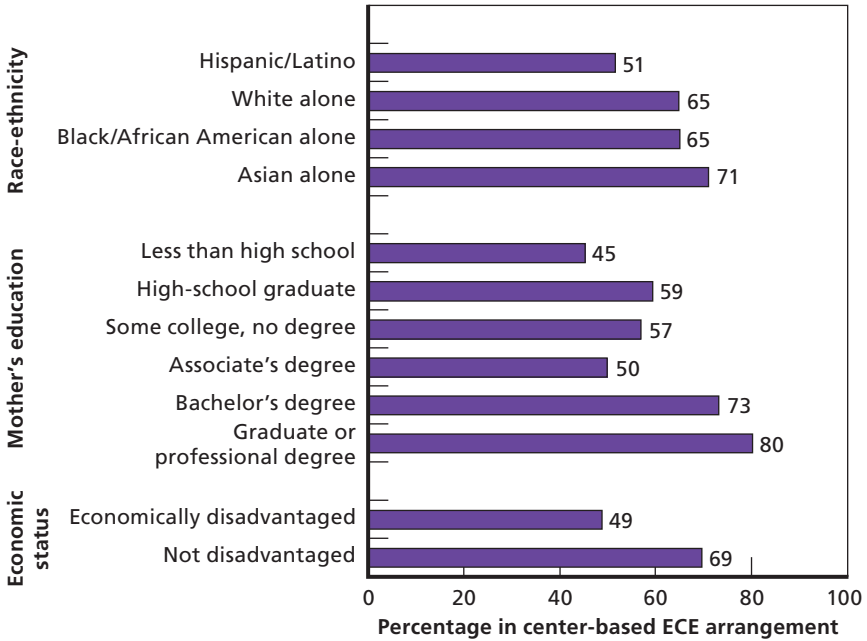
The Children Who Could Benefit Most Are Less Likely to Participate in High-Quality Early-Learning Opportunities

The high rate of utilization of center-based ECE programs masks the often substantial differences in use across groups of children defined by various characteristics. Some of the sharpest contrasts occur between more and less socioeconomically disadvantaged groups. For example, as shown in Figure 2.5, just 45 percent of preschool-age children whose mother has less than a high-school diploma are in center-based programs, compared with 80 percent of those whose mothers have a graduate or professional degree—a 35-percentage-point difference. A strong income gradient means that use of any ECE arrangements and center-based arrangements can be as much as 20 percentage points higher in moving from the low end of the economic ladder to the high end. For instance, among children in economically disadvantaged homes—using the same definition used by CDE to analyze CST results—49 percent participate in center-based programs, compared with 69 percent of those in non-economically disadvantaged homes (see Figure 2.5). When children are classified by race-ethnicity, the lowest rates of utilization of center-based arrangements is found for Latinos (51 percent). Asians have the highest rate of participation in center-based settings (71 percent). These groups with the lowest rates of participation are the same ones identified earlier with the largest gaps in school readiness and subsequent school achievement—the groups that could potentially benefit the most if they had increased access to high-quality early-learning opportunities.

At the same time, the quality shortfalls discussed already for center-based programs in general are evident across the socioeconomic and demographic spectrum. For the most part, a comparison of quality along each of the structural and process dimensions shows modest differences across groups of children classified by various characteristics. No groups stood out, especially on those dimensions on which shortfalls were the largest, such as the ECERS-R and the CLASS, as having high quality on average.

Figure 2.5

Percentage of Preschool-Age Children in California in Center-Based ECE Arrangements, by Characteristic



SOURCE: Karoly, Ghosh-Dastidar, et al. (2008a, Figure S.3), based on RAND California Preschool Study household survey data.

NOTE: Sample is all children. Total sample size is 2,025. For mother's education, the associate's degree category includes those with a vocational/technical diploma and the bachelor's degree category includes those who have some postbaccalaureate education but no degree. A joint test of the null hypotheses that use of center-based ECE is equal across groups is rejected at the 5-percent level of significance for each characteristic.

RAND MG889-2.5

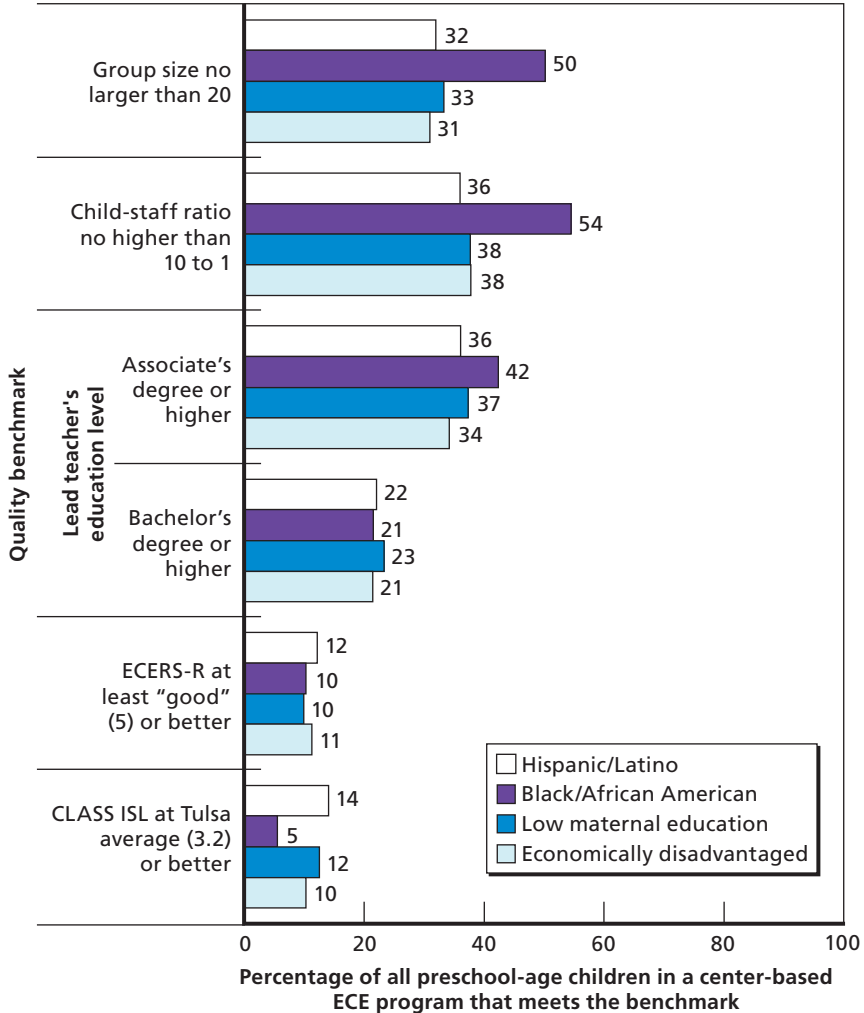
To the extent that differences across groups exist, they are largest for children defined by race-ethnicity and, to a lesser extent, by income relative to poverty. By race-ethnicity, quality measures tended to be the lowest for African Americans and highest for whites; Latinos sometimes had better outcomes and Asians scored on both the high and low ends. For some quality dimensions, the patterns by income show a positive quality-income gradient, but quality for other dimensions is higher at the low end of the income ladder and lower at the high end.

In part, the reversal of the pattern at the low end of the income scale can be attributed to the higher quality on such structural dimensions as teacher education found in publicly funded programs (e.g., California Title 5 programs, public prekindergarten programs, and Head Start), which largely serve children in low-income families. At the same time, higher quality for lower-income children on these structural dimensions does not necessarily translate into higher quality for these groups of children on the process dimensions. This is because structural characteristics, such as teacher education, are strong but not definitive predictors of process quality as measured in the ECERS-R and the CLASS.

The combination of low utilization of center-based ECE for the groups of preschool-age children with the largest readiness and achievement gaps and low rates of programs meeting quality benchmarks among those in center-based settings means that the children who could potentially benefit the most from high-quality preschool programs have very low rates of participation in such programs. As shown in Figure 2.6, based on the structural quality measures (i.e., group size, the child-staff ratio, or the education level of the lead teacher), anywhere from 20 to 50 percent of preschool-age children in the groups with the largest school-readiness and achievement deficits are currently participating in center-based ECE programs that meet quality benchmarks. If, instead, we rely on the process measures of quality, at best, 10 to 15 percent of preschool-age children in the groups that could potentially benefit the most are in higher-quality center-based ECE programs. These low rates of participation in programs with features associated with improvements in school readiness and academic achievement represent a missed opportunity to promote the cognitive and social development of more-disadvantaged children through effective preschool programs.

Figure 2.6

Preschool-Age Children in California with Largest Achievement and School-Readiness Gaps in High-Quality, Center-Based ECE Programs



SOURCE: Karoly, Ghosh-Dastidar, et al. (2008a, Figure S.6), based on RAND California Preschool Study household survey data, provider survey data, and provider observation data.

NOTE: Sample is all children. Sample size is 2,025. *Low maternal education* is defined as high-school graduate or less. Economically disadvantaged students are those whose parents did not graduate from high school or who are eligible for the NSLP.

Publicly Funded ECE Programs in California Are Not Designed to Achieve Maximum Child Development Benefits

Like other states, California uses an array of federal, state, and local funds to provide subsidized child-care and early-learning services to children one or two years before they enter kindergarten. Based on program information provided by state program administrators, as well as administrative data and interviews with officials implementing programs in several California counties, we were able to assemble the pieces to provide a better understanding of the publicly subsidized ECE system serving preschool-age children as a whole (Karoly, Reardon, and Cho, 2007a). The picture that emerged was of a complex system that is underfunded and not designed to promote or reward the provision of high-quality early-learning opportunities to the disadvantaged children it is designed to serve.

The System Is Complex, with Dual Motivations

At the time of the study, we focused on the 11 distinct programs funded with federal, state, and local monies, as listed in Table 2.4. As noted in Chapter One, when AB 2759 takes effect in July 2009, the first three state Title 5 child development programs listed in Table 2.4 (California State Preschool program, General CCD, and PKFL) will be consolidated into a single program, thereby simplifying the system to some extent (see Figure 1.1 in Chapter One). The current system and the more streamlined system target at-risk children, although eligibility varies across programs and program groups (see Karoly, Reardon, and Cho, 2007a, for more detail). By our estimate, in state FY 2005–2006, about \$1.9 billion in public funding was used to subsidize the part- and full-time care of about 260,000 preschool-age children through these programs.¹²

¹² The estimate of \$1.9 billion does not fully capture all local dollars added to the subsidized ECE system serving preschool-age children. Moreover, funds for most programs are not tracked by child age, so the figure is our best approximation.

Table 2.4
Publicly Funded ECE Programs in California Covered in Study

Program	Provider Types Subsidized	Licensing/Regulatory Mechanism
Federal programs		
Title I	Licensed centers, licensed family child-care homes	Title 22/Head Start Performance Standards
Head Start		
State Title 5 child development programs		
California State Preschool program (part and full day) ^a	Licensed centers, licensed family child-care homes ^b	Title 22/Title 5
General CCD ^a		
PKFL (part and full day) ^a		
Migrant CCD		
Cal-SAFE		
State and local preschool expansion programs		
PoP demonstration projects	Licensed centers, licensed family child-care homes	Title 22/Title 5, and local First 5
CalWORKs and non-CalWORKs AP programs		
CalWORKs stages 1, 2, and 3	Licensed centers, licensed family child-care homes, license-exempt, home-based providers	Title 22
Cal-Learn		
AP programs (non-CalWORKs)		

SOURCE: Karoly, Reardon, and Cho (2007a, Table 2.1).

^a Program will be consolidated into the California State Preschool program as of July 2009 under AB 2759.

^b The California State Preschool, PKFL, and Migrant CCD programs generally do not use licensed family child-care homes.

As shown in Table 2.4, the system subsidizes ECE services provided by a mixture of public and private providers—licensed centers (school based or not), licensed family child-care homes, and license-

exempt, home-based providers.¹³ License-exempt care (which may include care provided in the child's own home) is subsidized only through the AP programs listed at the bottom of the table. In addition to variation in licensing requirements, the programs in Table 2.4 differ in terms of other regulations that govern program requirements. Generally, the Head Start Performance Standards that govern the federally funded programs and the Title 5 regulations that govern the state-funded child development programs and preschool expansion programs are more stringent in terms of requirements for group sizes, child-staff ratios, teacher qualifications, and other program services than the base licensing requirements under California's Title 22. Finally, the first three program categories are funded through grants or contracts to provide care for a given number of eligible children, whereas the AP programs are funded through direct payments to the licensed or license-exempt providers made through the state-contracted AP program intermediaries (e.g., a local resource and referral agency or county office of education).

The system in place today evolved with two different motivations for providing subsidized care. Some components of the system, such as Head Start, Title I, and the California State Preschool program, aim to provide developmentally appropriate care and early-learning opportunities for at-risk and economically disadvantaged children as a way to support healthy child development and to prepare children to succeed in kindergarten and beyond. As such, these *developmentally oriented programs* have the more stringent program requirements, but programs may only be part day and thus not able to meet working parents' need for full-day care. Other components of the system, such as the CalWORKs and non-CalWORKs AP programs, are designed primar-

¹³ Under California law (Title 22), an individual providing care in his or her own home to children from one unrelated family, possibly in addition to his or her own children, is not required to be licensed by the Community Care Licensing Division of CDSS. Otherwise, an individual providing care in his or her own home must be licensed under Title 22, either as a small (up to eight children) or large (up to 14 children) family child-care home. A provider offering care in a group setting outside a home environment must be licensed as a child-care center under Title 22. See Karoly, Reardon, and Cho (2007a) for additional detail, including some exemptions.

ily to support low-income working parents in their need for child care. These *child care–oriented programs* place a priority of making full-day care available to those who need it, with a more flexible reimbursement mechanism that provides parents with more choice in providers (including the use of license-exempt care). Some components of the system, such as Head Start and CDE-administered Title 5 programs that provide full-day care, share both motivations.

The System Is Not Designed to Promote or Reward Quality

This divergence in motivations means that the quality of the services children receive and the implications for child development are not always front and center. By our estimate, about one in five preschool-age children participating in a subsidized program receives care in a center- or home-based setting with minimal or no licensing requirements (i.e., only Title 22 licensing applies or the provider is license exempt). For the other four in five children in subsidized settings with the higher Title 5 or Head Start standards, many of the program requirements fall below nationally recognized benchmarks for quality programs. Although low standards do not necessarily equate to poor quality (since providers may exceed licensing or regulatory requirements), the inattention to quality represents a missed opportunity for preschool-age children where there is great potential to have a positive influence on their developmental trajectory through high-quality ECE arrangements with a child development focus.

Although we know that there are important features of care settings for preschool-age children that can promote strong development, the subsidized care system in California is not designed to reward quality in providers receiving subsidies. First, with the exception of the PoP demonstration projects being implemented in nine counties, providers that exceed minimum program standards do not receive higher rates of reimbursement. This is despite the fact that efforts to achieve benchmarks associated with higher-quality programs and related to such features as teacher qualification and professional development, group size, or child-staff ratios will usually entail higher program costs, whether for higher salaries to attract and retain a more qualified staff, resources for more staff development, or the added costs of lower ratios.

Second, the programs with a focus on child development (e.g., Head Start, Title I, state Title 5 programs) have the highest standards for such program features as group size, child-staff ratios, and staff qualifications. Yet, particularly for the CDE-administered Title 5 programs, the reimbursement rate is effectively fixed for all providers across the state, regardless of differences in the cost of providing care or the quality of the care provided. In contrast, the components of the subsidized ECE system with lower quality standards—namely, the CalWORKs and non-CalWORKs AP programs, which can subsidize license-exempt care, settings that are essentially unregulated—the reimbursement rates are tied to market rates that are allowed to vary across the state and providers are reimbursed at their nonsubsidized rates up to the market ceiling. In the 22 counties where nearly 80 of preschool-age children live, those market rates as of 2006 exceeded the standard reimbursement rate for CDE contract programs. This reimbursement structure provides an explicit disincentive for many providers to participate in the contract-based ECE system with higher standards and a child development focus.

The System Is Not Funded to Serve All Children Who Are Eligible

Finally, because most programs listed in Table 2.4 are not fully funded to serve all children who meet the eligibility requirements, the fraction of eligible children who can be served depends on funding levels. Although Head Start is available primarily to families with income below the federal poverty line, California Title 5 programs are open to children in families with income up to 75 percent of California SMI, adjusting for family size (equivalent to about 240 percent of the federal poverty line as of July 2006 for a family of four, or \$48,400). We estimated that just over half of preschool-age children in California would qualify for one or more federal- or state-funded ECE programs as of 2006, or about 285,000 children in each annual cohort.

However, current funding for programs with a child development focus, such as Head Start and the state Title 5 child development programs, is not sufficient to serve all children who would be income eligible. We estimated that, given the available funding as of October 2006, fewer than half of the three- and four-year-olds in California

who would be eligible for publicly funded programs designed to prepare them for elementary school (e.g., Head Start or California State Preschool program) could be served by those programs because of limited funding. Table 2.5 shows that the fraction of eligible children served is higher for four-year-olds than three-year-olds.

How many children are left unserved? In other state (publicly) funded preschool programs, such as New Jersey's geographically targeted preschool program and Oklahoma's universal preschool program, participation rates are as high as 80 percent.¹⁴ Assuming that 80 percent of those eligible in California would choose to participate, the current system serves 66 percent of eligible four-year-olds and

Table 2.5
Estimated Gap in Eligibility and Enrollment for Subsidized ECE Programs in California with a Child Development Focus, October 2006

Measure	Three-Year-Olds	Four-Year-Olds
Estimated number of children eligible for federal- or state-subsidized ECE programs	286,166	283,472
Estimated number of children enrolled in ECE programs with a child development focus ^a	72,766	149,673
Estimated gap between eligibility and enrollment		
Assuming 80% participation rate among those eligible	156,166	77,104
Assuming 100% participation rate among those eligible	213,399	133,799

SOURCE: Karoly, Reardon, and Cho (2007a, Table 3.5).

^a Programs are Head Start, Title I, or state Title 5 programs.

¹⁴ New Jersey's Abbott district preschool programs serve children in the state's 31 highest-poverty school districts (those where 40 percent of children or more qualify for free or reduced-price lunch) (Barnett, Hustedt, Hawkinson, et al., 2006). As of the 2005–2006 program year, 78 percent of three- and four-year-old children in eligible districts were enrolled in the part- or full-day program. As reported in Barnett, Hustedt, Friedman, et al. (2007), Oklahoma's state-funded preschool program combined with Head Start served 84 percent of four-year-olds in 2006–2007.

32 percent of eligible three-year-olds in child development–oriented programs. With this assumed participation rate, more than 150,000 additional three-year-olds and 75,000 four-year-olds could be served if full funding were available.

At the same time that programs are not fully funded, the structure of the enrollment, contracting, and reimbursement system for state Title 5 programs leads to unspent monies every year (see Karoly, Reardon, and Cho, 2007a, for additional detail). For state FY 2005–2006, estimates suggest that \$80 million to \$100 million in Title 5 child development monies were not spent in the year in which they were appropriated. Other inefficiencies in the system arise from the multiplicity of programs and the process of matching children to spaces and rationing the limited spaces available.

The end result is a system that devotes substantial resources each year to subsidize the care of preschool-age children but without closely tying those dollars to the quality or stability of the care that the children receive. From the perspective of child development, the dollars spent are not used in such a way as to have their greatest impact on children’s developmental trajectories—in other words, to achieve the types of benefits documented in the effective programs discussed earlier in this chapter.

Expanding Access to High-Quality Preschool for Disadvantaged Children Can Narrow the Achievement Gap

All of the evidence presented thus far—sizable achievement gaps in the early elementary grades; rigorous evidence of favorable effects of high-quality preschool on student achievement, especially for disadvantaged children; and low rates of current participation in high-quality preschool programs among those with the largest achievement deficits—suggests that raising preschool access or quality (or both) could help reduce achievement gaps in the early elementary grades. In this section, we estimate how much of the current achievement gaps might be narrowed under various policy scenarios. This exercise, modeled on one

conducted by Magnuson and Waldfogel (2005), requires a number of assumptions. Thus, before presenting the results, we first outline the approach and associated assumptions, along with several alternatives that we employ to assess how sensitive our results are to variation in those assumptions.

Analytic Approach and Assumptions

To begin, the exercise assumes provision of a one-year subsidized preschool program available to four-year-olds, either to all children or on a targeted basis. For this population, we focus on the potential for various preschool policy options to affect the gaps in student achievement as of second or third grade by race-ethnicity—specifically, the gap between Latinos and whites and between African Americans and whites. Although earlier in this chapter we presented achievement differences in terms of reaching proficiency in English-language arts or mathematics, this exercise requires that we consider achievement gaps in terms of effect sizes—in other words, the gap in standardized mean scale scores between racial-ethnic groups. For reference, Table 2.6 shows the standardized scores for Latinos, African Americans, and whites for 2007 second- and third-grade CST scores in English-language arts and mathematics. Results are shown in absolute terms and, for the first two groups, relative to whites. In effect, the gap in student achievement in second and third grades between Latinos and African Americans and their white counterparts amounts to about 0.6 to 0.7 standard deviations. The question is, then, how much of this gap could be narrowed by changes in preschool policy?

Preschool policy changes may center on raising participation rates, increasing quality, or both. And any of these changes may be either targeted to specific groups of students or made available to all children on a universal basis. In terms of participation rates, we assume an increase, either for targeted groups or for all children, to a maximum of 80 percent. As noted earlier, this is the participation rate achieved in New Jersey's geographically targeted preschool program, as well as in Oklahoma's universal preschool program.

Table 2.6
Absolute and Relative Achievement-Score Differences, by Race-Ethnicity: 2007 CST in Second- and Third-Grade English-Language Arts and Mathematics

Test	Absolute Standardized Mean Scale Score			Difference in Standardized Mean Scale Score	
	Latinos	African Americans	Whites	Latino Versus White	African American Versus White
Second grade					
English-language arts	-0.30	-0.22	0.40	-0.70	-0.61
Mathematics	-0.25	-0.36	0.36	-0.62	-0.72
Third grade					
English-language arts	-0.32	-0.23	0.44	-0.76	-0.67
Mathematics	-0.25	-0.38	0.33	-0.57	-0.71

SOURCE: Author’s analysis of 2007 CST data.

NOTE: Achievement scores are standardized within grade and subject to mean 0 and standard deviation of 1. Numbers may not add because of rounding.

To model targeted programs, we stratify the population of preschool-age students in the three racial-ethnic groups of interest into three categories based on family income:

- lowest income: those with income below poverty (i.e., the eligibility threshold for Head Start¹⁵)
- low income: those with income between poverty and the CDE income threshold for subsidized ECE eligibility (equivalent to 75 percent of SMI)
- higher income: those not eligible for subsidized ECE in California.

To evaluate each policy scenario, we need estimates of current participation rates in preschool programs overall and by quality as a measure of the starting point or baseline. Estimates of participation in center-based ECE programs by race-ethnicity and income groups for California four-year-olds are based on the data collected for this study and parental reports of ECE participation. Since quality differences across groups were modest, we assume, regardless of race-ethnicity or income level, that 20 percent of children in center-based ECE programs are in high-quality settings that can be expected to produce the types of results in terms of academic achievement gains, equal to what has been measured for the effective programs discussed earlier in the chapter. The remaining 80 percent of children in center-based programs are assumed to be in lower-quality settings that would require additional improvements to reach the high-quality level.

¹⁵ The reauthorization of Head Start in December 2007 allows Head Start programs to enroll up to 35 percent of children with family income between 100 and 130 percent of the poverty line, provided that the program can demonstrate that children of families that are below the poverty line are already being served. Since Head Start funding is not sufficient to enroll eligible children with family income below poverty, it is not clear how often programs will be able to justify, in practice, serving children from families with incomes above the poverty line. There is also the option in the California State Preschool program of enrolling children with income above the state eligibility threshold (75 percent of SMI), but again, since the program is not fully funded to serve all those who qualify, fewer than 2 percent of enrollments go to children from families with incomes that exceed the eligibility limit (Karoly, Reardon, and Cho, 2007a).

We also need to make an assumption about the magnitude of the effect size associated with moving a child from no preschool to either lower- or higher-quality preschool and from lower-quality preschool to higher-quality preschool. Our baseline estimate assumes a maximum effect size of 0.3, which is consistent with effects on student achievement by second and third grade for Perry Preschool and Chicago CPC reported in Table 2.2.¹⁶ However, this effect size is based on evaluations with control groups that largely did not participate in preschool compared with groups participating in high-quality preschool programs. In increasing participation, we might expect the effect size of 0.3 to be attenuated for those who move from no program to a lower-quality program. The effect size might also be attenuated for those moving from participating in a lower-quality program to a higher-quality program (if there is some benefit to being in a lower-quality program over being in no program). Since the effect size of 0.3 is based on programs that served highly disadvantaged children, we might also expect the effect to be attenuated when more-advantaged children are served.

With these considerations in mind, Table 2.7 shows the baseline assumptions and two alternatives with respect to effect sizes of preschool on student achievement in second or third grade. Under the baseline assumption of a maximum effect size of 0.3 for moving a child in the lowest income group from no preschool to high-quality preschool, the effect size is assumed to be attenuated by one-third for those moving from some preschool to high-quality preschool and by two-thirds for those moving from no preschool to lower-quality preschool.¹⁷

¹⁶ This effect size is also consistent with results from recent meta-analyses, such as those by Anderson et al. (2003); Nelson, Westhues, and MacLeod (2003); and Camilli et al. (2010). For example, based on a meta-analysis of 123 studies, Camilli et al. (2010) report an estimated effect size of preschool programs on cognitive outcomes of 0.47 immediately after treatment (i.e., ages three to five) and of 0.23 in the short term (i.e., ages five to ten).

¹⁷ There is relatively little empirical basis for selecting the magnitude of the attenuation factors for our analysis in the baseline or alternative scenarios, as most studies of preschool program effects do not consider different control-group conditions (e.g., a control group of no preschool versus a high-quality preschool or a control group of a low-quality preschool versus a high-quality preschool) or differences in program effects by economic status. Nevertheless, there is some evidence on which we can draw in making the assumptions shown in Table 2.7. For example, the higher effect sizes reported in Table 2.1 for the Tulsa, Oklahoma,

Table 2.7
Assumptions Regarding Effect Sizes from Increase in Preschool
Participation or Quality or Both

Assumption	Effect Size		
	Lowest Income	Low Income	High Income
Baseline			
No preschool to high-quality preschool	0.3	0.2	0.1
No preschool to lower-quality preschool	0.1	0.1	0.0
Lower-quality preschool to higher-quality preschool	0.2	0.2	0.1
Alternative I (baseline with less attenuation)			
No preschool to high-quality preschool	0.3	0.3	0.1
No preschool to lower-quality preschool	0.3	0.3	0.0
Lower-quality preschool to higher-quality preschool	0.3	0.3	0.1
Alternative II (baseline with 0.6 effect size)			
No preschool to high-quality preschool	0.6	0.4	0.2
No preschool to lower-quality preschool	0.2	0.2	0.0
Lower-quality preschool to higher-quality preschool	0.4	0.4	0.2

SOURCE: Author's assumptions.

program compared with the Head Start program may be attributable to the higher quality of the Oklahoma program (measured, for example, by teacher qualifications). The Oklahoma effect sizes are consistently about 2.5 times the magnitude of the Head Start effect sizes for the child development measures they have in common. In Table 2.7, the baseline assumption is that a high-quality preschool generates an achievement effect that is two to three times that of a low-quality preschool, compared with the alternative of no preschool. As another example, the Oklahoma evaluation provides a comparison of program effects by child economic status. As shown in Figure 2.2, the effect sizes for the lowest income group (those eligible for a free lunch) are about 1.2 to 1.6 times the effect sizes for those in the highest income group (those not eligible for a free or reduced-price lunch), depending on the child development measure. In Table 2.7, the baseline assumption is that the effect sizes are 1.5 to 3 times as large for the lower or lowest income group as they are for the highest income group. So, arguably, the baseline attenuation factors assumed in Table 2.7 may be considered conservative.

The baseline also assumes that the effect size is attenuated in moving from the lowest income tier to the highest. The first alternative scenario retains the maximum effect size of 0.3 but assumes no attenuation with the type of participation or quality change and no attenuation for the lowest two income tiers. Finally, the second alternative scenario applies the same attenuation pattern as the baseline but assumes that the maximum effect size is twice as big, i.e., 0.6. This effect size is consistent with the magnitude of the effects of preschool programs on school-readiness measures (see Table 2.1) and provides a gauge of the potential effects of the policy scenarios we consider on school-readiness gaps.¹⁸

With these assumptions, we consider the following policy scenarios:

- A. Raise participation in center-based ECE programs for all children to 80 percent with no change in quality.
- B. Raise quality for all children currently participating in center-based ECE programs to the high-quality tier with no change in participation rate.
- C. Raise participation to 80 percent for children in the lowest two income tiers only and increase quality for all participants.
- D. Raise participation to 80 percent for children in the lowest two income tiers only and increase quality only for the same groups.
- E. Raise participation to 80 percent for children in the lowest income tier only and increase quality only for the same group.
- F. Raise participation to 80 percent for all children and increase quality for all.

¹⁸ Magnuson and Waldfogel (2005) perform their analysis for school-readiness gaps, and 0.6 is in the range of effect sizes they consider. We do not have California-specific estimates for a statewide representative sample of the magnitude of existing school-readiness gaps by race-ethnicity comparable to what we report for achievement gaps in Table 2.6. However, we can expect that the school-readiness gaps are of similar magnitude to those observed for achievement gaps, given evidence from national data and data from other states (Magnuson and Waldfogel, 2005).

The first two scenarios are universal changes but for only one dimension: participation or quality, respectively. In the first scenario, in which only participation rates increase, the distribution of children by setting quality is assumed to remain unchanged. In other words, 20 percent of the new participants are assumed to be in the highest-quality settings, and the other 80 percent are assumed to be in the lower quality tier. The third through fifth scenarios combine targeted participation increases either with universal quality improvements or with only targeted quality improvements. Scenarios D and E differ in that E targets participation and quality changes only for the lowest income tier, those children in families with incomes below the poverty line, whereas D also includes the next income tier in the targeted changes. Finally, the last scenario assumes increases in participation and quality for all.

Effects of Alternative Policy Scenarios on Achievement Levels and Gaps

With these assumptions, Table 2.8 shows the effects on student achievement for Latinos, African Americans, and whites of the different policy scenarios under the three effect-size assumptions (baseline, alternative I, and alternative II). The first three columns of table results show the estimated absolute change in the standardized score for each racial-ethnic group, which can be interpreted as an effect size (i.e., standard deviation units). The next two columns express the absolute change for Latinos and African Americans as a percentage of the current score gap with whites in English-language arts in the third grade (see Table 2.6).¹⁹ This percentage effect can be interpreted as the fraction of the minority-white score gap that would be closed if white students made no gains as a result of the policy changes. This would be the case if, for example, the policy change could be targeted not only by income tier but also by race-ethnicity. Finally, since white students

¹⁹ Results would be similar if we used the second-grade English-language arts score gap. The mathematics score gap is smaller than the English-language arts gap for Latinos, so the percentage effects we report would be somewhat smaller if we used the mathematics score gap as the basis for the comparison. The reverse would be true for African Americans, at least for second-grade mathematics.

Table 2.8
Effect of Preschool Policy Changes on Racial-Ethnic Achievement Gaps, Under Alternative Assumptions

Policy- Change Scenario	Change		Absolute Standardized Score Change (standard deviation units)			Score Change (percentage of third-grade English- language arts score gap with whites)			
						Absolute		Relative to Whites	
	Participation	Quality	Latinos	African Americans	Whites	Latinos	African Americans	Latinos	African Americans
Baseline									
A	Universal	No change	0.02	0.01	0.01	2.0	1.0	1.4	0.2
B	No change	Universal	0.09	0.11	0.08	12.0	16.5	1.8	5.0
C	Targeted	Universal	0.12	0.12	0.09	15.9	18.0	4.6	5.2
D	Targeted	Targeted	0.11	0.11	0.05	14.3	16.5	8.0	9.4
E	Very targeted	Very targeted	0.07	0.06	0.02	8.8	9.5	5.9	6.3
F	Universal	Universal	0.13	0.12	0.09	16.5	18.3	4.6	4.9
Alternative I (baseline with less attenuation)									
A	Universal	No change	0.03	0.02	0.01	4.4	2.4	3.0	0.9
B	No change	Universal	0.13	0.16	0.10	17.1	23.8	4.4	9.5
C	Targeted	Universal	0.16	0.18	0.11	21.4	26.2	7.4	10.4
D	Targeted	Targeted	0.15	0.17	0.07	19.7	24.7	10.8	14.6

Table 2.8—Continued

Policy- Change Scenario	Change		Absolute Standardized Score Change (standard deviation units)			Score Change (percentage of third-grade English- language arts score gap with whites)			
						Absolute		Relative to Whites	
	Participation	Quality	Latinos	African Americans	Whites	Latinos	African Americans	Latinos	African Americans
E	Very targeted	Very targeted	0.09	0.10	0.03	11.5	14.2	7.7	10.0
F	Universal	Universal	0.17	0.18	0.11	22.0	26.5	7.5	10.1
Alternative II (baseline with 0.6 effect size)									
A	Universal	No change	0.03	0.01	0.01	4.1	2.0	2.7	0.5
B	No change	Universal	0.18	0.22	0.15	24.0	32.9	3.6	10.0
C	Targeted	Universal	0.24	0.24	0.17	31.8	36.1	9.2	10.5
D	Targeted	Targeted	0.22	0.22	0.10	28.6	33.0	16.0	18.8
E	Very targeted	Very targeted	0.13	0.13	0.04	17.5	19.1	11.8	12.6
F	Universal	Universal	0.25	0.25	0.18	33.1	36.7	9.3	9.8

SOURCE: Author's analysis of 2007 CST data and RAND California Preschool Study household survey data.

will also gain from the universal or targeted policy changes (although by smaller amounts, because their participation rates in high-quality programs are higher to start), the last two columns account for the relative test-score gains of Latinos and African Americans compared to whites and express the relative score change as a percentage of the current score gap in third-grade English-language arts.

To illustrate the interpretation of the results in Table 2.8, consider the baseline results under policy scenario A, in which participation is increased for all racial-ethnic and income groups to 80 percent with no change in quality. The estimates indicate a gain of 0.02 standard deviation units in Latino test scores and half again as much for African Americans and whites. This small effect reflects the fact that 80 percent of the increase in participation will be in lower-quality programs (consistent with the current quality distribution), for which we have assumed an effect size of 0.1. These absolute changes for Latinos and African Americans are just 2 percent and 1 percent, respectively, of the existing score gap (approximately 0.7 standard deviation units). Given the small gains that accrue to white students, the difference in the score change for Latinos and African Americans compared with whites is an even smaller percentage of the current score gap. These effects are somewhat larger when we assume less attenuation in the preschool effect size (alternative I). They are doubled, but still small, when we assume an effect size that is twice as large (alternative II).

In reviewing the results in Table 2.8, it is important to keep in mind that this is an analytical exercise that is intended to convey the potential magnitude of the effect of preschool policy changes on racial-ethnic achievement-score gaps in the early elementary grades. Although the estimated effect on the score gap is of interest in itself, it is also of interest to see how the effect on score gaps varies with different strategies in terms of targeted versus universal policies. The inferences drawn from this analytic exercise, based on the baseline assumptions, can be summarized as follows:

- Increasing participation in preschool programs with no change in quality has almost no effect on achievement-score gaps (scenario A).

- The largest absolute score gains for Latinos and African Americans—approximately 17 to 18 percent of existing score gaps—arise when the increases in participation and quality are universal (scenario F). This is because we assume that even higher-income children in the minority racial-ethnic groups benefit from the increase in quality, whereas lower-income children benefit from both the increase in participation and quality.
- The effects on absolute score gains are almost as large when the changes in participation are targeted but quality is improved for all children (scenario C). That is because the participation rates are already close to or equal to 80 percent for the highest income tier.
- Since white children also benefit from universal increases in participation or quality or both under scenarios C and F, the largest change in Latino and African American achievement scores relative to the change in scores for white children—about 8 to 9 percent of existing score gaps—occur under scenario D, in which the participation and quality gains are targeted to the two lowest income tiers (i.e., income below 75 percent of SMI). This is because the targeted policy benefits white children to a lesser degree, as fewer white children are in the targeted groups.
- The percentage of the score gap that is changed, accounting for the gains to whites, is smaller when the policy change targets only the lowest income group (i.e., those with income below poverty) under scenario E than when it targets the broader group in scenario D. This is because the very targeted policy does not capture the potential gains, albeit gains that are assumed to be smaller, from raising participation and quality for children in the middle income group. Since Latinos and African Americans are over-represented in this group relative to whites, there are still relative score gains associated with including the middle income group in the targeted population.

These results derive from baseline assumptions of a maximum effect size of high-quality preschool of 0.3 and of an effect size that is attenuated when (1) participation changes do not lead to high qual-

ity, (2) children are already in preschool and experience only a quality increase, and (3) the changes in preschool participation or quality accrue to more economically advantaged children (i.e., higher income groups). Relaxing these assumptions to some extent under alternative I indicates that the largest absolute gains relative to the achievement gap with whites under scenario F could reach 22 percent for Latinos and 27 percent for African Americans, and the largest relative score gains as a share of the achievement gap under scenario D could reach 11 and 15 percent, respectively, for the two groups.

Since alternative II assumes an effect size that is double that of the baseline, all the absolute and percentage changes are twice as large as those calculated under the baseline. As noted earlier, an effect size of 0.6 is more reasonably what would be expected in terms of gains on school-readiness measures from participation in high-quality preschool. Although we do not have estimates for statewide representative samples of the magnitude of the readiness score gaps by race-ethnicity, they are likely to be as large as those measured by third grade. Thus, the largest absolute and relative percentage changes under alternative II—a range from 33 to 37 percent in absolute terms for scenario F and 16 to 19 percent in relative terms under scenario D—are likely to capture the expected magnitudes of the effects of the associated preschool policy changes on school-readiness gaps.²⁰

²⁰ These results are in line with those reported by Magnuson and Waldfogel (2005), who perform a similar analysis, although one that employs a somewhat different set of assumptions and policy scenarios. The Magnuson and Waldfogel estimates are intended to apply nationally and to focus on narrowing school-readiness gaps. Hence, they use base effect sizes of 0.15, 0.25, and 0.65, associated solely with increasing preschool participation. Using the intermediate assumption of 0.25, they also consider the effect of quality enhancements and assume that they would add another 0.1, 0.2, or 0.3 to the effect size. They also consider somewhat different policy scenarios, including targeted increases to 100-percent preschool participation by African Americans and Hispanics. Consequently, the magnitude of the estimated effects of expanding preschool participation or raising quality on the readiness gap are larger in their findings for comparable policy changes than what we report under the baseline in Table 2.8 but closer to those under alternative II, for which we assume a larger effect size. Despite these differences, they also conclude that the largest reduction in the African American–white and Hispanic–white readiness gaps would occur with a combination of preschool expansion and quality enhancements that target the two minority groups (with no change

Summary

The body of research we have summarized in this chapter identifies shortcomings in both adequacy and efficiency in preschool education in California. In terms of adequacy, we find the following:

- California has sizable achievement gaps in academic performance by second and third grades, with large deficits in performance for ELLs, Latinos and African Americans, children whose parents have low income, and children from economically disadvantaged families. These gaps are not just a product of the K–12 education system but are mirrored in readiness gaps for the same groups of children when they first enter school. Thus, not all children in California enter school with the skills needed to succeed against the state’s rigorous education content standards. Some children who start out behind will catch up sooner or later, but far too many will start out behind and stay behind.
- California’s current system of publicly and privately funded ECE for preschool-age children is characterized by sharp differences in participation rates and mixed success in providing program features associated with quality. The children with the largest readiness and achievement gaps have the lowest rates of participation in high-quality preschool. In effect, there is a mismatch between who would benefit most from effective preschool and who actually participates.
- To the extent that more-disadvantaged children participate in preschool, many do so in a publicly subsidized program. Yet, the system of publicly funded ECE programs in California does not have sufficient funding to enroll every child who qualifies or whose family would choose to enroll him or her.

on the participation or quality for whites), as compared with a universal expansion of use and quality for all three racial-ethnic groups.

In terms of efficiency, we find the following:

- The minimal regulation of some subsidized providers, coupled with relatively weak standards in some domains for the child development–oriented programs, means that there is no guarantee of quality in subsidized programs serving preschool-age children. Furthermore, there is no financial incentive for providers that want to boost quality to do so. This represents a missed opportunity to ensure the maximum child development benefits from the dollars that are spent on subsidized programs.
- The mechanisms for allocating public funds to providers, both through contracts and vouchers, do not ensure that all funds allocated are spent in any given year. Thus, fewer children are served than what the funding would otherwise allow.
- The complexity of the current system of subsidized ECE programs makes it costly for providers to administer, challenging for families to navigate, and difficult for policymakers and the public to understand, evaluate, and improve.

High-quality preschool, especially for disadvantaged children, has been demonstrated to promote school readiness and raise student achievement above the levels that those children otherwise would have obtained. In the next two chapters, we discuss policy options and recommendations for California to address the current shortfalls in preschool adequacy and efficiency. In doing so, it is important to keep in mind that, although preschool can be part of the solution for narrowing readiness gaps and subsequent achievement gaps, our analysis indicates that expanding preschool access and quality, even on a targeted basis, cannot be expected to eliminate existing gaps. Thus, preschool must be part of an integrated set of strategies, potentially from birth to high-school graduation, to help children succeed in school.

Design Options for State Preschool Systems

The past decade has been an active period for policy change in preschool systems at the state level. Some states have started from a base of no state funding for preschool programs and have built a reasonably rational system from the ground up, starting with first principles. Others have modified or added to an existing system that may have been created decades earlier. Those existing systems, at any given time, were the product of prior reforms that often were expedient or reasonable in the context of the system that had evolved up to that time but that may no longer meet the state's needs. In many respects, California is in the position of having a system that has evolved and now exhibits shortfalls in both adequacy and efficiency.

Before considering policy recommendations, it is useful to start from first principles and discuss the merits of alternative approaches to designing a publicly funded preschool system. To organize our discussion of preschool design options, we have conceptualized preschool systems into four key domains:¹

- *access*: Which children are eligible for publicly funded preschool?
- *delivery*: What entities provide the preschool services supported with public funds?
- *quality*: What ensures that programs achieve high quality?
- *infrastructure*: How is the preschool system structured to promote efficiency?

¹ Other researchers have conceptualized preschool or ECE systems in other ways. For example, see Kagan (2007).

For each of these domains, starting from first principles, we discuss the advantages and disadvantages of alternative approaches and any research-based evidence for or against the various options. This discussion then forms the basis for the recommendations for improving the adequacy and efficiency of California's preschool system, presented in the next chapter.

Access: Universal Versus Targeted Preschool Programs for One or Two Years

Which children are eligible for a publicly subsidized preschool program is a central element of program design. Two basic approaches to preschool access are evident across the states: programs universally available to all children in a particular age range on a voluntary basis and targeted programs that are available only to children who meet specific criteria. In terms of the eligible age range, programs may be designed to serve children in the year before kindergarten entry (the four-year-olds) or up to two years before kindergarten entry (the three-year-olds). In the case of targeted programs, the two main approaches to defining eligibility are based on the characteristics of the child (e.g., at risk of abuse or neglect) or child's family (e.g., low income) or based on living within a specific geographic boundary (e.g., a school district or school catchment area).

Universal Versus Targeted

In designing a preschool system, policymakers and the public need to consider the trade-offs involved in targeted versus universal programs. Table 3.1 summarizes a set of criteria that can be considered when assessing the merits of making a given high-quality preschool program available only to a targeted population versus making it available to all children (see also Wolfe and Scrivner, 2003, and Barnett, Brown, and Shore, 2004). The first two criteria in Table 3.1—cost and displacement—may favor a targeted program. In terms of total cost, a targeted program would generally be less costly than making the same program available to all children, simply because of the smaller number

Table 3.1
Potential Trade-Offs Between Targeted and Universal Preschool Programs

Criteria	Targeted Program	Universal Program
Total cost	Lower	Higher
Displacement of private spending	Smaller	If fully subsidized, will displace private spending on similar programs
Economic returns	Higher per child	Lower per child, but aggregate net benefits may be higher
Administrative costs associated with determining which children are eligible	Yes	No
Ability to target	Children move in and out of eligibility because of changing family circumstances Eligibility rules often exclude children who can benefit	Children remain eligible regardless of changing circumstances All children who can benefit are eligible
Participation rates	Not all eligible children enroll because of confusion over eligibility rules or stigma	Participation may be higher and with greater integration within programs or classrooms
Funding	Programs often not fully funded or not funded at level required for high quality	Public or political support for fully funded high-quality programs may be higher

SOURCE: Author's analysis.

of children served. In addition, to the extent that more-advantaged children already participate in ECE programs, such as preschool programs paid for by their families or other private sources (e.g., employers), a publicly funded, universal program could displace or “crowd out” some or all of those private funds. Such crowding out is likely to be smaller with a program targeted at disadvantaged children, who would be less likely to otherwise participate in programs that are not subsidized.

The third criterion—economic returns—is one that may favor either approach. On the one hand, the evidence of favorable economic returns to high-quality preschool programs comes primarily from programs that serve more-disadvantaged children. For example, estimates indicate that the Chicago CPC program generates about \$7 in benefits for every dollar spent, whereas estimated returns to the Perry Preschool program are even higher (from \$5 to \$17 per dollar spent, depending on the length of the follow-up period and which benefits are included) (Karoly, Kilburn, and Cannon, 2005). In the absence of long-term evaluations of universal ECE programs, several studies have projected the potential costs and benefits of universal preschool programs in specific states. These studies generally find that the economic returns from universal programs are lower on a per-child basis than those from targeted programs and that the benefit-cost ratios are lower as well. For example, based on the estimated effects of the Chicago CPC program on various child outcomes, Karoly and Bigelow (2005) estimated that, for every dollar invested in a high-quality, voluntary, universal preschool program in California—assuming that 70 percent of four-year-olds participate—California society would gain between \$2 and \$4 of benefits.² The estimated returns per dollar invested for a universal program are lower than those associated with the targeted Chicago CPC program because Karoly and Bigelow assumed that benefits would be attenuated as more-advantaged children were served. More-advantaged children may generate lower benefits because there is less room for a preschool program to improve their outcomes and many already participate in preschool programs even without a public subsidy.

On the other hand, universal programs may generate aggregate net benefits (the sum of net benefits per child across all children served) that exceed those from targeted programs.³ Indeed, Karoly and Bigelow's (2005) estimates imply that a universal program in California

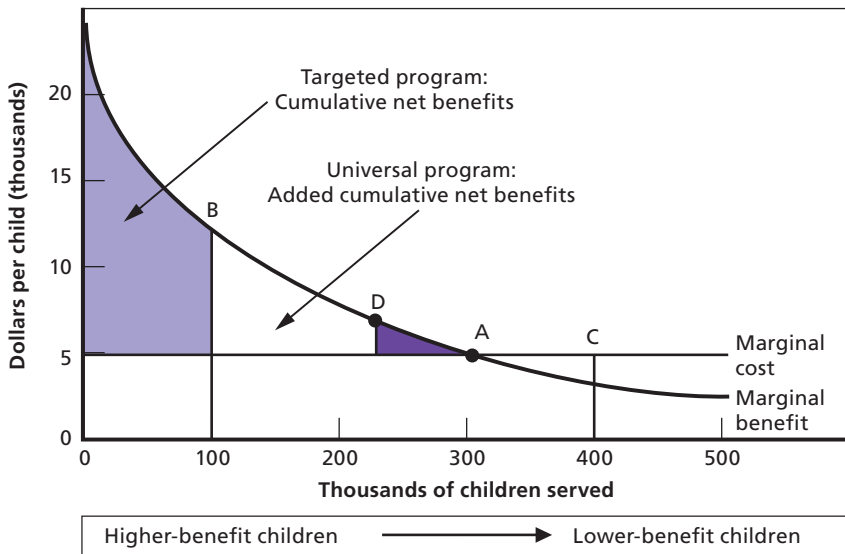
² Belfield (2005) estimated somewhat lower returns for universal programs in Massachusetts, Ohio, and Wisconsin, although private benefits (i.e., to program participants) are not included in the analysis, whereas such benefits are included in the study by Karoly and Bigelow (2005).

³ See also Barnett (2005) on this point.

would generate net benefits of \$493,000 for every 100 children in the state, whereas a targeted program serving the most disadvantaged 25 percent of the population would generate \$377,000 in net benefits for every 100 children.

Figure 3.1 provides a visual explanation for this result. As shown in the figure, the preschool program is assumed to cost \$5,000 per child no matter how many children are served.⁴ The shape of the marginal benefit curve assumes, however, that the benefit per child declines in moving from serving higher-benefit (i.e., more-disadvantaged) children to lower-benefit (i.e., less disadvantaged)

Figure 3.1
Costs and Benefits of Targeted Versus Universal Preschool Programs



RAND MG889-3.1

⁴ For any given number of children served along the x-axis, the total cost is the area under the horizontal marginal cost curve up to that number of children.

children.⁵ Up to point A, the benefit per child remains above cost per child and the net benefit is measured as the positive distance between the benefit and cost curves. After point A, each additional child served generates negative net benefits, as the marginal cost curve lies above the marginal benefit curve. Consider first a targeted program that serves the most disadvantaged 100,000 children. Point B shows the marginal benefit for the last child served, and the sum of all net benefits is the lighter shaded area between the benefit and cost curves up to point B. Now consider a universal program with an 80-percent participation rate that serves 400,000 out of 500,000 children. At point C, the area between A and C and the two curves is an area of negative net benefits that must be subtracted from the area of positive net benefits up to point A. The negative area is reflected backward in the darker shaded area between A and D. Even with the negative portion of benefits, the universal program still generates more total net benefits (the lighter shaded area plus the white area between points B and D and between the two curves) compared with the targeted program. Based on the analysis in Karoly and Bigelow (2005), California is most likely at a point like B, where further expansion of the state's current targeted set of ECE programs toward—and even as far as—universal access would generate greater total net benefits to society compared with the status quo.

The last four criteria in Table 3.1—administrative costs, targeting efficiency, participation, and funding—may favor a universal program. A targeted program requires establishing eligibility rules and an administrative structure to determine whether a child meets the eligibility criteria. These administrative costs can be avoided when a program is available to all children regardless of circumstances, although other costs of administering a universal program may prevent administrative costs from reaching zero. When a program is targeted, it is often a challenge to ensure that the targeted population is served. Children's

⁵ The discussion proceeds initially in terms of cost and benefit per child or per child on the margin. The figure also illustrates, along the x-axis, total costs or total benefits for any given number of children served. For example, at 100,000 children served, the total cost is the area under the horizontal marginal cost curve, while the total benefit is the area under the marginal benefit curve.

circumstances often change, so they may move in and out of eligibility over time. For example, a program originally serving children whose families have income below poverty as of the time of enrollment may be serving a mixture of poor and nonpoor children by the time the program ends. Meanwhile, other children who were initially not poor, and therefore ineligible, have become poor over time but are not in the program. Moreover, observed criteria may often be an inadequate mechanism for identifying children who will benefit the most from a given program. A child whose family's income is just above the poverty line is likely to benefit just as much as one whose family's income is just below the poverty line.⁶ With a universal program, children remain eligible regardless of changes in their circumstances, and all children can reap the benefits from participating in the program, regardless of whether the benefit is large or small. Another challenge for a targeted program is ensuring full participation by the targeted population. Children may not enroll when there is confusion over eligibility rules or when a program is stigmatized as serving only disadvantaged children. Not only may a universal program achieve higher participation rates, even among the targeted population, but children may be more likely to participate in programs that are economically integrated.⁷ Finally, as is the case with Head Start, a targeted program (especially one targeted at a more disadvantaged population) may be less likely to be fully funded or funded at the level required to deliver high-quality services because there is not a large enough or sufficiently powerful constituency to ensure that level of public or political support. In con-

⁶ Although many school achievement problems, such as grade repetition, special-education use, and dropping out, may be less prevalent for more advantaged children, they are still significant, even among middle-class children. At least one-half of all special-education students, students retained in grade, and students who do not complete high school are children whose family incomes fall between the 20th and 80th percentiles of the income distribution (Karoly and Bigelow, 2005).

⁷ There is some evidence from a study of Georgia's universal preschool program that a child's developmental outcomes in preschool are positively associated with the skill level of his or her classroom peers (Henry and Rickman, 2007). Although the study is not definitive, it suggests that there may be benefits for disadvantaged children of being in classroom with more-advantaged peers.

trast, there may be greater political and public support for funding a high-quality program that serves all children.

With targeted programs, there are alternative approaches to targeting that may mitigate some of the potential disadvantages of a targeted system. In particular, when targeting is based on where children and their families live (i.e., place-based eligibility) rather than their personal characteristics (i.e., person-based eligibility), the administrative costs are lowered, as families need only document where they reside (just as they typically do when their child enters the public school system) rather than documenting family income, work status, and so on. It may be possible to generate higher participation rates in geographically targeted programs because program information can be easier to disseminate and stigma may be reduced. Eligibility may change if a family moves, so there may still be volatility in eligibility that does not reflect changes in the ability to benefit from the program. Such geographic targeting, however, may reduce the ability to reach a target population that is based on other characteristics, such as family income or low levels of parental education. Thus, some children who may be in the target group will not be living in geographic areas that are targeted, and some children in the targeted geographic areas would otherwise not be eligible under a system that targets child or family characteristics, such as family income. We return to this issue when discussing policy options for California.

Finally, it is worth noting that universal programs do not necessarily have to be uniform. Instead, program features, the mix of services, or the intensity of program services may be varied within a larger program model to meet the specialized needs of children and families in a given community. So, for example, under a universal preschool system, preschool programs in more-disadvantaged communities may offer additional services that would not be made available in more affluent communities. In addition, although universal access may be an eventual goal, funding or capacity constraints may require that a program expand gradually in order to ensure high quality. Given the likelihood of differential returns for more and less disadvantaged children, as shown in Figure 3.1, the returns to public spending can be maximized by first serving disadvantaged children or communities

with a greater prevalence of at-risk children, before expanding coverage to the broader population.

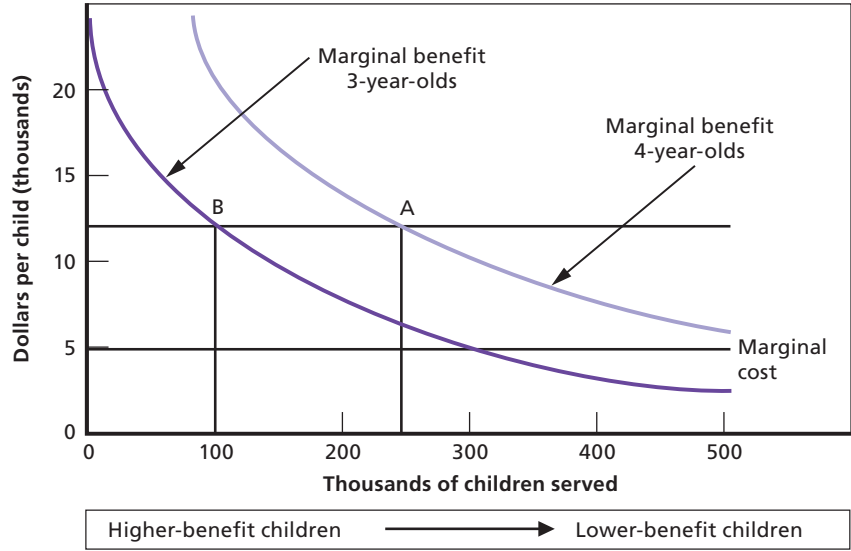
One Year or Two

A second consideration for preschool policy design in the context of who participates is whether subsidized programs should serve only four-year-olds or both three- and four-year-olds. As noted in Chapter One, states that have implemented universal programs to date do so only for four-year-olds, although Illinois has committed to universal access for both three- and four-year-olds. From the standpoint of program costs, two years of preschool services incur twice the costs of a one-year program. Thus, a key policy question is whether a second year of preschool generates sufficient incremental benefits compared with participation for one year to justify the additional costs.

Unfortunately, this is not an issue that has been rigorously studied, although there is some suggestive evidence that there is additional positive benefit from a second year of preschool but that it is incrementally smaller than the gain from participating for one year. First, it is worth noting that the evidence of favorable effects from effective preschool programs (reviewed in Karoly, Reardon, and Cho, 2007b, and summarized in Chapter Two) comes from programs that provide services for one year (the various state preschool programs listed in Table 2.1), as well as those that provide two years (e.g., Chicago CPC, Head Start, and Perry Preschool). Second, because the second group of programs served some children for only one year and others for two, there is some insight that can be gained by comparing outcomes for the two types of participants in these programs. For example, in the Chicago CPC evaluation, Reynolds (1995) reports that the magnitude of the effects on such outcomes as achievement scores were consistently higher for two-year participants than for one-year participants but that the marginal advantage of the second year was much smaller than that of the first. The Perry Preschool evaluation produced similar findings, although the sample size for the one-year program group is quite small, so it limits the statistical power for testing differences between the two program groups (Barnett and Escobar, 1987; Schweinhart and Weikart, 1988; Schweinhart, 2005).

If the pattern of marginal benefits for four-year-olds and three-year-olds follows the pattern shown in Figure 3.1 and if the marginal benefit curve for three-year-olds lies to the left of that for four-year-olds as illustrated in Figure 3.2, then an efficient allocation of a given budget would equate the marginal net benefit from serving the two groups of children. As shown in Figure 3.2, if the budget will fund preschool for 300,000 children, then total net benefits are maximized when the marginal net benefits are equalized at points A and B. At this optimum level, 100,000 three-year-olds and 250,000 four-year-olds are served.⁸

Figure 3.2
Costs and Benefits of Preschool Programs Serving Three- and Four-Year-Olds



RAND MG889-3.2

⁸ Total net benefits are maximized at this solution, for a given budget, because moving to the right of point A to serve more four-year-olds would add children on the margin with lower net benefit (moving down the four-year-old marginal benefit curve) compared with the three-year-olds at the margin (moving up the three-year-old marginal benefit curve to the left of point B) who would not be served given the fixed budget. For additional discussion of this resource-allocation rule, see Kilburn and Karoly (2008).

In other words, if the goal is to maximize the return to investments in preschool programs and if resources are constrained, a sequential strategy as resources expand would entail serving the most-disadvantaged four-year-olds first. Then, as more resources become available, additional four-year-olds could be served and three-year-olds could be added until the point at which the marginal net benefits are equalized across the two age groups. If the marginal benefits of serving a four-year-old are always higher than those of serving a three-year-old at the same point in the risk continuum, this approach would mean serving more four-year-olds than three-year-olds. Eventually, as more resources become available, the system may serve all four-year-olds and a targeted group of three-year-olds. In practice, we do not know with precision the shape of the marginal benefit curve in Figure 3.2 for either age group, so we cannot make the resource-allocation decision with complete information at hand. Nevertheless, the argument, in principle, stands and can be used to guide decisionmaking.

Another point of consideration is that, if three-year-olds are eligible for subsidized preschool, they should be ensured of eligibility for two years, ideally in the same program if the family would choose to stay. Provided that a program is high quality, a child stands to experience greater gains from program participation when there is stability and continuity in the program services.

Finally, in addition to determining preschool program duration, a related design issue is the intensity of the program in any given year—for example, whether a program is part day or full day or even whether it operates for an academic year or the full calendar year. Although there are some exceptions, most of the evidence summarized in Chapter Two regarding preschool program benefits comes from evaluating part-day, academic-year programs (see Cannon and Karoly, 2007b, for more detail). And it is relatively rare to have experimental evidence that allows comparisons of the effects on child development of variation in program intensity. One exception is an evaluation of New Jersey's targeted Abbott preschool program, in which participating children in one school district are randomly assigned to an eight-hour program operating for 45 weeks versus the usual 2.5- to 3-hour program operating for 41 weeks (Robin, Frede, and Barnett, 2006). The evaluation

showed that the children in the extended program had higher gains in vocabulary and math skills than did the children in the less intensive program, gains that were also evident a year later, at the end of first grade.⁹ Since full-day or year-round programs also support working parents and their need for more hours of care, this research suggests that preschool programs that provide more-intensive services may not only benefit parents but also promote additional gains in child development, especially for more-disadvantaged children.

Determining Eligibility in Targeted Programs and with Prioritization

In a targeted preschool system, it is necessary to determine eligibility, which may be based on location or other child and family characteristics, depending on the eligibility rules. Moreover, when there are insufficient funds to serve all eligible children, a system of rationing or prioritization is implicitly incorporated into the eligibility determination process (i.e., what determines which eligible children whose families want them to participate actually get to enroll). If the goal is to maximize the returns from using public dollars to support the early education of preschool-age children, then principles of the eligibility determination process would include the following:

- Among those eligible, serve the children who would benefit the most first before serving those who would benefit less (e.g., those further on the left hand side of the x-axis in Figure 3.1).
- Promote stability in program placement, both during the preschool years and in the transition from preschool to public kindergarten.
- Design a process that is easy for parents to understand and for providers and other intermediaries to administer.

⁹ The children in the extended preschool program also had a somewhat more intensive kindergarten program (eight hours per day for 45 weeks versus six hours per day for 41 weeks). Thus, some of the advantage for the extended-program group at the end of kindergarten and first grade may be attributable to the more intensive kindergarten program, although the difference in hours in the kindergarten year was not as large as the difference in the preschool year.

In practice, the first principle means serving economically disadvantaged children first (for example, those with income below poverty) before those who have incomes closer to 75 percent of SMI. Assuming that children are participating in high-quality programs, providing stable placements according to the second principle will allow children to gain the maximum benefits over time from sustained participation in a given program.¹⁰ Stability during the preschool years would mean determining eligibility at the time of enrollment and then retaining eligibility for an entire program year. It could also mean giving priority placement to four-year-olds who want to remain in the same program they attended when they were age three. Likewise, for children participating in public school–based preschool programs or programs under contract to a given school or school district, it would mean giving priority to a child to attend the preschool that serves as a feeder program to the kindergarten school in his or her local catchment area. This latter approach provides an incentive for local schools or districts to invest their own dollars in a preschool program because they know they will benefit when the preschool children subsequently enter kindergarten. The third principle would promote higher rates of participation, especially in the groups that could benefit most, if parents can readily understand when their child may be eligible and when and how to apply. To be cost-effective, the administrative burden on providers and other intermediaries should be minimized.

Delivery: Public Providers or Mixed Delivery

As discussed in Chapter One, the 38 states that have funded state preschool programs have adopted alternative approaches to how publicly subsidized preschool services are delivered. The two standard approaches are (1) delivery through public schools, in some cases with

¹⁰ The child development literature points to the importance of stable relationships with adult caregivers during the preschool years in order to form secure relationships that foster healthy emotional attachments and subsequent social and cognitive development (Shonkoff and Phillips, 2000; Thompson, 2002; National Scientific Council on the Developing Child, 2004).

the option that schools will subcontract out provision to other providers in the community, and (2) delivery through a combination of public providers (i.e., schools) and other CBOs (e.g., nonprofits; churches, synagogues, or other religious institutions; private schools). California's current approach falls in the second category, with a mixture of public and private providers receiving public subsidies to provide ECE services through the various federal, state, and local funding streams. The choice of models has often been driven by practical considerations, such as capacity, rather than evidence that one approach is likely to be more successful than another. Indeed, states have successfully been employing both models based on the evaluation evidence cited in Chapter Two.

For example, Oklahoma's universal preschool program is delivered through the public schools, although schools may choose to partner with Head Start programs or other CBOs, provided that the provider can meet the program requirements for state preschool (Barnett, Hustedt, Friedman, et al., 2007). The approach made sense in Oklahoma because declining enrollments in the K–12 grades made facilities and personnel available for the added prekindergarten grade (Kirp, 2007). However, many other states are not in that position, including California. Some have argued that, by delivering preschool programs through public schools, as Oklahoma does, preschools benefit from the existing public school infrastructure and the proximity facilitates the integration of preschool programs with the K–12 system (Clifford et al., 2005; Howes et al., 2008).

A number of other states, including Georgia and New Jersey, have successfully used a mixed delivery system to expand their state preschool programs. The greater reliance on a mixed delivery system in cases in which state funding for preschool is expanding has the advantage of drawing on the capacity of existing providers serving preschool-age children, either in formal preschool programs in public schools or private settings or in child-care centers or family child-care homes. However, a drawback of the mixed delivery system is that there may be considerable differences among providers in terms of existing quality. Some providers may readily modify their program services to meet the standards of a state-funded program, although it may be a challenge for

others to do so. California's experience with the PoP programs in several counties illustrates this challenge, as family child-care homes have been eligible to participate but few have been able to meet the more stringent quality standards in the PoP programs (Karoly, Reardon, and Cho, 2007a).

In general, there is little evidence in the research literature to suggest that school-based or non-school-based providers, *per se*, deliver higher-quality care and learning environments, holding all other inputs (such as teacher qualifications, group sizes, and child-staff ratios) constant (see, for example, Pianta et al., 2005, and Howes et al., 2008). There may be cultural differences between the two that are manifest in aspects of the environment, such as more large-group instruction in public preschools, similar to what is found in the elementary grades (Pianta et al., 2005). But it is not clear that such variations generate differential child developmental outcomes that are meaningful. There may be cost differences that, all else equal, would favor one type of provider over another. For example, if public schools have excess capacity, they may be expected to have lower cash outlays associated with facility costs than a non-school-based provider that does not own their own building. Although economists would account for the opportunity cost of using the school facility, not just the accounting costs, it may be the case that public school providers can deliver the same level of child benefits for lower cash costs. On the other hand, the cost differential could favor non-school-based providers if the school-based providers must pay their teachers on a higher unionized pay scale than non-school-based providers—again, for the same quality of teachers.

The choice regarding the delivery system also has implications for the provider-reimbursement mechanism. States that have opted to rely primarily on public schools may be able to fund the preschool program through the existing school-funding formula. Reliance on a mixed delivery system typically requires using grants or contracts to fund the set of mixed public and private providers or the use of vouchers allocated to eligible families with preschool-age children.

Quality: Regulation, Measurement, and Financial Incentives

The evidence of favorable effects of preschool programs comes from programs that have high standards for the services provided to children (Karoly, Greenwood, et al., 1998; Cannon and Karoly, 2007b). Typically, the effective programs have small group sizes, low child-staff ratios, developmentally appropriate curricula, lead teachers with postsecondary education (typically a bachelor's degree) and specialized ECE training, and ongoing professional-development supports. Some programs also include parent education or parent-involvement components, as well as other supports for children and their families (e.g., developmental screening). In addition to these structural features, effective programs are marked by processes in the classroom, such as providing a positive emotional climate, demonstrating a regard for children's perspectives, promoting higher-order thinking skills, and facilitating language development. Ultimately, these program features represent inputs into the production of child development outcomes in the cognitive, behavioral, socioemotional, and physical domains. At present, there is no formula for a given budget that indicates all the required program elements that, when combined, will be guaranteed to produce the maximum child development benefits in a one- or two-year preschool program.

In the absence of such a formula, there are several approaches for promoting quality in preschool programs in order to approach or achieve the maximum benefits for the dollars spent.¹¹ These include

- specifying minimum program features through licensing or other program regulation and then monitoring programs to ensure compliance
- using an independent accreditation process to evaluate multiple program features against standards that are associated with high-quality programs

¹¹ See National Early Childhood Accountability Task Force (2007) for a discussion of these approaches and other issues involved with improving ECE program quality.

- developing a QRS or QRIS based on independent assessments of multiple program elements that are combined into one or more summary measures expressed on a multipoint scale
- making information on licensing outcomes (status or inspections), accreditation status, and quality ratings available to the public in an accessible and transparent way
- providing financial incentives (e.g., a tiered reimbursement system) tied to achieving higher standards (e.g., accreditation) or quality ratings
- evaluating programs in terms of measured child developmental outcomes.

Some or all of these strategies may be combined (such as using a QRS tied to accreditation status, with results made publicly available, that is also used for tiered reimbursement).¹²

These strategies have their origin in efforts to boost quality in child-care settings more generally, starting with infants and toddlers and continuing to after-school programs. In a world of perfect information, parents—as consumers—would be able to judge the quality of the ECE settings they choose for their children, and poor-quality providers would not succeed in the marketplace. However, parents typically are not able to assess all of the relevant dimensions of quality and therefore do not have the expertise to identify which programs are likely to produce the most-favorable outcomes for their children (Zellman and Perlman, 2008). Some of the structural elements of quality are more readily observed—group sizes, child-staff ratios, cleanliness of the facility—but these features are not the only ones that matter. Although some may be positively associated with favorable outcomes, they are not very strong predictors (Duncan and Gibson-Davis, 2006). These same information asymmetries also apply to public or private funders that may subsidize providers directly through grants or contracts or indirectly through vouchers or payments to parents. The lack of perfect information leads to what economists call *market failure*, such that some parents select (or

¹² For example, McDonald (2009) reports that, as of 2007, 12 states linked their QRSs to tiered reimbursement and 13 states tied their QRSs to accreditation by NAEYC.

public or private agencies fund) poor-quality providers for a given price (or budget) because they are not able to distinguish between good and bad quality.¹³ Hence, there is a role for the government (in some cases, the private sector as well), through the approaches listed, in setting minimum standards through licensing or regulation or in supporting mechanisms to provide more-complete information about quality (e.g., accreditation or quality ratings).

At present, almost all states require licensing for center-based ECE programs and, in most cases, large or small (or possibly both) family child-care homes must be licensed as well.¹⁴ State licensing systems also include regular inspections (typically unannounced) to ensure compliance, and more states over time are making the inspection reports—both from routine visits and in response to complaints—publicly available on the Internet.¹⁵ Beyond licensing, other regulations apply to specific government-funded programs, such as the Head Start Performance Standards (which apply to Head Start and Title I programs) or the Title 5 regulations that govern the California State Preschool program. In most states, including California, the accreditation offered by organizations like NAEYC is undertaken on a voluntary basis and programs must bear the nontrivial costs associated with the process of self-study, candidacy, and site visit by independent professionals. Consequently, in California, only about 10 percent of center-based programs serving young children are NAEYC accredited (McDonald, 2009).¹⁶

¹³ Even with perfect information, parents may choose a lower-quality provider if there are no higher-quality options in their community or because they are trading off quality and distance (i.e., preferring a nearby provider of lower quality over a more distant, higher-quality provider) or quality and price.

¹⁴ As of 2005, Idaho was the only state with no licensing requirements for any type of child-care or ECE provider. Louisiana and New Jersey license centers but do not license family child-care homes of any size. All other states license both centers and either or both large and small family child-care homes (National Association of Child Care Resource and Referral Agencies [NACCRRA], undated).

¹⁵ NACCRRA (undated) reports that 17 states make inspection reports available online.

¹⁶ As of 2008, NAEYC had accredited 786 ECE programs in California serving about 65,500 preschool-age children (NAEYC, undated [b]). Given the size of the preschool-age cohorts in the state (approximately 1.1 million) and with close to 60 percent of preschool-age children in center-based programs (Karo, Ghosh-Dastidar, et al., 2008a), this trans-

However, as states link accreditation status to their QRSs, they are offering technical support or financial incentives (e.g., paying the associated fees or other costs) to support programs seeking accreditation. Finally, as part of the larger movement to encourage accountability in the provision of public services, states and localities have been implementing QRSs or QRISs, and, often, those systems are tied to a tiered reimbursement structure. As of 2008, 36 states had implemented or were implementing some form of a rating system for child care (Zellman and Perlman, 2008). In a number of states, accreditation status can be used to qualify for a given quality rating or is used as part of the rating process. Fewer states have yet to apply their child care–rating systems or a related system to publicly funded preschool programs.

Table 3.2 highlights some of the strengths and weakness of these alternative approaches to promoting quality, focusing on licensing or regulation, accreditation, and QRS or QRIS (where the latter includes feedback, technical assistance, and other supports that allow providers to reach higher quality levels). In terms of ease of implementation and costs, licensing and regulatory approaches are typically simpler and less costly than the alternatives, primarily because they tend to focus on a limited set of program features, usually structural factors that are relatively easy to measure and monitor. With this approach, the standards are usually minimum requirements to meet basic needs for health and safety, and there is no distinction between those that just meet the standards and those that go well beyond the standards. In return for higher costs, the use of an accreditation process or QRS/QRIS can address these drawbacks. Typically, accreditation by organizations like NAEYC sets a much higher bar than what is set for licensing or by other regulation and considers a broader range of program features that may include both structural and process elements. For this reason, the costs of determining whether accreditation standards are met tend to be higher. At the same time, the single rating—accredited or not—does little to differentiate providers below and above that threshold.

lates into an accreditation rate by NAEYC of about 10 percent of the California preschool-age population in center-based programs. This estimate is higher than the 5-percent accreditation rate for licensed centers cited by Nackman and Eiler-White (2007).

Table 3.2
Advantages and Disadvantages of Alternative Approaches to Promoting Quality

Approach	Advantages	Disadvantages	Other Issues
Licensing or regulation	Relatively simple to administer because limited measures are more easily observed and monitored Yes/no licensed status or standard achievement is easy for parents and the public to understand	Usually cover a limited set of structural features that are easiest to measure Usually, standards are quality minimums No incentive to go beyond standards	Minimum standards may be too low to support desired child outcomes Some providers may be exempt Need regular, independent inspection or assessment to ensure ongoing compliance
Accreditation	Can include a broader set of program structural features Standards are based on achieving excellence Yes/no accreditation status is easy for parents and the public to understand	Single rating (yes/no) does not differentiate those above and below the cutoff Valid accreditation process is costly, with costs typically borne by the program Providers may not have the resources to improve quality	Accreditation status may not reflect quality well or be associated with child outcomes Many providers choose not to participate when voluntary Which program features are included may lead providers to focus on the included and ignore the excluded Need regular reassessments to ensure that standards are still being met
QRS/QRIS	Can include a broader set of program structural features Multiple rankings provide room for and recognition of improvements Summary ranking measures are easy for parents and the public to understand	Valid QRS/QRIS process is costly, with costs borne by the provider or the government Providers may not have the resources to improve quality to the next level	Quality ratings may not measure quality well or be associated with child outcomes Some providers may choose not to participate if voluntary Which program features are included may lead providers to focus on the included and ignore the excluded Question of alignment if accreditation is allowed to substitute for rating Need regular assessments to ensure that standards are still being met

In contrast, the QRS or QRIS approach usually grades providers on a multipoint scale (for example, zero to five stars), so finer gradations along the quality continuum are recognized. Like accreditation, the QRS or QRIS can evaluate quality for a range of both structural and process features. To the extent that another goal of a QRS is to lead to quality improvements, providers may be limited in what they can do on their own, so additional funds are required to provide technical support and other resources to advance their quality ratings.

All of these approaches result in information about quality—licensed or not, accredited or not, quality rating at a given level—that is relatively easy for parents and the public to digest. However, in each case, the information is only valid to the extent that it is current. Thus, each approach requires periodic inspection or reassessment to ensure that standards are still being met or quality tiers are still being reached. Validity in each approach also means that what is measured or assessed is positively correlated with the quality of the care or learning environment and, ultimately, with the desired child development outcomes. With each of these approaches, there is no guarantee that this is the case. The narrow focus of licensing or regulatory approaches, coupled with the often minimal standards, suggests that this issue would be of particular concern for this approach. But it is also a concern with accreditation and QRS/QRIS—approaches that focus on a broader range of measures—as the quality measures used may not capture the construct they are intended to measure and the quality constructs featured may not be ones that are important for child development.

A number of studies provide information about whether the approaches in Table 3.2 actually differentiate between higher- and lower-quality settings or are correlated with child outcomes, especially in preschools. In the case of licensing, there has been relatively little effort to examine the effect or enforcement of licensing. One exception, a study by Witte and Queralt (2004), examined the effect in Broward County, Florida, of making the inspection reports for child-care centers available on the Internet, an approach implemented in 2001 by the county's child-care licensing and inspection office. The analysis showed that inspectors produced more reports and were more likely to provide mixed reviews, showing both positive and negative assess-

ments. They also identified a significant increase in the quality of the classroom environment in center-based programs, with a modest effect size but one comparable to what has been achieved by more-expensive approaches to quality improvement.

In terms of regulation, in our study of California preschool-age children in center-based settings, a larger fraction of children in the more highly regulated Title 5 programs were in classrooms that met quality benchmarks based on the ECERS-R and the CLASS than of children in centers that just have to meet the less stringent Title 22 licensing standards (Karoly, Ghosh-Dastidar, et al., 2008a). Even so, the fraction of children in either setting that met the benchmark was always less than half, indicating that even meeting the Title 5 standards was no guarantee of quality according to the two summary measures. Other research on child development outcomes indicates that the types of structural measures captured in licensing standards or state preschool regulations—class size, child-staff ratios, teacher credentials, and others—are not highly predictive of children’s language, preliteracy, and premath skills (Mashburn et al., 2008). Rather, these outcomes are more strongly associated with measures of process quality, such as the instructional support offered by teachers, quality dimensions that are harder to measure and typically not captured in licensing or regulatory standards.

Research on accreditation has produced mixed findings. The NAEYC accreditation process, dating back to 1985, is considered one of the most rigorous, with current standards covering ten areas that encompass both structural features and more process-oriented characteristics (McDonald, 2009; NAEYC, 2005, undated [a]).¹⁷ Zan (2005) examined 116 NAEYC-accredited preschool classes and found that the mean ECERS-R score was in the “good” to “excellent” range (5.77). Likewise, Gerber, Whitebook, and Weinstein (2007) found that sensitive caregiving was higher in NAEYC-accredited child-care centers. However, Zan (2005) found that there was a wide range in quality on a set of curricular measures, suggesting that the accreditation cri-

¹⁷ The Child Care Bureau of the ACF in HHS maintains a list of national accreditation organizations for early-childhood programs (ACF, 2009).

teria used at that time were not accounting for the quality of the curriculum. Whitebook (1996), in synthesizing studies examining a wide range of quality measures for accredited centers, also found considerable variability among accredited programs (see also Whitebook, Sakai, and Howes, 1997). None of these studies examined the relationship between accreditation and child development outcomes. In addition, those studies focused on NAEYC accreditation may no longer apply to the revised process that became effective in 2006 (NAEYC, 2005).

As noted by Zellman et al. (2008), the QRSs or QRISs in various states have generally not been evaluated to determine whether they are meeting their objectives of measuring (and improving) quality or whether they are ultimately linked to better child outcomes. In one of the first such studies, Zellman et al. (2008) evaluated Colorado's Qualistar child care–rating system developed by Qualistar Early Learning, a Colorado-based nonprofit. They identified a number of concerns, including measurement issues with components used to calculate the quality index that determined the one- to four-star rating, a lack of a strong correlation between the quality rating and measures of process quality not included in the rating system, and little relationship between the quality ratings and child outcomes. They conclude by noting that many of the QRSs in place are based on measures originally developed for low-stakes research purposes and they may not be valid in high-stakes contexts, such as for market-based quality ratings and tiered reimbursement systems. Hence, there is a need to carefully validate the QRSs in the contexts in which they will be used.

Infrastructure: Governance, Financing, Information Systems, and Other Supports

Beyond access, delivery, and quality, there are a host of other design elements for publicly provided preschool systems that we group under the heading of infrastructure.¹⁸ These components include governance,

¹⁸ Kagan (2007) also uses this terminology, although the system elements included differ to some extent.

financing and fiscal planning, information systems, learning standards and assessments, preschool and K–12 linkages, facilities, workforce development, communications, and other supports. These are key features that undergird a preschool system in terms of supporting other elements of the system, such as access, delivery, and quality, as well as system efficiency and effectiveness. Some of these linkages are illustrated in Table 3.3. For example, the governance structure provides the oversight for ensuring that the preschool program serves the desired population and that preschool providers deliver high-quality services. The financing system ultimately determines the resources available to potentially expand access or raise quality. Access and quality are monitored and improvements are made based on data collected through information systems, whereas communications with parents and the public build support for participation and quality. The delivery system and associated quality can influence the nature of linkages between the preschool period and subsequent K–12 education. The linkages may

Table 3.3
Relationship Between Infrastructure Supports and Access, Delivery, and Quality

Infrastructure Components	Preschool System Design		
	Access	Delivery	Quality
Governance	x	x	x
Financing and fiscal planning	x		x
Information systems	x		x
Learning standards and assessments		x	x
Preschool and K–12 linkages		x	x
Facilities	x	x	x
Workforce development	x	x	x
Communication with parents and public	x		x

SOURCE: Author’s analysis.
NOTE: x = link between the infrastructure element and the system design component.

go the other way in terms of learning standards and assessments affecting providers and quality. Access, delivery, and overall program quality all depend on having the required facilities and workforce—both in numbers and in their quality.

In Chapter One, we discussed some of these preschool program features and models that have been adopted in different states (see Table 1.1). For example, governance models include consolidation of various public programs that provide ECE services or related supports to a new agency, as part of an existing agency, or retain the existing agency structure but establish a new, high-level, multiagency coordinating body. Beyond federal funding streams, state financing sources include lottery and gambling revenues, earmarked taxes, and general revenues. Innovations in state data systems include integrating preschool into student-level longitudinal data warehouses.

In general, although these and other infrastructure elements can help support preschool systems in achieving adequacy or efficiency, there is little research evidence to provide guidance for choosing the approaches that will maximize children's developmental outcomes. Case studies provide insights into how systems evolve and their current effectiveness (see, for example, Fuller, Bridges, and Pai, 2007; Fuller and Wright, 2007; Whitebook, Ryan, et al., 2008), but there is no assurance that what works in one setting will necessarily be as effective in another. Thus, the approaches taken in other states provide relevant models and lessons learned, but the context of the existing system matters in considering what will work best in any given state.

Recommendations for Preschool Policy in California

Advancing preschool adequacy in California means increasing participation rates for more-disadvantaged children while raising quality for the same children, if not all children in preschool. In focusing on quality, policymakers can build on the success in delivering programs that do relatively well on such features as group size and child-staff ratios and advance higher quality for program features that are more likely to fall short of quality benchmarks and are important for child development. The quality features for which there is room for improvement include preparing and supporting teachers to use approaches in the classroom that foster the readiness skills that have been demonstrated to be effective in promoting success in kindergarten and beyond. In terms of efficiency, there are opportunities to get more out of the nearly \$2 billion currently devoted to the system of publicly funded ECE programs for preschool-age children. If new monies are available to add to the system, they should be put to their most effective use in terms of promoting school readiness and subsequent education success.

The four key preschool design elements—access, delivery, quality, and infrastructure—and the associated evidence base discussed in Chapter Three provide a framework for building a new preschool system from first principles, as well as guidance for reshaping an existing system. Using the frame of adequacy and efficiency, in this chapter, we consider options and associated recommendations in order to support the following preschool policy goals in California:

- Increase access, especially for underserved groups.

- Raise quality, either for underserved groups or across the board, especially for those quality dimensions with the biggest shortfalls.
- Advance toward a more efficient and coordinated system.
- Provide appropriate infrastructure supports.

The first two goals address adequacy, the third goal addresses efficiency, and the fourth goal supports both adequacy and efficiency.

We also take into account the fact that the system of publicly funded ECE programs has a second goal in addition to promoting child development: providing child care in support of working parents (Karoly, Reardon, and Cho, 2007a). In some cases, policies designed to achieve these four objectives will not detract from the ability to support working parents. In other cases, policies that will advance these objectives may conflict with the work-support goal.

The discussion in this chapter of policy options and recommendations does not address specific approaches for responding to the current fiscal crisis in California, the current state of the U.S. economy, or any policies responding to those circumstances. Even in a period when resources are tight, there may be an opportunity to institute policies that reshape the preschool system in California so that it can operate more effectively with current resources and be ready to respond in the event that new resources become available. For this reason, throughout the discussion of policy options, we differentiate those options that do not require new resources (and may even save on existing resources) from those that are possible only when new monies become available.

In particular, in the discussion that follows, we first address recommendations under the assumption of “no new resources” (or only modest increases in resources) before turning to those recommendations that are feasible only under a “more resources” scenario. We view the former as effectively on a near-term horizon (one to three years), whereas the latter is more realistically viewed as on a medium-term horizon (three to ten years). If policy changes in the former category result in resource savings, the resources that are saved could be used to implement policy options in the second category. A summary of the

recommendations that follow in the rest of the chapter in these two categories is provided in Table 4.1.

Using Existing Resources to Create a More Efficient and Coordinated System with Appropriate Infrastructure Supports

Of the four policy goals for California, the first two—expanded access and increased quality—will require an infusion of new resources to make a significant improvement on either the access or quality dimension. In the absence of new resources being made available, attention can focus on the last two policy goals: developing a more efficient and coordinated system with a supportive infrastructure. To this end, we discuss a series of recommendations in the access, delivery, quality, and infrastructure domains through which specific policy changes can contribute to greater efficiency and infrastructure supports.

Access: Ensuring That Children Who Can Benefit Most Are Served First

At least in the short term, we can expect that California will continue to lack the funding to serve all preschool-age children who are eligible for subsidized ECE. To gain the most benefit from the resources that are expended, there is an opportunity to restructure the way in which children are allocated to the available spaces in order to achieve greater benefits.

Recommendation: Align the eligibility determination process and allocation of children to slots with the policy objective of first serving children who can benefit most. As discussed in more depth in Karoly, Rendon, and Cho (2007a), California currently makes subsidized preschool programs available on a targeted basis to both three- and four-year-olds with the exception of several California counties that have indicated a commitment to reaching universal access.¹ As shown in Table 4.2,

¹ As of 2009, San Francisco is expected to be the first county that achieves universal access for all four-year-olds.

Table 4.1
Summary of Policy Recommendations for the Shorter and Longer Terms

Domain	Recommendation
a. With no new resources	
Access	Align the eligibility determination process and allocation of children to slots with the policy objective of first serving children who can benefit most
Delivery	Modify the contract mechanism for Title 5 and AP programs to reduce the extent of unused funds and other inefficiencies Implement a common reimbursement structure within a system with mixed delivery and diverse funding streams
Quality	Increase the routine licensing inspection rate for child-care centers and family child-care homes and make inspection reports publicly available on the Internet Develop and pilot a QRIS and tiered reimbursement system as part of the state's larger effort to create an Early Learning Quality Improvement System
Infrastructure	Evaluate options for alternative governance structures in terms of the agencies that regulate and administer ECE programs, and change the structure if greater efficiency and effectiveness can be obtained Make greater use of the option to allocate Title I funds for preschool programs Fund the implementation of the P-16 longitudinal data system envisioned under recent legislation (SB 1298) Examine the adequacy and efficiency of the workforce development system for the ECE workforce and make recommendations to align with future preschool policies
b. With new resources	
Access	As access to preschool is extended, prioritize serving a larger share of currently eligible four-year-olds and three-year-olds in poverty As access to preschool is extended to a larger share of the population, consider combining geographic targeting with income targeting
Quality	Use a multipronged strategy—with an emphasis on measurement and monitoring, financial incentives and supports, and accountability—to promote higher-quality preschool experiences in subsidized programs
Infrastructure	Address workforce, facility, and other infrastructure supports needed to provide high-quality preschool for children currently eligible and those who will be eligible under any future expansion of eligibility

SOURCE: Author's analysis.

Table 4.2**Eligibility Criteria for Publicly Funded ECE Programs Serving Preschool-Age Children in California**

Program	Income		Receiving Child-Protective Services or at Risk of Abuse, Neglect, or Exploitation	Other Criteria
	Federal Poverty Guidelines	CDE Income Ceilings		
Title I preschool	x			In catchment area
Head Start	x			
CalWORKs stages 1, 2, and 3		x		Need
AP		x	x	Need
California State Preschool		x	x	Need (for full-day services)

SOURCES: Karoly, Reardon, and Cho (2007a, Table 3.1); CDE (2008).

NOTE: This table reflects the consolidation of California State Preschool program, General CCD, and PKFL that takes effect on July 1, 2009. Migrant CCD, Cal-Learn, and Cal-SAFE programs are excluded, as they target even more-specialized populations.

the targeting mechanisms for the main ECE programs (accounting for the consolidation of the California State Preschool program as of July 2009) differ by funding stream, such as using the federal poverty cutoff for Title I and Head Start funding but 75 percent of SMI for the AP, CalWORKs stages, and California State Preschool programs.² The variation in eligibility criteria can create confusion for families regarding their eligibility for different programs. Since current funding is not sufficient to serve all eligible children, stated priorities in the eligibility determination process for California Title 5 programs administered by CDE are to serve the lowest-income children first and four-year-olds before three-year-olds. Although this approach is consistent with the strategy discussed earlier of serving the children who

² As noted earlier, the 2007 reauthorization of Head Start allows programs to enroll up to 35 percent of children with family income between 100 and 130 percent of the poverty line, but most enrollments are still likely to go to children with income below poverty.

will benefit the most, we know that the rationing system is not perfect, in that higher-income children are served while there are still lower-income children on the waiting list. Likewise, eligible three-year-olds are served while some eligible four-year-olds are not.

Some movement toward a system more aligned with child development goals will take place as part of the California State Preschool program consolidation that will become effective in July 2009. In addition to combining five separate Title 5 contracts into one, the new system will have the following features:

- Eligibility determination for the California State Preschool program is made at the time of enrollment, and then children remain eligible for the part-day program for the remainder of the program year.
- The part-time California State Preschool program is free to all children. Family fees may apply for extended full-day or year-round care, depending on family income.

The development and use of the Centralized Eligibility List (CEL) has the potential to rationalize the assignment of children to slots compared with the more decentralized system used in the past.³ However, the system will be more effective when information in the CEL is current and allocation decisions can be made in a more coordinated fashion. For example, families are placed on the CEL without a formal determination of eligibility. The provider determines eligibility later, when a family appears on its list of potential eligibles, but a family may in fact no longer be eligible at that time. This places a burden on providers in terms of screening and time costs and would be expected to be less efficient than a centralized eligibility determination process.

³ The CEL became operational statewide in 2006, replacing a decentralized system of separate waiting lists maintained by each CDE contractor. Families that are seeking subsidized care in CDE-administered programs are placed on the CEL, along with information that determines their priority on the waiting list (e.g., based on income and the age or other characteristics of the child) and any location or provider preferences. The centralized process aims to place families with the highest priority first when openings become available. See Karoly, Reardon, and Cho (2007a) for additional detail and discussion of some of the limitations of the current system.

With current funding levels that do not allow all income-eligible children to participate in subsidized ECE programs, changes to the eligibility determination process should be made to achieve the following objectives:

- All four-year-olds who participate in subsidized ECE are enrolled, for at least part day, in a developmentally oriented preschool program, such as Head Start, California State Preschool program, or other equivalent locally administered program, and children remain eligible for the program year.
- For enrollment of three-year-olds, the process should target children with income below poverty and provide two years of developmentally oriented program services in Head Start, California State Preschool program, or other equivalent locally administered program for at least part day.

Achievement of these objectives will need to overcome the still complex system illustrated in Figure 1.1 in Chapter One. In particular, there needs to be better coordination for preschool-age children eligible for subsidized ECE through the CalWORKs stages and the non-CalWORKs AP program to ensure that the four-year-olds benefit from developmentally oriented programs and that investments that begin when children are three years old are maximized through continuation of services for a second year. Likewise, there is a need for greater coordination between Head Start and the California State Preschool program to allocate children between the two programs given the differences in income eligibility thresholds.

There are a number of strategies in the eligibility determination process and process of allocating children to slots that could support a more coordinated system across funding streams. Consideration should be given to

- centralizing the eligibility determination process at the county level or lower (e.g., through county offices of education [COEs]). This would provide information for counties in terms of overall levels and geographic distribution of unmet need. This informa-

tion can be used in making future funding-allocation decisions and in planning for program expansions.

- determining eligibility for participation in part-day, developmentally oriented programs at the time of application and placement on the CEL. Children would remain eligible for the part-day program even if family circumstances change by the time the program begins. Eligibility for subsidized extended-day programs could be determined conditionally at the time of application and finalized based on current information at the time the program begins (where a reduction in need may change or eliminate eligibility).
- structuring the enrollment process to coincide with an academic-year schedule, with a common application period for Head Start, California State Preschool program, locally funded preschool programs, and children with eligibility through CalWORKs and non-CalWORKs AP programs. The common application period could be set locally to match the school calendar year and disseminated to the public through schools, resource and referral agencies, and other CBOs. Once the initial enrollment process is completed, children who were not offered a space or children who become eligible after the enrollment process is completed could be accepted on a rolling basis as cancellations and transfers make new openings available or as vacancies otherwise arise during the program year.
- using the common application period to more optimally allocate children to slots, with priority given to four-year-olds over three-year-olds and to three-year-olds below poverty over three-year-olds in higher-income families, and to a second year of enrollment in the same program for children who started in developmentally oriented programs at age three and whose parents request continuation in the same program. If there are more children in a given priority grouping than available slots, a lottery may be used to select those who will be offered a place. The allocation process could also give priority for school-based programs to enroll prioritized children who reside in their school's catchment area. The system could also accommodate parents' geographic preferences.

Similar coordinated recruitment and placement efforts are being used in several of the counties (see the examples provided by Karoly, Reardon, and Cho, 2007a). These and other approaches can be piloted in counties or other local areas to determine what approaches will be efficient and effective.

Delivery: Reduce Inefficiencies in Contracting Mechanisms and Standardize Reimbursement Structures

Even in a period when access to subsidized preschool programs is not increasing, there is still an opportunity to implement policy changes to reduce inefficiencies so that existing resources are used even more effectively. Any savings may support an increase in access or may be used to make advances in other areas, such as quality improvements.

Recommendation: Modify the contract mechanism for Title 5 and AP programs to reduce the extent of unused funds and other inefficiencies. As discussed in Karoly, Reardon, and Cho (2007a), one of the inefficiencies in the current system is the extent to which funds allocated in any given year for ECE programs serving preschool-age children are not spent. This occurs most prominently in the state Title 5 contracts, but also in the CalWORKs and non-CalWORKs AP programs. The issue of unspent funds—either unearned or unallocated—arises for a number of reasons, including contracting delays, program start-up delays, a mismatch between available spaces and the community needs, extended vacancies, and providers opting out of the contract system in favor of the voucher system. The current system does not have much flexibility to reallocate funds either within or across years in response to changes on either the demand or supply side or to make new allocations as funds become available. As a result, fewer children are actually served than the number that the funding will allow.

In general, in a subsidized ECE system serving a person-based targeted population, the allocation of geographically based subsidized ECE slots by contracts to providers has greater potential to generate a mismatch between children and spaces than allocations made directly to the child. However, it is possible to improve the contracting mechanism to make it more efficient. The San Mateo County Child Care Subsidy Pilot Project (AB 1326) incorporated a combination of higher

contract reimbursement rates and greater flexibility to shift funds across contractors in response to changes in enrollment demand. The evaluation to date has shown that the pilot program successfully increased child enrollment days with the same budget and greatly reduced the problem of unspent funds (see the discussion in Karoly, Reardon, and Cho, 2007a). This experience indicates that changes to the contracting mechanism can lead to greater numbers of children being served with the same budget.

Building on recent recommendations made by the California Legislative Analyst's Office (LAO) (2008a, 2008b), the following modifications to the contracting process should be considered:

- a mechanism to expedite the allocation of some or all of new monies or returned funds to existing contractors in good standing or to counties (e.g., COEs) for allocation to contractors
- a mechanism to reallocate funds in a given year across different contractors based on demand (i.e., as in the San Mateo pilot program)
- a shift toward grant-based contracts that specify minimum enrollment or attendance requirements, such as those used by the federal government to fund Head Start.

The reallocation of funds in the case of the first two mechanisms could take into account information about unmet need, particularly for high-priority populations, from the more coordinated eligibility determination process discussed earlier.

Recommendation: Implement a common reimbursement structure within a system with mixed delivery and diverse funding streams. The current system of subsidized ECE programs uses different mechanisms for reimbursement across different programs: grants for Head Start, contracts for state Title 5 with a standard reimbursement rate, and voucher-based reimbursement rates for AP providers based on regional market rates (RMRs) (see Karoly, Reardon, and Cho, 2007a, for additional detail). This variation in reimbursement mechanisms is largely the result of having multiple funding streams, but it is also a consequence of using a mixed delivery system of school-based programs

with non-school-based providers. This variation, however, can result in substantially different rates of reimbursement by program type. As noted in Karoly, Reardon, and Cho (2007a), as of 2006, the RMR exceeded the standard reimbursement rate in the 22 counties where about 80 percent of the preschool-age population resides. Consequently, some providers may opt out of parts of the ECE subsidy system with lower reimbursement rates in favor of those parts of the system with higher reimbursement rates.⁴

Although it may not be possible, at least in the short run, to use a common reimbursement mechanism for all subsidized ECE for preschool-age children in California (e.g., the Head Start funding mechanism is determined by federal policy), the structure of the reimbursement system can be standardized. Ideally, that system would include the following elements:

- reimbursement rates that vary by geography to reflect differences in cost of service provision
- the standardization of reimbursement rate differentials for specialized populations served (e.g., children with disabilities or who are ELLs)
- the standardization of reimbursement rate differentials for intensity of services provided, such as the length of the day or year (including consistent definitions of the hours or days that are used to comprise *part* and *full*)
- common treatment of administrative costs.

If tiered reimbursement structures associated with quality are used as well, that would be another dimension for equal treatment.

⁴ Karoly, Reardon, and Cho (2007a) cite the example of Orange County relinquishing its Title 5-center contracts in 2000 because reimbursement rates were too low, as well as data from CDE indicating that the low reimbursement rate was cited as a reason for voluntarily relinquishing close to half of the nearly 57 contracts that were given up in a two-year period.

Quality: Build a Foundation for Future Investments

In the absence of new resource commitments, there are several steps that California can take toward raising quality in the state's ECE programs serving preschool-age children. The two recommended actions that follow pertain to activities that will provide a foundation on which to build should new resources become available. Although the first recommendation will require new resources, it is a long-neglected area of investment in the quality of child care in California that should be remedied, with a modest investment, in the near term.

Recommendation: Increase the routine licensing inspection rate for child-care centers and family child-care homes and make inspection reports publicly available on the Internet. In most state preschool systems, licensing is an important foundation for ensuring that at least minimal standards for health and safety are met in center-based programs or family child-care homes. Although California licenses both types of settings, it is notable for having one of the lowest routine inspection rates. In the absence of a complaint, most states require an unannounced inspection every one to two years; 13 states require routine inspections at least twice each year (NACCRRRA, undated). By statute, California requires an inspection every five years (20 percent of facilities per year), but, with funding fluctuations in recent years, the inspection rate has ranged from 10 to 30 percent (LAO, 2006, 2008a). In addition, California does not make the inspection reports readily available to the public either through the Internet or by other means.⁵ In light of this relatively lax level of enforcement and weak transparency, it is noteworthy that the health and safety data collection by Karoly, Ghosh-Dastidar, et al. (2008a) for center-based ECE programs in California found that only 74 percent of preschool-age children were in center-based programs that met a set of 12 routine health and safety practices. Examples of frequently missed practices were having covered electrical outlets, secured exits, and a fire extinguisher in the classroom, all required elements under California Title 22 licensing standards.

⁵ To see the inspection results, a request must be made to see the facility's file through the local child-care regional or county office. See Nackman and Eiler-White (2007) for a discussion of current requirements for licensing and dissemination of the results.

As a critical first step to further advancing the quality of ECE programs, we recommend that California provide sufficient resources to increase the inspection rate to 50 percent or higher and make inspection reports from routine visits and those prompted by complaints available on the Internet.⁶ Issues of enforcement identified by the LAO need to be addressed as well (LAO, 2006, 2008b). In making inspection results public, the Community Care Licensing Division of the CDSS should study the approaches taken in other states to identify effective practices in terms of the information that is made available and how to best gain the support of providers and best publicize the availability of the information to parents and the public more generally (see, for example, the discussion in Witte and Queral, 2004, regarding Florida's experience). Although this recommendation will require additional resources, greater enforcement of the state's licensing standards will provide an important base from which to build other quality improvement efforts.⁷ Moreover, if the Florida experience with making inspection results readily available proves generalizable, California could expect to see an increase in the quality of the inspections and an increase in the quality of the programs inspected (Witte and Queral, 2004).

Recommendation: Develop and pilot a QRIS and tiered reimbursement system as part of the state's larger effort to create an Early Learning Quality Improvement System. With the passage of SB 1629, California is already in the process of considering options for both a QRIS and tiered reimbursement system as part of its larger Early Learning Quality Improvement System. As that development effort continues, consideration should be given to the following key design issues:

- whether participation is voluntary or mandatory and what types of providers will be included

⁶ Some of the additional costs could be recovered through increased licensing fees (LAO, 2009).

⁷ The Nackman and Eiler-White (2007) estimates that making licensing inspection information available on the Internet would require a very modest budget increase of about \$400,000.

- what dimensions of quality to incorporate into the system and how they should be weighted
- what measures should be used to capture the quality constructs and how the quality measures should be collected
- the role for self-assessed measures (e.g., environment-rating scales)
- whether to integrate state licensing into the system
- whether to account for accreditation status
- how many tiers to include in the rating scale
- whether the rating scale is based on an additive point system or meeting thresholds within multiple domains
- how to incorporate quality improvement mechanisms into the system
- the nature of the associated public-awareness campaign
- how to evaluate the system.

In making these choices, California can learn from the efforts in other states to develop QRISs for their child-care or preschool programs. For example, Zellman and Perlman (2008) examine issues of implementation and lessons learned from the implementation of QRISs in five leading states: Colorado, North Carolina, Ohio, Oklahoma, and Pennsylvania. Their recommendations include the following: Pilot the QRIS and make refinements before full-scale implementation; minimize the use of self-reported data, although self-assessed environment-rating scales can be useful at some levels of the system; integrate licensing into the system but consider carefully the use of accreditation as a quality component; and evaluate whether the QRIS meets its intended goals.

The use of QRSs and tiered reimbursement in the nine California counties implementing PoP programs also provides a laboratory for discovering what works and what does not, and for further development and piloting of QRISs. For example, the rating systems in use by the PoP counties are generally limited to a few indicators of quality (e.g., some combination of an environment-rating scale, teacher education and training, group sizes, and child-staff ratios) (Karoly, Reardon, and Cho, 2007a). Programs must meet a threshold for each quality

indicator (what is called a *block system*), and there is no weighting across quality indicators. The PoP program rating systems have yet to incorporate other aspects of quality, such as process indicators. Nevertheless, these systems provide an important baseline from which to build.⁸

Infrastructure: Look to Evidence of Best Practices for More-Effective Support

In general, the system elements we have placed under *infrastructure* are often vital support components for an effective preschool system. In the absence of new resources, the primary opportunity in this domain is to undertake focused efforts to examine the current system against evidence of the effectiveness of alternative approaches used in other states and put in place well-considered plans for change. We highlight several of these types of initiatives with specific recommendations regarding governance, funding, information systems, and workforce development. But similar approaches may be implemented for any of the components listed in Table 3.3 in Chapter Three.

Recommendation: Evaluate options for alternative governance structures in terms of the agencies that regulate and administer ECE programs, and change the structure if greater efficiency and effectiveness can be attained. As noted in Chapters One and Three, as states have expanded their commitment to state-funded preschool programs, some have restructured their governance systems in recognition of the gains in efficiency and effectiveness. Alternative models implemented in other

⁸ A synthesis of the evaluations of the PoP programs across the nine implementing counties shows that providers achieved global quality ratings, as measured by the ECERS-R, in the good to excellent range (the average is about 5.5, with a range of about 5 to 6 across the nine counties) (Prayaga, forthcoming). These ECERS-R ratings, although not strictly comparable with those collected for this study because they use the full ECERS-R scale, exceed those measured for the typical preschool-age child in a center-based program in California (Karoly, Ghosh-Dastidar, et al., 2008a). Likewise, the CLASS scores measured for a subset of PoP programs in San Francisco and San Mateo counties exceeded those measured in this study for center-based programs serving preschool-age children (see AIR, 2007, and Karoly, Ghosh-Dastidar, et al., 2008a, for more detail). Together, these results indicate that the PoP programs, with their emphasis on technical support to achieve higher quality and financial incentives to compensate for the added costs of higher quality, have been successful in raising quality into the range associated with effective preschool programs.

states (see the examples discussed in Chapter One) include consolidation into a new agency, consolidation into an existing agency, or the establishment of a new high-level, multiagency coordinating body to work across existing agencies.

California, like other states, has multiple agencies with responsibilities for various aspects of the ECE licensing, regulation, financing, and delivery system. The most obvious division is in the responsibilities that fall under CDSS (licensing of centers and family child-care homes that serve preschool-age children and administration of CalWORKs Stage 1) versus CDE (administration of CalWORKs Stages 2 and 3 and general AP program, the California State Preschool program, and several smaller programs and coordination with Head Start). Even if there is no change in structure, consideration can be given to greater coordination on such functions as data collection and quality improvement initiatives.

Recommendation: Make greater use of the option to allocate Title I funds for preschool programs. In the absence of new funding, one strategy is to determine whether flexible funding streams can be reallocated to devote more resources to preschool programs. One such source is federal Title I funds. As discussed in Chapter One, although NCLB emphasizes the use of Title I funds for this purpose, many states have yet to take advantage of this approach. In California, with the support of county First 5 commissions, several counties and school districts within counties have adopted this approach in order to increase funds available to supplement existing programs (and therefore raise quality) or to fund new preschool spaces (see Karoly, Reardon, and Cho, 2007a, for examples).

Of course, allocating Title I funds for preschool programs represents an opportunity cost in terms of the alternative use of those funds for programs serving children in kindergarten and beyond. New funds for Title I under the ARRA may lessen that trade-off, at least in the short term. However, to the extent that funds spent raising preschool quality or increasing preschool access can generate pay-offs in terms of subsequent school performance (e.g., higher achievement, less grade repetition, reduced special-education use), districts that reallocate funds to effective preschool programs can expect to see

a return in terms of reduced education costs in the K–12 years.⁹ The alignment of the early investment and later returns within a given school district provides the right incentives for districts to make this trade-off. At the same time, districts would presumably be less likely to allocate such funds to preschool programs attended by children who will not enroll in their K–12 programs—hence, our earlier recommendation to give priority for subsidized school-based programs to the enrollment of children who reside in their catchment area.

In addition, to further incentivize districts in this direction, the state could consider allocating matching funds for districts that use Title I funds for preschool quality improvements or program expansions. In this way, the state can leverage funds under its control with funding under local control.

Recommendation: Fund the implementation of the P–16 longitudinal data system envisioned under recent legislation (SB 1298). California is lagging other states in the development and implementation of education data systems that will link student- and teacher-level data over time and support informed decisionmaking about education policy at the local and state levels (Hansen, 2006). Implementation of the K–12 data system comprised of core elements with student- and teacher-level data—namely, CALPADS and CALTIDES—has been slow, and efforts to integrate preschool data into the system have only just begun. Providing the funds necessary to fully implement the system should be a priority. Here again, there are any number of states that provide models for effective data systems and how the information has been used in support of policymaking.

⁹ Estimates of the effects of preschool on subsequent school performance are based on the status quo allocation of Title I funds in the elementary grades. Thus, it is possible that moving Title I funds from the K–12 years to the preschool years would attenuate the effectiveness of preschool if the Title I funds are used for services that complement or extend the effects of the preschool services. On the other hand, the Title I funds allocated for the K–12 years may be put toward ineffective services or services that are less effective than the preschool services, so the trade-off may still be favorable. It also worth noting that the Chicago CPC program, as evaluated, was funded with Title I monies. Thus, the substantial educational benefits from that program were achieved by redistributing Title I funds to the preschool years.

Recommendation: Examine the adequacy and efficiency of the workforce development system for the ECE workforce and make recommendations to align with future preschool policies. For access to high-quality preschool to expand, it will be vital to have a larger, more qualified workforce in place to serve potential future increases in the number of children served. In the shorter term, a constructive initiative would be to undertake an evaluation of the adequacy and efficiency of the system of supports for the ECE workforce in California today. The issues to be examined would include the following:

- What workforce competencies are required for the current ECE system or one that is scaled up?
- What is the current supply of the ECE workforce vis-à-vis the required competencies?
- How effective is the existing education and training system in preparing the ECE workforce to deliver high-quality preschool programming?
- What resources are currently available to support the ongoing professional development of the ECE workforce, and what are the constraints on how those resources are used?
- What are the barriers to advancing the competencies of the current ECE workforce or to attracting new entrants?
- What should be the structure of an ECE workforce development system for California?

Some of these issues have been examined in whole or in part in other analyses at the state or national level (see, for example, Whitebook, Sakai, Kipnis, et al., 2006a, 2006b; Center for the Study of Child Care Employment, 2008; LeMoine, 2008). The key to this effort will be to integrate the existing information with new findings in such a way that policymakers will have a perspective of the systemwide changes that are needed, rather than taking a piecemeal approach.

Using New Resources to Expand Access and Raise Quality

Of the four policy goals listed earlier, we noted that increasing access and raising quality would require additional resources in order to make significant changes. Some of the recommendations in the preceding section may make progress toward this goal, but more significant advances will likely require greater levels of funding. In addition to recommendations regarding access and quality, we also discuss the infrastructure supports required to meet the objectives of higher quality and expanded access.

Access: Expand First to Those Who Will Benefit Most

In considering access, we do not make a specific recommendation for universal preschool. The merits of targeted versus universal programs were discussed in Chapter Three, and, ultimately, the extent of future program expansions will depend on the weights placed on the arguments in favor of or against the two approaches. Nevertheless, we concluded that California was likely on a portion of the curve illustrated in Figure 3.1 where additional positive returns would flow from expanded investment in targeted, high-quality preschool programs. A more targeted approach also had merit in terms of narrowing achievement gaps, as discussed in Chapter Two. Thus, our recommendations focus on options for achieving future expansions in a targeted fashion.

Recommendation: As access to preschool is extended, continue to target four-year-olds and three-year-olds in poverty. Given that current funding levels from all sources are not sufficient to support high-quality ECE for currently eligible three- and four-year-olds, the first step is to expand access to those who are already classified as eligible. Using the principal of targeting those who will benefit the most, we would recommend continuing to place a priority on four-year-olds over three-year-olds and, among three-year-olds, those with income below poverty. Once those groups are served, coverage can extend first to currently eligible three-year-olds with income above poverty and to four-year-olds with income above 75 percent of SMI.

As these expansions take place, one consideration would be to account for geographic differences in the cost of living in setting the

income threshold for eligibility. This adjustment could be phased in when new resources make it possible to reach participation rates of 80 percent or more among those in poverty. Otherwise, children with higher family income in high-cost counties could crowd out those in lower-cost counties with low income who have yet to be served.

Recommendation: As access to preschool is extended to a larger share of the population, consider combining geographic targeting with income targeting. As discussed in Chapter Three, there are alternative strategies for providing a subsidized preschool program to a targeted population. If the goal, for example, is to serve all four-year-olds with income below 75 percent of the SMI, program eligibility could be person based—i.e., based on a determination of family income. Alternatively, the program could be place based, serving all children in communities with high concentrations of the target population (i.e., income below 75 percent of SMI). In terms of administrative costs, place-based eligibility is likely to be less costly per person, since it is usually easier to determine eligibility based on residence than on less well-measured, personal characteristics.

However, administrative cost is not the only consideration. The efficiency of the targeting mechanism should also be accounted for. By *efficiency*, we mean maximizing the share of the target population that is served while minimizing the fraction of the nontarget population that is served, conditional on a given overall budget. Using the example of a target population defined by family income, with person-based eligibility, only income-eligible children would be allowed to participate. But there may be inefficiencies if a lack of information about the program or stigma prevents many eligible families from participating. In addition, since screening mechanisms are usually not perfect, some children may be determined to be eligible when, in fact, they are not. With place-based targeting, unless there is perfect residential segregation by the targeted characteristics, targeting will not be perfect, so there will again be inefficiencies. In particular, communities with high concentrations of the target population will also include children who are not in the target population but whose parents would choose to have them participate in the place-based program. Likewise, some children in the target population will live in communities that are not tar-

geted by the place-based criterion and therefore would not have access to the program.

A third alternative is to combine the two approaches: Serve all children in selected communities with high concentrations of the target population and, in all other communities, use person-based eligibility to serve all remaining children.¹⁰ If the targeted population is small and geographically dispersed, then person-based targeting is likely to be more efficient in terms of maximizing the share of the targeted population served and minimizing the fraction of the nontargeted population served, for a given budget. As the size of the targeted population expands relative to the nontargeted population or as the targeted population becomes more geographically concentrated, place-based eligibility is likely to be more efficient. Thus, if, in the future, California opts to expand preschool coverage to a broader population than the current eligibility, shifting toward place-based eligibility is likely to generate efficiency gains in terms of targeting.

To examine more closely the implications of using place-based eligibility, person-based eligibility, or a combination of the two to determine eligibility for subsidized preschool programs, we use the data we collected as part of the larger study effort to model the effect of alternative eligibility rules. In particular, we matched the 2,025 preschool-age children in our family sample by ZIP Code to the percentage of elementary-school students eligible for FRPMs in their ZIP Code.¹¹

¹⁰ This approach has been under consideration in New Jersey, where all low-income three- and four-year-old children would be eligible for the state-funded preschool program, as well as all children—regardless of income—in the school districts with the highest concentration of disadvantaged children (Barnett, Hustedt, Friedman, et al., 2007).

¹¹ A child is eligible for FRPMs if his or her family's income is below 185 percent of the poverty line. We were not able to match the child sample to the FRPM eligibility rate for the elementary-school catchment area in which children reside, so we use a summary measure of the FRPM eligibility rate for all elementary schools in the ZIP Code. The ZIP Code-level measure was weighted by the number of kindergarten students in each elementary school in the ZIP Code. The school-based data come from matching, by school ID, three school-level data sources available from CDE: the Public Schools Database (for school ZIP Codes), the California Basic Educational Data System (CBEDS) school-information form (for school enrollment data by grade), and the API data files (for the schools' 2007 percentage of students eligible for FRPMs).

(Details on the targeting analysis, as well as results using school-level API scores as an alternative place-based targeting mechanism, are available in the appendix.) Using reported family income, we have also classified children by their income eligibility for ECE subsidies in California under current eligibility rules:

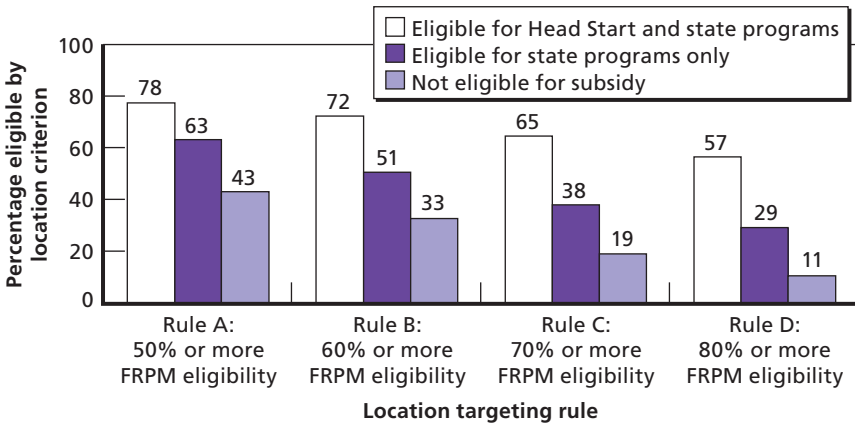
- eligible for Head Start and state-funded programs (i.e., income below poverty)
- eligible for state programs only with a full or partial subsidy (i.e., income above poverty but below 75 percent of SMI)
- not income eligible for any federal or state subsidized ECE.

Based on income alone, a form of person-based targeting, we estimate that about 53 percent of preschool-age children in California would be income eligible for a subsidized ECE program (see Karoly, Ghosh-Dastidar, et al., 2008a, for more detail).

Instead of person-based eligibility, we consider several alternative place-based eligibility rules based on the share of elementary-school students in the child's ZIP Code who are eligible for FRPMs, with results shown in Figure 4.1. If place-based eligibility is conferred upon those children in ZIP Codes where 50 percent or more of children are FRPM eligible (rule A), then about 78 percent of children with the lowest income (the Head Start and state program eligibility group) would be eligible, but so would 43 percent of those who are not currently eligible for ECE subsidies based on family income. The middle income group falls between these two extremes. This means that rule A will miss more than 20 percent of the lowest-income children because they reside in communities with less-concentrated poverty and that share is closer to 40 percent for the next-highest income group. As the place-based targeting rule increases from 50 percent or more FRPM eligible in the ZIP Code (rule A) to 80 percent or more FRPM eligible (rule D), the place-based eligibility rate falls for all three income groups because fewer children at any income level are in ZIP Codes with high concentrations of poverty.

Figure 4.1

Percentage of Preschool-Age Children in California Estimated to Be Eligible for ECE Subsidies Under Alternative Place-Based Targeting Rules, by Income-Eligibility Status



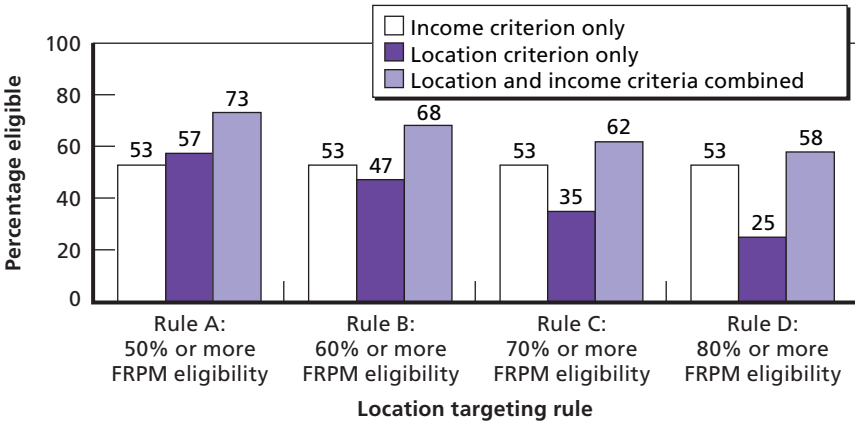
SOURCE: Author's analysis based on 2007 CDE data on FRPM eligibility rates by school and RAND California Preschool Study household survey data. See Table A.1 in the appendix.

NOTE: Place-based or location targeting rule is based on percentage of elementary-school students in child's ZIP Code who are eligible for FRPMs.

RAND MG889-4.1

As shown in Figure 4.2 and noted earlier, the person-based eligibility criterion based on family income generates an eligibility rate of 53 percent. Using a place-based eligibility criterion alone results in 57 percent of children being eligible using rule A and falls to 25 percent when the more restrictive criterion under rule D is used. If we combine person- and place-based eligibility, then everyone in the lowest two income groups would be eligible (either by residence or family income) and those in the highest income group would be eligible only if they reside in a geographically targeted area. The combination of person- and place-based eligibility increases the overall eligibility rate to 73 percent under rule A and 58 percent for rule B. In other words, if all children in ZIP Codes with 80 percent or more FRPM eligibility are eligible for subsidies (rule D), about 5 percent of the population of preschool-age children would not be income eligible but will reside in those areas of concentrated poverty and therefore be eligible for

Figure 4.2
Percentage of Preschool-Age Children in California Estimated to Be Eligible for ECE Subsidies Under Income or Location Targeting Rules or Both



SOURCE: Author's analysis based on 2007 CDE data on FRPM eligibility rates by school and RAND California Preschool Study household survey data. See Table A.1 in the appendix.

NOTE: Place-based or location targeting rule is based on percentage of elementary-school students in child's ZIP Code who are eligible for FRPMs. Person-based or income targeting rule is based on eligibility for full or partial ECE subsidies.

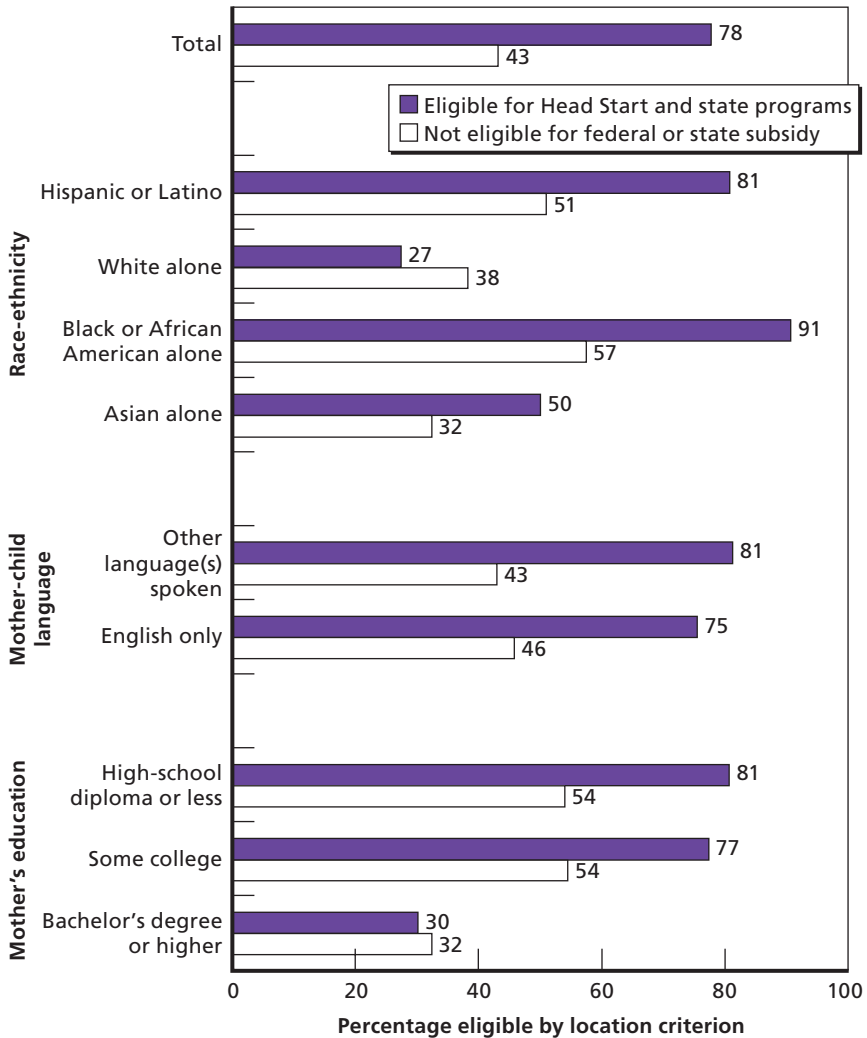
RAND MG889-4.2

subsidies (the difference between the 53-percent income-based eligibility rate and the 58-percent combined eligibility rate). Under the rule D place-based rule, about 40 percent of the eligible population would be eligible based on place-based eligibility (25 out of 58 percent), whereas eligibility is person based for the remaining 60 percent. The share of total eligibility that is determined using the place-based criterion is higher under rule A (57 out of 73 percent, or about 80 percent of the whole) with its higher overall eligibility rate.

This exercise can also be used to assess the efficiency of geographically based targeting for different population subgroups as shown in Figure 4.3. Here, we use place-based eligibility rule A to determine the fraction of children eligible using the place-based criterion by income eligibility group within groups defined by race-ethnicity, mother-child language, or mother's education. Thus, we can see what fraction of income-eligible Latinos, whites, or African Americans would also be

Figure 4.3

Percentage of Preschool-Age Children in California Estimated to Be Eligible for ECE Subsidies Under Place-Based Targeting Rule A, by Income-Eligibility Status and Selected Child and Family Characteristics



SOURCE: Author's analysis based on 2007 CDE data on FRPM eligibility rates by school and RAND California Preschool Study household survey data. See Table A.2 in the appendix.

NOTE: Place-based or location targeting rule is based on 50 percent or more of elementary-school students in child's ZIP Code who are eligible for FRPMs (rule A).

determined to be eligible using place-based rule A and what fraction of those not income eligible would be eligible based on residence.

This analysis shows that geographic targeting under rule A, especially for children below poverty (the lowest income group), is most effective for African Americans, among whom about 90 percent of children in the lowest income group are eligible under rule A. At the same time, 57 percent of African Americans who are not income eligible would be place-based eligible, the highest rate in Figure 4.3. The overlap in person- and place-based eligibility is lowest for whites, among whom just 27 percent of those in the lowest income group and 38 percent of those in the highest income group would be place-based eligible. These patterns reflect differences in the degree of residential segregation by neighborhood poverty levels as measured by the ZIP Code–level FRPM eligibility rate.

Although Figures 4.1 through 4.3 use one measure of place-based eligibility, there are many other measures that could be used as alternatives, such as the percentage of children in the community in low-performing schools or the percentage of at-risk children in the community defined by, for example, some other criteria, such as ELL status.¹² The appendix shows that the pattern of results is very similar when the former measure is used. Although the exact percentages differ, a similar pattern is evident of a trade-off between capturing a larger share of low-income children using a place-based eligibility rule and capturing a larger share of those not income eligible in the same communities. The targeting efficiency of a place-based criterion is also greater for subgroups of children who are more residentially segregated based on the characteristic used to determine place-based eligibility. This exercise also illustrates why the combination of place- and person-based eligibility is more effective when the government budget will support a higher overall eligibility rate. As the desired eligibility rate approaches

¹² When originally funded in 2006, PKFL (now combined under AB 2759 with other Title 5 child development programs as part of the new California State Preschool program) located programs in attendance areas of low-performing elementary schools (specifically those with API scores in the 1 to 3 range). Likewise, Los Angeles Universal Preschool (LAUP) has expanded preschool programs in hot zones, areas facing a shortfall in preschool spaces and with low-API elementary schools (Karoly, Reardon, and Cho, 2007a).

100 percent (i.e., universal coverage), a greater share of the overall eligibility rate can come through place-based eligibility.

Quality: Focus on What Matters

In terms of recommendations regarding quality, we start from the premise that quality is multidimensional, where both structural and process components are important. At the same time, the biggest shortfalls in ECE quality in California, according to our data, are in the process components, so that is the area that needs greatest attention. Moreover, as indicated by the work of Zellman et al. (2008), it is not sufficient to just measure and rate quality; it is also important to see whether the dimensions of quality rated and measured correlate with the ultimate goal of improved child development outcomes.

Recommendation: Use a multipronged strategy—with an emphasis on measurement and monitoring, financial incentives and supports, and accountability—to promote higher-quality preschool experiences in subsidized programs. The ultimate objective in promoting higher-quality preschool programs is to achieve the types of child development benefits demonstrated for effective programs. The examination of multiple quality dimensions by Karoly, Ghosh-Dastidar, et al. (2008a), combined with what we know about the relationship between various quality dimensions and child development outcomes, suggests that quality enhancements need to focus on such aspects as instructional support for learning, where quality is currently relatively low and where there is a strong linkage to promoting higher levels of school readiness. At the same time, quality enhancements cannot simply be regulated but require a multipronged approach that incorporates expectations and standards, measurement and monitoring, financial incentives and supports, and accountability. Thus, in addition to new resources, promoting quality is expected to involve the following:¹³

¹³ See National Early Childhood Accountability Task Force (2007) for additional detail regarding implementation of most of these approaches to quality improvement. Nackman and Eiler-White (2007) provide estimates of the one-time and ongoing costs associated with different options for measuring and monitoring quality.

- an approach for measuring structural and process quality using an effective QRIS with results that are publicly disseminated
- tools for valid and reliable assessment of child development outcomes to monitor progress at the child level and provide information at the program level for continuous quality improvement
- financial incentives to increase quality through a tiered reimbursement system tied to the QRIS
- technical assistance and other financial supports for programs to plan for, invest in, and achieve higher quality
- ongoing professional development, supervision, and coaching for classroom teachers
- a workforce development system, including financial supports, to train new ECE workforce entrants to deliver high-quality early education and to upgrade the skills of the existing workforce
- periodic, rigorous multiprogram evaluations to assess the effectiveness of the resources spent in terms of promoting child development and to provide information to support quality improvements.

Several of the recommendations for the shorter-term horizon involve investments in knowledge and practice to support larger-scale initiatives with new resources. Thus, the efforts to develop and pilot a QRIS and tiered reimbursement system will form the basis for future policymaking regarding those two approaches. Likewise, an assessment of the adequacy and efficiency of the ECE workforce development system will inform the changes needed to support a high-quality preschool system. Even with these initiatives, further piloting may be required, along with gradual phase-in of new measurements, financial incentives, and supports.

In promoting quality, just as in other aspects of the preschool system, it is important that efforts are standardized across different preschool programs and funding streams and across different types of providers. For example, preschool standards should be consistent across federal, state, and local programs, although other programs may want to adopt more-stringent standards. A common QRIS would apply to all subsidized child care and development programs serving children

from birth to age 12 and the same for the tiered reimbursement system. Moreover, although we have assumed that the focus is on raising quality for programs receiving public subsidies, many of these elements could be applied to the entire preschool delivery system—both subsidized and unsubsidized—such as the program standards, QRIS, workforce development system, and program evaluations.

Infrastructure: Address Supports Needed to Achieve Higher Quality and Expanded Access

Recommendation: Address workforce, facility, and other infrastructure supports needed to provide high-quality preschool for children currently eligible and those who will be eligible under any future expansion of eligibility. Efforts to raise preschool quality and expand access will require additional investments in the needed infrastructure supports listed in Table 3.3 in Chapter Three. Several of the recommendations provided earlier in this chapter proposed investigating changes to key infrastructure elements, such as the governance structure, data systems, and workforce development system, and implementing those that do not require a significant commitment of new resources. While some infrastructure improvements can be made with modest increases in resources, new resources will be needed to accompany the expanded funding required to raise preschool quality and expand access. For example, the recommended analysis of the adequacy and efficiency of the workforce development system will likely identify new resources needed to support training and ongoing professional development of the ECE workforce. Other studies have identified the current shortage of preschool facilities even without expanded eligibility, especially in communities where disadvantaged children reside (Munger et al., 2007). Thus, further investments in preschool facilities that will support high-quality programs, potentially through bond financing, would be a necessary complement to new resources devoted to enhancing quality or expanding access.¹⁴

¹⁴ See Sussman and Gillman (2007) for a more detailed discussion of how to expand high-quality preschool facilities.

Conclusions

The goal of the California Preschool Study has been to assess the adequacy and efficiency of preschool education in California and to identify strategies, using existing or new resources, to remedy shortfalls on either dimension. In this concluding chapter, we summarize the issues, options, and recommendations discussed in earlier chapters and draw out the broader implications of the policy recommendations.

California Faces Shortfalls in Preschool Adequacy and Efficiency

The cumulative body of evidence from the series of studies conducted as part of our investigation of preschool adequacy and efficiency and summarized in Chapter Two has identified a number of shortcomings on both fronts. In terms of adequacy, the research findings demonstrate the following:

- There are sizable deficits in student achievement by second and third grades, with even larger gaps for socioeconomically disadvantaged groups of children.
- The pattern of gaps in achievement manifested in the early elementary grades is also evident in gaps in school-readiness measures when children first enter kindergarten.
- The children who could benefit the most from a high-quality early-learning experience are the least likely to attend preschool of

any quality, and the same is true for participation in high-quality programs.

- Quality shortfalls in preschool programs are most evident for those measures strongly linked with promoting school readiness, such as providing developmentally appropriate learning supports.
- A rigorous research base shows that disadvantaged children can experience sizable benefits in both the shorter and longer terms from a high-quality preschool experience, yet California's system of publicly funded ECE programs targeted to lower-income children is underfunded and therefore able to serve only about half of the eligible three- and four-year-olds.

In terms of efficiency, our findings indicate the following:

- The minimal regulation of some publicly subsidized providers and the weak standards on key program elements for the more highly regulated Title 5 programs do not ensure high-quality services in publicly funded programs. Moreover, providers have no financial incentive, given the current reimbursement structure, to achieve higher quality. Thus, there is little assurance that the dollars spent on publicly subsidized preschool programs are supporting the maximum child development benefits.
- Current mechanisms for allocating funding to providers, whether through contracts, grants, or vouchers, make it difficult to spend all funding allocated for a given program year, thereby further diminishing the share of eligible children served.
- The complexity of the current system of publicly subsidized ECE programs makes it costly for providers to administer, challenging for families to navigate, and difficult for policymakers and the public to understand, evaluate, and improve.

Our analysis of the data assembled on achievement gaps, rates of preschool participation, and the effectiveness of well-designed preschool programs shows that preschool can be part of the solution for raising achievement overall and narrowing achievement gaps between

groups of students. However, different policy approaches have different implications for achievement gaps.

- If the goal is to raise student achievement in absolute terms for Latinos and African Americans, without reference to test scores of white students, then the largest *absolute* gain in test scores for Latinos and African Americans is associated with raising preschool participation and preschool quality for all groups of children—a universal approach. The estimated gain ranges from one-fifth to one-third of the size of the existing white-minority score gaps, depending on assumptions.
- The universal approach would also increase test scores for white children. So, if the goal is to narrow the score gap between Latinos and whites or African Americans and whites, the largest *relative* gain in student achievement is associated with targeted increases in preschool participation and quality for socioeconomically disadvantaged children, a larger proportion of whom are Latino or African American. With this targeted policy approach, the estimates suggest that the racial-ethnic achievement-score gap could be narrowed by about 10 to 20 percent, depending on assumptions.

At the same time, our analysis indicates that there would be almost no narrowing of absolute or relative achievement gaps from just raising preschool participation for all groups without any change in preschool quality. These results suggest that raising preschool quality is essential if preschool is to be an effective policy lever for addressing achievement gaps. In other words, a policy of targeted or broader-based quality improvements, combined with targeted increases in participation, would advance the adequacy of California's preschool system.

Policy Options and Recommendations for Advancing Preschool Adequacy and Efficiency

Considering various design options for a preschool program in terms of access, delivery, quality, and infrastructure, as well as research evidence regarding the effectiveness of alternative approaches, we provide a series of recommendations in support of the following policy goals for California:

- Increase access, especially for underserved groups.
- Raise quality, either for underserved groups or across the board, especially for those quality dimensions with the biggest shortfalls.
- Advance toward a more efficient and coordinated system.
- Provide appropriate infrastructure supports.

Some recommendations were viewed as appropriate in the short run under the expectation that significant new resources would not be available. For a medium-term horizon, in which more resources are devoted to preschool provision in California, we offer a series of recommendations on how best to use those new resources. Table 5.1 summarizes the list of recommendations, grouped (and numbered) within

Table 5.1
Summary of Policy Recommendations, by Domain

Domain	Recommendation	Description
Access	A1	Align the eligibility-determination process and allocation of children to slots with the policy objective of first serving children who can benefit most.
	A2 ^a	As access to preschool is extended, prioritize serving a larger share of currently eligible four-year-olds and three-year-olds in poverty.
	A3 ^a	As access to preschool is extended to a larger share of the population, consider combining geographic targeting with income targeting.

Table 5.1—Continued

Domain	Recommendation	Description
Delivery	D1	Modify the contract mechanism for Title 5 and AP programs to reduce the extent of unused funds and other inefficiencies.
	D2	Implement a common reimbursement structure within a system with mixed delivery and diverse funding streams.
Quality	Q1	Increase the routine licensing inspection rate for child-care centers and family child-care homes, and make inspection reports publicly available on the Internet.
	Q2	Develop and pilot a QRIS and tiered reimbursement system as part of the state's larger effort to create an Early Learning Quality Improvement System.
	Q3 ^a	Use a multipronged strategy—with an emphasis on measurement and monitoring, financial incentives and supports, and accountability—to promote higher-quality preschool experiences in subsidized programs.
Infrastructure	I1	Evaluate options for alternative governance structures in terms of the agencies that regulate and administer ECE programs, and change the structure if greater efficiency and effectiveness can be obtained.
	I2	Make greater use of the option to allocate Title I funds for preschool programs.
	I3	Fund the implementation of the preschool through higher education (P-16) longitudinal data system envisioned under recent legislation (California SB 1298).
	I4	Examine the adequacy and efficiency of the workforce development system for the ECE workforce, and make recommendations to align with future preschool policies.
	I5 ^a	Address workforce, facility, and other infrastructure supports needed to provide high-quality preschool for children currently eligible and those who will be eligible under any future expansion of eligibility.

SOURCE: Author's analysis.

^a Recommendation requires substantial new resources.

the access, delivery, quality, and infrastructure domains, where those that require substantial new resources are noted. (More-detailed suggestions regarding implementation of these recommendations were offered in Chapter Four.)

Improving the Efficiency of Existing Resources

The nine shorter-term recommendations in Table 5.1 are designed to use existing resources or modest resource increases (or reallocations, if efficiencies are achieved) to create a more efficient and coordinated preschool system with appropriate infrastructure supports. This would be accomplished by

- modifying the process of eligibility determination to ensure that children who can benefit most are served first and that there is stability in enrollment within a program year and across program years for those who start at age three (A1)
- reducing inefficiencies in contracting mechanisms by introducing greater flexibility in how funds are allocated and reallocated and possibly shifting from contracts that reimburse child-days served to grants with minimum enrollment or attendance requirements (D1)
- standardizing reimbursement structures across subsidized ECE programs for preschool-age children, retaining elements in some parts of the system, such as reimbursement rates that vary by geography (D2)
- building a foundation for future quality improvements through an increase in routine licensing inspections that produce readily accessible, published reports (Q1) and through the development and testing of a QRIS and tiered reimbursement system (Q2)
- promoting more-effective infrastructure support by assessing options for alternative governance structures (I1), increasing the use of Title I funds for preschool (I2), funding the development and use of P–16 longitudinal data systems (I3), and assessing ways to advance the structure of the workforce development system (I4).

To the extent that there is a need to prioritize these initiatives or consider which are complementary, we would recommend an initial focus on developing a more rational eligibility determination process (A1), reducing inefficiencies in contracting mechanisms (D1), and increasing routine inspections (Q1). In each of these cases, it may be productive to begin with pilot programs in one or more counties to evaluate alternative approaches before implementing changes statewide. In addition, the first steps for some of the other recommendations will be taken through initiatives just getting under way, such as the design of an early-learning quality improvement system (Q2) under SB 1629 and the development of a P-16 data system (I3) under SB 1298. Developing a standardized reimbursement structure (D2) is complementary to the development of the quality improvement system (Q2), as the latter will likely include tiered reimbursement or other financial incentives to support quality improvements.

Investing New Resources to Expand Access or Raise Quality

The remaining longer-term recommendations are designed to make effective use of any new resources that are devoted to expanding preschool access and raising quality. Given the trade-offs inherent in universal versus targeted approaches, we have not made a recommendation for one approach or the other. We have, however, argued that, with only about 50 percent of currently eligible lower-income children being served by publicly subsidized programs, California could continue to expand enrollments under current eligibility rules or even expand eligibility criteria and still serve children who would be expected to generate a net positive benefit (i.e., benefits to government or society that exceed program costs). Thus, we recommend that new funds be used to do the following:

- Expand coverage to those who will benefit the most, which means that an initial priority would be to serve a larger share of currently eligible four-year-olds and three-year-olds with income below the federal poverty line (A2).
- Implement place-based targeting combined with person-based targeting as the size of the eligible population expands (A3).

- Promote quality improvements, especially for program features most important for child development, by implementing a multi-pronged approach that includes quality measurement and monitoring, financial incentives and supports, and accountability through evaluating child development outcomes (Q3).
- Address the infrastructure supports needed to achieve higher quality and expanded access, especially in such areas as workforce development and facilities (I5).

In terms of priorities, new resources should first be devoted to enhancing the quality of the subsidized programs that are currently serving children (Q3) before serving new children in programs with current levels of quality. The analysis in Chapter Two suggests that simply expanding access with no quality improvements would be unlikely to produce major advances toward narrowing achievement gaps. In addition, efforts to expand quality will be dependent on some of the accompanying infrastructure supports (I5), such as enhancing the education, training, and ongoing professional development of preschool program teachers and staff.

As noted earlier, with most of the policy changes listed in Table 5.1, a period of piloting and evaluation is appropriate. Given the variation across California counties that already exists in ECE implementation, such as with the PoP demonstration projects and associated Preschool for All initiatives under way in several counties, California has natural laboratories for testing and evaluating new approaches. If efforts are expanded to a larger scale, continued studies can assess whether the desired outcomes are attained or whether further refinements are needed.

The nine recommendations in Table 5.1 that do not require a significant infusion of new resources for implementation offer a strategic approach for California to institute incremental reforms to the current system of publicly funded ECE programs to deliver more services with the same resources or to lay a foundation for expanding access and raising quality in the future as new resources become available. Although California is unlikely to devote significant new resources for subsidized preschool programs in the near term, new resources will be coming

to the state through the 2009 ARRA. Some of those resources will be designated for specific purposes, such as increasing enrollments or enhancing data systems. The recommendation to devote more Title I funds to preschool education may also be possible with the new federal funding. Flexible funds under the ARRA could be used to provide a down payment on some of the initiatives recommended in Table 5.1 that require new resources, such as implementing a QRIS or investing in the education and training of the ECE workforce. Given the stated priorities of the Obama administration in the proposed FY 2010 budget, California may also benefit from additional federal investments in early-education services beyond those included in the ARRA.

Finally, it is worth noting that there is considerable overlap between the recommendations contained in Table 5.1 and the preschool recommendations offered by the Governor's Committee on Education Excellence and the P-16 Council summarized in Table 1.3 in Chapter One. Like the recommendations in Table 5.1, the overall objective of those in Table 1.3 is to increase access and raise quality. In contrast to both sets of recommendations in Table 1.3, Table 5.1 does not emphasize the establishment of developmentally appropriate preschool learning standards aligned with K-12 standards because CDE is midway through developing such learning standards. In contrast to the P-16 Council recommendations, we have not been specific about requirements for group sizes, teacher education, or program services, preferring instead to allow some flexibility in how quality would be measured in the QRIS that is developed based on research evidence of the factors associated with improving child development outcomes.

Broader Implications

Although our focus for purposes of this study has been on preschool programs serving children one or two years before kindergarten entry, it is important to consider the broader implications of reforms to California's preschool system in order to promote adequacy and efficiency. We highlight three issues here: the consequences for the system of subsidized child-care and early-education services provided from birth to

age 12, the potential synergies with reforms to the K–12 system, and the need to consider preschool initiatives within the broader continuum of services, starting with birth and continuing once children enter elementary school.

First, many of the programs and funding streams that support services for preschool-age children shown in Figure 1.1 in Chapter One also serve children younger than age 3 and older than age 4. In other words, the publicly subsidized preschool system is effectively embedded within a larger child-care and early-education system that serves children from birth to age 12 (see Karoly, Reardon, and Cho, 2007a, for additional detail). For the most part, within a given funding stream, such as the Title 5 child development program or the CalWORKs stages, the same eligibility rules, licensing and program standards (with some variation with the ages of children served), contracting mechanism, and reimbursement structure apply to programs whether they serve infants and toddlers, preschool-age children, or school-age children. In many cases, the same providers serve children in the entire age range. In addition, the entire 0–12 system falls under a common governance structure.

Thus, to maintain uniformity within the 0–12 system, changes to the preschool part of the system may imply the need for comparable changes to the parts of the program that serve younger and older children. In many cases, the types of recommended reforms (e.g., a more flexible contracting mechanism, a common reimbursement system, or a QRIS) could be beneficial for and replicated for the entire system, albeit with some differences to reflect the ages of the children served. In other cases, such as expanding access, the reforms may be possible only for the preschool component of the system, depending on available funds.

Second, many of the recommendations regarding reforms to the preschool system or the *P* in P–16 are similar to those recommended for the K–12 education system in the *Getting Down to Facts* effort (Loeb, Bryk, and Hanushek, 2007), as well as by the Governor’s Committee on Education Excellence (2007a, 2007b) and the P–16 Council (2008). Although the systems are very different and specific solutions may vary with respect to the *P* component versus the K–12 component, some

general strategies in terms of governance, financing, ELLs, workforce development, facilities, and so on may benefit from addressing these issues in a coordinated fashion and considering the transferability of effective practices from the K–12 arena to the P domain and vice versa. At the very least, reforms being considered for the K–12 system must account for the possible impact on the preschool system and the reverse as well. Ultimately, on all fronts, California needs to create a P–12 or P–16 system that is truly integrated and coordinated.

Third, our analysis in Chapter Two confirms that advancing preschool access and quality cannot be expected to close existing achievement gaps. In the effort to raise achievement for all students, but especially for more-disadvantaged students, consideration also needs to be given to programs serving children and families from birth to age three, as well as school-age services to support continued learning.¹ Other successful center-based program models with a rigorous evidence base include the Carolina Abecedarian Project, Infant Health and Development Program, and Syracuse Family Development Research Program, each of which provided full-time, year-round, center-based services starting soon after birth and continuing as long as until kindergarten entry. The Chicago CPC and Abecedarian programs provide examples of programs that continue supportive services into the early elementary grades and that have strengthened the ability to sustain the advantages conferred through preschool participation. Non-center-based early-intervention models like the Nurse-Family Partnership home-visiting program have also demonstrated short- and longer-term benefits. Given the existence of other proven models for promoting healthy child development before and after kindergarten entry, it is vital that preschool programs be considered as part of a continuum of services designed to prepare children for kindergarten and to ensure their success in school and beyond.

¹ See Karoly, Greenwood, et al. (1998) and Karoly, Kilburn, and Cannon (2005) for reviews of the broader array of early-intervention models with proven benefits, including the programs mentioned here.

Supplement to the Targeting Analysis in Chapter Four

This appendix provides additional detail and supplemental results for the targeting analysis presented in Chapter Four. Figures 4.1 through 4.3 in Chapter Four show results using alternative place-based targeting rules based on the percentage of elementary-school students eligible for FRPMs at the ZIP Code level (rules A to D). The ZIP Code–level measure of FRPM eligibility, aggregated from publicly available school-level data available through CDE, was matched to our California Preschool Study sample of 2,025 preschool-age children in California by ZIP Code. Table A.1 presents results that correspond to the results plotted in Figures 4.1 and 4.2 for the four targeting rules A through D, while Table A.2 includes the results shown in Figure 4.3 based on place-based targeting rule A. Note that the results by income group in Table A.1 are disaggregated for the middle income group in Figures 4.1 and 4.2 into two subgroups:

- those eligible for state programs only with a full subsidy (i.e., income above poverty but below the level at which family fees apply)
- those eligible for state programs only with a partial subsidy (i.e., income is in the range where family fees apply up to 75 percent of SMI).

In addition, we conducted the targeting analysis using a measure of the API status for elementary schools in the ZIP Code as an alternative place-based targeting measuring. In particular, we calculated on the share of kindergarten students in the child’s ZIP Code in a school

with API between 1 and 3.¹ Table A.3 shows equivalent results for four targeting rules (rules E to H) based on the percentage of children in the ZIP Code in API 1–3 schools. For example, as seen in Table A.3, if eligibility is conferred upon those children in ZIP Codes in which 10 percent or more of children are in low-performing schools (eligibility rule E), about 53 percent of children would be eligible, close to the same eligibility rate as when eligibility is based on income using the thresholds under rule A. However, when we break down the eligibility rate under rule E for the four income eligibility groups, we see that just 75 percent of the children in poverty reside in the geographically targeted areas. That rate falls to 68 percent of the second-highest income group (i.e., the state-programs-only, full-subsidy group) and 53 percent of the third-highest group (i.e., the partial-subsidy group). Moreover, another 41 percent of those who are not income eligible reside in the targeted communities. Thus, targeting under rule E misses between 25 and 50 percent of children who would otherwise be income eligible and potentially serves more than 40 percent of those who are not income eligible. If we combine person- and place-based eligibility, the total eligibility rate increases to 72 percent, where the extra 20 percentage points in the overall eligibility rate comes from making the program available to nearly half of those with higher income (a group that is just under half of the total population).

Table A.3 shows these same outcomes under rules F through H, under which we increase the concentration of children in low-performing schools from 10 percent to 30, 50, and 70 percent, respectively. Since fewer children live in areas with higher concentra-

¹ Low-performing schools in California are often identified as those with an API statewide rank of 1 to 3. For example, PKFL specified that programs had to be located in the attendance area of elementary schools with API ranks in the first three deciles. As with FRPM eligibility, we were not able to match the child sample to the API rank for the elementary-school catchment area in which they reside, so we used a summary measure of the API rank for all elementary schools in the ZIP Code. The ZIP Code-level measure was weighted by the number of kindergarten students in each elementary school. The school-based data come from aggregating, by ZIP Code, three school-level data sources available from CDE: the Public Schools Database (for school ZIP Codes), the CBEDS school-information form (for school enrollment data by grade), and the API data files (for the schools' 2007 base API statewide rank).

tions of children in low-performing schools and the children in those communities are more likely to have lower incomes, rules E to H successively result in fewer place-based eligible children but also fewer eligible children in the highest income group (as low as 7 percent under rule H, compared with 41 percent under rule E). The combined eligibility rate using both place- and person-based eligibility under rule H is 56 percent, just a few percentage points above the rate when only the person-based measure of family income is used for targeting. Under rule H, about 35 percent of the eligible population (19.7 divided by 56.0) is determined by place-based eligibility.

The efficiency of geographically based targeting for different population subgroups using the API status measure is shown in Table A.4 using rule E. For ease in presentation, we have collapsed the second- and third-highest income groups, for which we present the results from rule E for income eligibility groups with the two middle income groups combined. As with the results in Figure 4.3 based on FRPM status, the patterns reflect differences in the degree of residential segregation by school performance. Again, geographic targeting is most effective for African Americans. It is least effective for Asians.

Table A.1
Eligibility Rates for Preschool-Age Children in California for ECE Subsidies Under Alternative Place-Based Targeting Rules Using Percentage of Elementary-School Students in Child's ZIP Code Who Are Eligible for FRPMs, by Income Eligibility Status

	Rule A Eligibility		Rule B Eligibility		Rule C Eligibility		Rule D Eligibility	
	By Location	Added, by Income	By Location	Added, by Income	By Location	Added, by Income	By Location	Added, by Income
Eligibility for ECE subsidies								
Head Start and state programs	77.6	22.4	72.4	27.6	64.7	35.3	56.6	43.4
State programs only, full subsidy	60.9	39.1	48.7	51.3	36.4	63.6	31.5	68.5
State programs only, partial subsidy	67.9	32.1	54.7	45.3	41.4	58.6	25.1	74.9
Not eligible for federal or state subsidy	43.2	0.0	32.9	0.0	19.1	0.0	10.7	0.0
Total eligibility rate								
Location criterion only		57.4		47.3		35.0		25.1
Income criterion only		52.9		52.9		52.9		52.9
Location and income		73.2		68.4		61.9		57.9

SOURCE: Author's analysis of 2007 CDE data on FRPM eligibility rates by school and RAND California Preschool Study household survey data. Rules determine threshold percentage above which elementary-school students in a ZIP Code are eligible for FRPMs: rule A = 50 percent or more, rule B = 60 percent or more, rule C = 70 percent or more, and rule D = 80 percent or more.

Table A.2

Eligibility Rates for Preschool-Age Children in California for ECE Subsidies Under Place-Based Eligibility Rule A Using School-Level FRPM Status, by Income Eligibility Status and Selected Child and Family Characteristics

Characteristic	Eligibility by Location	Added Eligibility by Income
Income eligibility for ECE subsidies		
Head Start and state programs	77.6	22.4
State programs only, full or partial subsidy	63.3	36.7
Not eligible for federal or state subsidy	56.8	0.0
Race-ethnicity		
Hispanic or Latino		
Income eligibility: Head Start and state programs	80.7	19.3
Income eligibility: state programs only, full or partial subsidy	70.5	29.5
Income eligibility: not eligible for federal or state subsidy	50.8	0.0
White alone		
Income eligibility: Head Start and state programs	27.3	72.7
Income eligibility: state programs only, full or partial subsidy	51.0	49.0
Income eligibility: not eligible for federal or state subsidy	38.1	0.0
Black or African American alone		
Income eligibility: Head Start and state programs	90.5	9.5
Income eligibility: state programs only, full or partial subsidy	63.5	36.5
Income eligibility: not eligible for federal or state subsidy	57.3	0.0
Asian alone		
Income eligibility: Head Start and state programs	49.9	50.1
Income eligibility: state programs only, full or partial subsidy	47.8	52.2

Table A.2—Continued

Characteristic	Eligibility by Location	Added Eligibility by Income
Income eligibility: not elig. for federal or state subsidy	32.2	0.0
Language spoken between mother and child		
Language other than English spoken		
Income eligibility: Head Start and state programs	81.1	18.9
Income eligibility: state programs only, full or partial subsidy	60.6	39.4
Income eligibility: not elig. for federal or state subsidy	42.8	0.0
English only		
Income eligibility: Head Start and state programs	75.3	24.7
Income eligibility: state programs only, full or partial subsidy	71.8	28.2
Income eligibility: not elig. for federal or state subsidy	45.6	0.0
Highest education of mother		
High-school diploma or less		
Income eligibility: Head Start and state programs	80.5	19.5
Income eligibility: state programs only, full or partial subsidy	66.5	33.5
Income eligibility: not eligible for federal or state subsidy	53.8	0.0
Some college		
Income eligibility: Head Start and state programs	77.2	22.8
Income eligibility: state programs only, full or partial subsidy	68.2	31.8
Income eligibility: not eligible for federal or state subsidy	54.3	0.0
Bachelor's degree or higher		
Income eligibility: Head Start and state programs	30.0	70.0

Table A.2—Continued

Characteristic	Eligibility by Location	Added Eligibility by Income
Income eligibility: state programs only, full or partial subsidy	50.4	49.6
Income eligibility: not eligible for federal or state subsidy	32.2	0.0

SOURCE: Author’s analysis of 2007 CDE data on FRPM eligibility rates by school and RAND California Preschool Study household survey data.

NOTE: Eligibility rule for location targeting is 50 percent or more of elementary-school students in ZIP Code are eligible for FRPMs.

Table A.3
Eligibility Rate for Preschool-Age Children in California for ECE Subsidies Under Alternative Place-Based Targeting Rules Using Percentage of Kindergarten Students in Child's ZIP Code in Schools with API Scores of 1 to 3, by Income Eligibility Status

	Rule E Eligibility		Rule F Eligibility		Rule G Eligibility		Rule H Eligibility	
	By Location	Added, by Income	By Location	Added, by Income	By Location	Added, by Income	By Location	Added, by Income
Eligibility for ECE subsidies								
Head Start and state programs	75.0	25.0	68.5	31.5	63.9	36.1	42.9	57.1
State programs only, full subsidy	67.9	32.1	49.2	50.8	40.2	59.8	26.5	73.5
State programs only, partial subsidy	52.9	47.1	48.9	51.1	35.6	64.4	23.7	76.3
Not eligible for federal or state subsidy	40.8	0.0	30.1	0.0	13.5	0.0	6.7	0.0
Total eligibility rate								
Location criterion only	53.1		43.9		31.3		19.7	
Income criterion only	52.9		52.9		52.9		52.9	
Location and income	72.1		67.1		59.3		56.0	

SOURCE: Author's analysis of 2007 CDE data on API scores by school and RAND California Preschool Study household survey data.

NOTE: Rules determine threshold percentage above which kindergarten students in a ZIP Code are in API 1–3 schools: rule E = 10 percent or more, rule F = 30 percent or more, rule G = 50 percent or more, and rule H = 70 percent or more.

Table A.4
Eligibility Rates for Preschool-Age Children in California for ECE Subsidies
Under Place-Based Eligibility Rule E Using School-Level API Status, by
Income Eligibility Status and Selected Child and Family Characteristics

Characteristic	Eligibility by Location	Added Eligibility by Income
Income eligibility for ECE subsidies		
Head Start and state programs	75.0	25.0
State programs only, full or partial subsidy	57.5	42.5
Not eligible for federal or state subsidy	40.8	0.0
Race-ethnicity		
Hispanic or Latino		
Income eligibility: Head Start and state programs	76.9	23.1
Income eligibility: state programs only, full or partial subsidy	61.9	38.1
Income eligibility: not elig. for federal or state subsidy	48.9	0.0
White alone		
Income eligibility: Head Start and state programs	41.9	58.1
Income eligibility: state programs only, full or partial subsidy	37.7	62.3
Income eligibility: not elig. for federal or state subsidy	35.9	0.0
Black or African American alone		
Income eligibility: Head Start and state programs	89.9	10.1
Income eligibility: state programs only, full or partial subsidy	56.5	43.5
Income eligibility: not elig. for federal or state subsidy	56.5	0.0
Asian alone		
Income eligibility: Head Start and state programs	37.1	62.9
Income eligibility: state programs only, full or partial subsidy	56.9	43.1

Table A.4—Continued

Characteristic	Elibility by Location	Added Elibility by Income
Income eligibility: not elig. for federal or state subsidy	30.6	0.0
Mother-child language		
Language other than English spoken		
Income eligibility: Head Start and state programs	76.1	23.9
Income eligibility: state programs only, full or partial subsidy	51.6	48.4
Income eligibility: not elig. for federal or state subsidy	41.9	0.0
English only		
Income eligibility: Head Start and state programs	74.3	25.7
Income eligibility: state programs only, full or partial subsidy	64.4	35.6
Income eligibility: not elig. for federal or state subsidy	34.5	0.0
Highest education of mother		
High-school diploma or less		
Income eligibility: Head Start and state programs	77.7	22.3
Income eligibility: state programs only, full or partial subsidy	56.7	43.3
Income eligibility: not elig. for federal or state subsidy	55.8	0.0
Some college		
Income eligibility: Head Start and state programs	77.5	22.5
Income eligibility: state programs only, full or partial subsidy	57.4	42.6
Income eligibility: not elig. for federal or state subsidy	48.8	0.0
Bachelor's degree or higher		
Income eligibility: Head Start and state programs	41.3	58.7

Table A.4—Continued

Characteristic	Eligibility by Location	Added Eligibility by Income
Income eligibility: state programs only, full or partial subsidy	52.1	47.9
Income eligibility: not elig. for federal or state subsidy	30.4	0.0

SOURCE: Author's analysis of 2007 CDE data on API scores by school and RAND California Preschool Study household survey data.

NOTE: Eligibility rule for location targeting is 10 percent or more of kindergarten students in ZIP Code are in API 1–3 schools.

References

AB—*see* California Assembly Bill.

ACF—*see* Administration for Children and Families.

Administration for Children and Families, “Head Start Program Fact Sheet,” Washington, D.C.: U.S. Department of Health and Human Services, last updated June 18, 2008. As of January 15, 2009:
<http://www.acf.hhs.gov/programs/ohs/about/fy2008.html>

———, “National Accreditation Organizations for Early Childhood Programs,” last updated April 2009. As of January 15, 2009:
<http://www.nccic.org/poptopics/nationalaccred.html>

AIR—*see* American Institutes for Research.

American Institutes for Research, *Evaluation of Preschool for All Implementation in San Mateo and San Francisco Counties: Year 2 Report*, Palo Alto, Calif., October 29, 2007. As of April 29, 2009:
http://www.earlylearningsystems.org/files/PFA%20Year%202020Report_Final_11_09.pdf

Anderson, Laurie M., Carolynne Shinn, Mindy T. Fullilove, Susan C. Scrimshaw, Jonathan E. Fielding, Jacques Normand, and Vilma G. Carande-Kulis, “The Effectiveness of Early Childhood Development Programs: A Systematic Review,” *American Journal of Preventive Medicine*, Vol. 24, No. 3, 2003, pp. 32–46.

ARRA—*see* Public Law 111-5.

Ballantyne, Keira Gebbie, Alicia R. Sanderman, Timothy D’Emilio, and Nicole McLaughlin, *Dual Language Learners in the Early Years: Getting Ready to Succeed in School*, Washington, D.C.: National Clearinghouse for English Language Acquisition, 2008. As of April 28, 2009:
<http://ncela.edstudies.net/resabout/ecell/earlyyears.pdf>

Barnett, W. Steven, "Maximizing Returns from Prekindergarten Education," in Federal Reserve Bank of Cleveland, *Education and Economic Development: Federal Reserve Bank of Cleveland Research Conference—Proceedings of a Conference Held in Cleveland, Ohio, November 18–19, 2004*, Cleveland, Ohio, 2005, pp. 5–18. As of April 28, 2009:

<http://www.clevelandfed.org/research/conferences/2004/november/pdf/barnett.pdf>

———, *Preschool Education and Its Lasting Effects: Research and Policy Implications*, East Lansing, Mich.: Great Lakes Center for Education Research and Practice, September 2008. As of January 15, 2009:

<http://epicpolicy.org/publication/preschool-education>

Barnett, W. Steven, Kirsty Brown, and Rima Shore, "The Universal vs. Targeted Debate: Should the United States Have Preschool for All?" *Preschool Policy Matters*, Vol. 6, April 2004. As of January 15, 2009:

<http://nieer.org/resources/policybriefs/6.pdf>

Barnett, W. Steven, and Colette M. Escobar, "The Economics of Early Educational Intervention: A Review," *Review of Educational Research*, Vol. 57, No. 4, Winter 1987, pp. 387–414.

Barnett, W. Steven, and Ellen Frede, *Federal Early Childhood Policy Guide for the First 100 Days*, New Brunswick, N.J.: National Institute for Early Education Research, policy brief, January 8, 2009. As of April 29, 2009:

<http://nieer.org/docs/?DocID=250>

Barnett, W. Steven, Carollee Howes, and Kwanghee Jung, *California's State Preschool Program: Quality and Effects on Children's Cognitive Abilities at Kindergarten Entry*, report to the California Children and Families Commission, Sacramento, Calif.: First 5 California Children and Families Commission, forthcoming.

Barnett, W. Steven, Jason T. Hustedt, Laura E. Hawkinson, and Kenneth B. Robin, *The State of Preschool 2006: State Preschool Yearbook*, New Brunswick, N.J.: National Institute for Early Education Research, 2006. As of April 29, 2009:

<http://nieer.org/yearbook2006/>

Barnett, W. Steven, Jason T. Hustedt, Allison H. Friedman, Judi Stevenson Boyd, and Pat Ainsworth, *The State of Preschool: 2007 State Preschool Yearbook*, New Brunswick, N.J.: National Institute for Early Education Research, 2007. As of April 29, 2009:

<http://nieer.org/yearbook2007/>

Barnett, W. Steven, Kenneth B. Robin, Jason T. Hustedt, and Karen L. Schulman, *The State of Preschool: 2003 State Preschool Yearbook*, New Brunswick, N.J.: National Institute for Early Education Research, 2003. As of April 29, 2009:

<http://nieer.org/yearbook2003/>

Barnett, W. Steven, Donald J. Yarosz, Jessica Thomas, Kwanghee Jung, and Dulce Blanco, "Two-Way and Monolingual English Immersion in Preschool Education: An Experimental Comparison," *Early Childhood Research Quarterly*, Vol. 22, No. 3, 3rd Quarter 2007, pp. 277–293.

Belfield, Clive R., *The Fiscal Impacts of Universal Pre-K: Case Study Analysis for Three States*, Washington, D.C.: Committee for Economic Development, Invest in Kids working paper 6, March 2005.

California Assembly Bill 1326, an act to add and repeal Article 15.3 (commencing with Section 8340) of Chapter 2 of Part 6 of the Education Code, relating to child care, approved by the governor October 8, 2003. As of May 13, 2009:
http://www.co.sanmateo.ca.us/vgn/images/portal/cit_609/93109062ab_1326_bill_20031009_chaptered.pdf

California Assembly Bill 2759, an act relating to state preschool programs, February 22, 2008. As of May 12, 2009:
http://info.sen.ca.gov/pub/07-08/bill/asm/ab_2751-2800/ab_2759_bill_20080222_introduced.pdf

California Code of Regulations, Title 5, Education.

California Code of Regulations, Title 22, Social Security.

California Department of Education, "California State Preschool Program," Sacramento, Calif.: California Department of Education, management bulletin 08-13, November 2008. As of January 15, 2009:
<http://www.cde.ca.gov/sp/cd/ci/mb0813.asp>

California Legislature, Joint Committee to Develop a Master Plan for Education—Kindergarten Through University, *The California Master Plan for Education*, Sacramento, Calif.: Senate Publications, 2002.

California P–16 Council, *Closing the Achievement Gap: Report of Superintendent Jack O'Connell's California P–16 Council*, Sacramento, Calif.: California P–16 Council, January 2008. As of April 29, 2009:
<http://www.cde.ca.gov/eo/in/pc/documents/yr08ctagrpt0122.pdf>

California Senate Bill 1298, an act to add Chapter 8 (commencing with Section 10800) to Part 7 of Division 1 of Title 1 of the Education Code, relating to education, amended August 15, 2008. As of May 8, 2009:
http://www.leginfo.ca.gov/pub/07-08/bill/sen/sb_1251-1300/sb_1298_bill_20080815_amended_asm_v93.pdf

California Senate Bill 1629, an act relating to state preschool programs, February 22, 2008. As of May 12, 2009:
http://info.sen.ca.gov/pub/07-08/bill/sen/sb_1601-1650/sb_1629_bill_20080222_introduced.pdf

Camilli, Gregory, Sadako Vargas, Sharon Ryan, and W. Steven Barnett, "Meta-Analysis of the Effects of Early Education Interventions on Cognitive and Social Development," *Teachers College Record*, Vol. 112, No. 3, 2010. As of January 15, 2009:

<http://www.tcrecord.org/Content.asp?ContentID=15440>

Cannon, Jill S., and Lynn A. Karoly, *The Promise of Preschool for Narrowing Readiness and Achievement Gaps Among California Children*, Santa Monica, Calif.: RAND Corporation, RB-9306-PF/WKKF/PEW/NIEER/WCJVSF/LAUP, 2007a. As of April 29, 2009:

http://www.rand.org/pubs/research_briefs/RB9306/

———, *Who Is Ahead and Who Is Behind? Gaps in School Readiness and Student Achievement in the Early Grades for California's Children*, Santa Monica, Calif.: RAND Corporation, TR-537-PF/WKKF/PEW/NIEER/WCJVSF/LAUP, 2007b. As of April 29, 2009:

http://www.rand.org/pubs/technical_reports/TR537/

CDE—see California Department of Education.

Center for Law and Social Policy, "What Are the Benefits and Challenges of the Emerging Models for Governance of Early Care and Education Services/Systems in the States?" governance research brief from the Alliance for Early Childhood Finance National Conference Call, January 25, 2007. As of May 22, 2009:

<http://www.earlychildhoodfinance.org/Meetings&Calls/ConfCall%2012507/ConferenceCallGovernanceResourceBrief.doc>

Center for the Study of Child Care Employment, *Early Childhood Educator Competencies: A Literature Review of Current Best Practices, and a Public Input Process on Next Steps for California*, Berkeley, Calif.: Center for the Study of Child Care Employment and Institute for Research on Labor and Employment, 2008. As of April 29, 2009:

http://www.irle.berkeley.edu/cscce/pdf/competencies_report08.pdf

Clifford, Richard M., Oscar Barbarin, Florence Chang, Diane Early, Donna Bryant, Carollee Howes, Margaret Burchinal, and Robert Pianta, "What Is Pre-Kindergarten? Characteristics of Public Pre-Kindergarten Programs," *Applied Developmental Science*, Vol. 9, No. 3, 2005, pp. 126–143. As of April 29, 2009:

<http://www.fpg.unc.edu/%7Encedl/pdfs/ADS0903pp126-143.pdf>

Crane, Jonathan, *Social Programs That Work*, New York, N.Y.: Russell Sage Foundation, 1998.

Duncan, Greg J., and Christina M. Gibson-Davis, "Connecting Child Care Quality to Child Outcomes: Drawing Policy Lessons from Nonexperimental Data," *Evaluation Review*, Vol. 30, No. 5, 2006, pp. 611–630.

Ewen, Danielle, and Hannah Matthews, *Title I and Early Childhood Programs: A Look at Investments in the NCLB Era*, Washington, D.C.: Center for Law and Social Policy, policy paper 2, October 2007. As of April 29, 2009: http://www.clasp.org/publications/ccee_paper2.pdf

Florida Department of Education, "PK–20 Education Data Warehouse," Tallahassee, Fla.: Florida Department of Education, undated. As of January 15, 2009: <http://edwapp.doe.state.fl.us/>

Fryer, Ronald G. Jr., and Steven D. Levitt, "Understanding the Black-White Test Score Gap in the First Two Years of School," *Review of Economics and Statistics*, Vol. 86, No. 2, 2004, pp. 447–464.

———, "The Black-White Test Score Gap Through Third Grade," Cambridge, Mass.: National Bureau of Economic Research, working paper 11049, January 2005. As of April 29, 2009: <http://www.nber.org/papers/w11049>

Fuller, Bruce, Margaret Bridges, and Seeta Pai, *Standardized Childhood: The Political and Cultural Struggle over Early Education*, Stanford, Calif.: Stanford University Press, 2007.

Fuller, Bruce, and Joseph Wright, *Parallel Play: Preschool and K–12 Finance Reform in New Jersey and Texas*, Berkeley, Calif.: Policy Analysis for California Education working paper 07-03, July 2007. As of April 29, 2009: <http://pace.berkeley.edu/2007/07/01/parallel-play-preschool-and-k-12-finance-reform-in-new-jersey-and-texas-working-paper-07-3/>

Gerber, Emily B., Marcy Whitebook, and Rhona S. Weinstein, "At the Heart of Child Care: Predictors of Teacher Sensitivity in Center-Based Child Care," *Early Childhood Research Quarterly*, Vol. 22, No. 3, 2007, pp. 327–346.

Gormley, William T. Jr., "Early Childhood Care and Education: Lessons and Puzzles," *Journal of Policy Analysis and Management*, Vol. 26, No. 3, Summer 2007, pp. 633–671.

———, "The Effects of Oklahoma's Pre-K Program on Hispanic Children," *Social Sciences Quarterly*, Vol. 89, No. 4, December 2008, pp. 916–936.

Gormley, William T. Jr., Ted Gayer, Deborah Phillips, and Brittany Dawson, "The Effects of Universal Pre-K on Cognitive Development," *Developmental Psychology*, Vol. 41, No. 6, 2005, pp. 872–884.

Governor's Committee on Education Excellence, *Students First: Renewing Hope for California's Future*, Sacramento, Calif., November 2007a. As of April 29, 2009: <http://www.everychildprepared.org/docs/summary.pdf>

———, *Students First: Renewing Hope for California's Future*, Technical Report, Sacramento, Calif., November 2007b. As of April 29, 2009:
<http://www.everychildprepared.org/techreports.php>

Hamre, Bridget K., and Robert C. Pianta, "Can Instructional and Emotional Support in the First-Grade Classroom Make a Difference for Children at Risk of School Failure?" *Child Development*, Vol. 76, No. 5, 2005, pp. 949–967.

Hansen, Janet S., *Education Data in California: Availability and Transparency*, paper prepared for Getting Down to Facts: A Research Project Examining California's School Governance and Finance Systems, Palo Alto, Calif.: Institute for Research on Education Policy and Practice, Stanford University, November 2006. As of February 1, 2009:
[http://irepp.stanford.edu/documents/GDF/STUDIES/15-Hansen/15-Hansen\(3-07\).pdf](http://irepp.stanford.edu/documents/GDF/STUDIES/15-Hansen/15-Hansen(3-07).pdf)

Henry, Gary T., and Dana K. Rickman, "Do Peers Influence Children's Skill Development in Preschool?" *Economics of Education Review*, Vol. 26, No. 1, February 2007, pp. 100–112.

Howes, Carollee, Margaret Burchinal, Robert Pianta, Donna Bryant, Diana Early, Richard Clifford, and Oscar Barbarin, "Ready to Learn? Children's Pre-Academic Achievement in Pre-Kindergarten Programs," *Early Childhood Research Quarterly*, Vol. 23, No. 1, 1st Quarter 2008, pp. 27–50.

Hustedt, Jason T., W. Steven Barnett, and Kwanghee Jung, *The Effects of the New Mexico PreK Initiative on Young Children's School Readiness*, New Brunswick, N.J.: National Institute for Early Education Research, 2007. As of April 29, 2009:
<http://nieer.org/docs/?DocID=183>

Hustedt, Jason T., W. Steven Barnett, Kwanghee Jung, and Alexandra Figueras, *Impacts of New Mexico PreK on Children's School Readiness at Kindergarten Entry: Results from the Second Year of a Growing Initiative*, New Brunswick, N.J.: National Institute for Early Education Research, June 2008. As of April 29, 2009:
<http://nieer.org/docs/?DocID=202>

Hustedt, Jason T., W. Steven Barnett, Kwanghee Jung, and Jessica Thomas, *The Effects of the Arkansas Better Chance Program on Young Children's School Readiness*, New Brunswick, N.J.: National Institute for Early Education Research, January 2007. As of April 29, 2009:
<http://nieer.org/docs/?DocID=158>

Kagan, Sharon Lynn, "Closing the Achievement Gap: The Potential of High Quality Early Childhood Education," presentation given at the California Achievement Gap Summit, Sacramento, Calif., November 2007.

Karoly, Lynn A., and James H. Bigelow, *The Economics of Investing in Universal Preschool Education in California*, Santa Monica, Calif.: RAND Corporation, MG-349-PF, 2005. As of April 29, 2009:
<http://www.rand.org/pubs/monographs/MG349/>

Karoly, Lynn A., Bonnie Ghosh-Dastidar, Gail L. Zellman, Michal Perlman, and Lynda Fernyhough, *Prepared to Learn: The Nature and Quality of Early Care and Education for Preschool-Age Children in California*, Santa Monica, Calif.: RAND Corporation, TR-539-PF/WKKF/PEW/NIEER/WCJVSF/LAUP, 2008a. As of April 29, 2009:

http://www.rand.org/pubs/technical_reports/TR539/

———, *Room for Improvement in the Use of High-Quality Preschool Programs for California's Children*, Santa Monica, Calif.: RAND Corporation, RB-9358-PF/WKKF/PEW/NIEER/WCJVSF/LAUP, 2008b. As of April 29, 2009:

http://www.rand.org/pubs/research_briefs/RB9358/

Karoly, Lynn A., Peter W. Greenwood, Susan S. Everingham, Jill Houbé, M. Rebecca Kilburn, C. Peter Rydell, Matthew Sanders, and James Chiesa, *Investing in Our Children: What We Know and Don't Know About the Costs and Benefits of Early Childhood Interventions*, Santa Monica, Calif.: RAND Corporation, MR-898-TCWF, 1998. As of April 29, 2009:

http://www.rand.org/pubs/monograph_reports/MR898/

Karoly, Lynn A., M. Rebecca Kilburn, and Jill S. Cannon, *Early Childhood Interventions: Proven Results, Future Promise*, Santa Monica, Calif.: RAND Corporation, MG-341-PNC, 2005. As of April 29, 2009:

<http://www.rand.org/pubs/monographs/MG341/>

Karoly, Lynn A., Elaine Reardon, and Michelle Cho, *Early Care and Education in the Golden State: Publicly Funded Programs Serving California's Preschool-Age Children*, Santa Monica, Calif.: RAND Corporation, TR-538-PF/WKKF/PEW/NIEER/WCJVSF/LAUP, 2007a. As of April 29, 2009:

http://www.rand.org/pubs/technical_reports/TR538/

———, *Publicly Funded Early Care and Education Programs for California Preschool-Age Children*, Santa Monica, Calif.: RAND Corporation, RB-9307-PF/WKKF/PEW/NIEER/WCJVSF/LAUP, 2007b. As of April 29, 2009:

http://www.rand.org/pubs/research_briefs/RB9307/

Kilburn, M. Rebecca, and Lynn A. Karoly, *The Economics of Early Childhood Policy: What the Dismal Science Has to Say About Investing in Children*, Santa Monica, Calif.: RAND Corporation, OP-227-CFP, 2008. As of April 29, 2009:

http://www.rand.org/pubs/occasional_papers/OP227/

Kirp, David L., *The Sandbox Investment: The Preschool Movement and Kids-First Politics*, Cambridge, Mass.: Harvard University Press, 2007.

LAO—see Legislative Analyst's Office.

Legislative Analyst's Office, *Analysis of the 2006–07 Budget Bill: Licensing and Certification Reform Proposals*, Sacramento, Calif., February 2006. As of February 1, 2009:

http://www.lao.ca.gov/analysis_2006/health_ss/hss_03_anl06.html

———, *Analysis of the 2008–09 Budget Bill*, Sacramento, Calif., February 2008a. As of February 1, 2009:

<http://www.lao.ca.gov/laoapp/Analysis.aspx?year=2008&chap=0&toc=0>

———, *LAO Recommended Legislation*, Sacramento, Calif., December 1, 2008b. As of February 1, 2009:

http://www.lao.ca.gov/2008/rec_legislation/rec_leg_120108.aspx

———, *Analysis of the 2009–10 Budget Bill: Social Services*, Sacramento, Calif., January 22, 2009. As of February 1, 2009:

<http://www.lao.ca.gov/laoapp/Analysis.aspx?Year=2009&toc=1&chap=11>

LeMoine, Sarah, *Workforce Designs: A Policy Blueprint for State Early Childhood Professional Development Systems*, Washington, D.C.: National Association for the Education of Young Children, 2008. As of April 29, 2009:

http://www.naeyc.org/policy/ecwsi/pdf/Workforce_Designs.pdf

Loeb, Susanna, Anthony Bryk, and Eric Hanushek, *Getting Down to Facts: School Finance and Governance in California—Summary*, Palo Alto, Calif.: Institute for Research on Education Policy and Practice, Stanford University, September 2007. As of February 1, 2009:

<http://irepp.stanford.edu/documents/GDF/summary-paper-final.pdf>

Magnuson, Katherine A., and Jane Waldfogel, “Early Childhood Care and Education: Effects on Ethnic and Racial Gaps in School Readiness,” *Future of Children*, Vol. 15, No. 1, 2005, pp. 169–196.

Mashburn, Andrew J., Robert C. Pianta, Bridget K. Hamre, Jason T. Downer, Oscar A. Barbarin, Donna Bryant, Margaret Burchinal, Diane M. Early, and Carollee Howes, “Measures of Classroom Quality in Prekindergarten and Children’s Development of Academic, Language, and Social Skills,” *Child Development*, Vol. 79, No. 3, May–June 2008, pp. 732–749.

McDonald, Davida, *Elevating the Field: Using NAEYC Early Childhood Program Accreditation to Support and Reach Higher Quality in Early Childhood Programs*, Washington, D.C.: National Association for the Education of Young Children, January 2009. As of January 15, 2009:

<http://www.naeyc.org/policy/state/pdf/NAEYCpubpolReport.pdf>

Munger, Molly, Elliot Ling, Grace Kim, and Peter Manzo, *California’s Preschool Space Challenge: What Preschool Advocates, Parents, and Policy-Makers Need to Know*, Los Angeles, Calif.: Advancement Project, February 15, 2007. As of April 29, 2009:

<http://advancementprojectca.org/preschool/>

NACCRRRA—see National Association of Child Care Resource and Referral Agencies.

Nackman, Lauren, and Melissa Eiler-White, *Issues and Options: Developing Safety and Quality Ratings for Childcare*, Sacramento, Calif.: Legislative Analyst's Office, January 2007. As of February 1, 2009:
<http://www.lao.ca.gov/2007/childcare/childcare.htm>

NAEYC—see National Association for the Education of Young Children.

National Association for the Education of Young Children, “NAEYC Early Childhood Program Standards,” Washington, D.C.: NAEYC, Web page, undated (a). As of January 15, 2009:
<http://www.naeyc.org/academy/standards/>

———, “Summary of NAEYC-Accredited Programs for Young Children,” Web page, undated (b). As of April 29, 2009:
http://www.naeyc.org/accreditation/center_summary.asp

———, *NAEYC Early Childhood Program Standards and Accreditation Criteria: The Mark of Quality in Early Childhood Education*, Washington, D.C., 2005.

National Association of Child Care Resource and Referral Agencies, “State Licensing Regulations,” Web page, undated. As of February 1, 2009:
http://www.naccrra.org/policy/state_licensing/

National Early Childhood Accountability Task Force, *Taking Stock: Assessing and Improving Early Childhood Learning and Program Quality*, Washington, D.C., 2007. As of April 29, 2009:
http://www.pewtrusts.org/uploadedFiles/wwwpewtrustsorg/Reports/Pre-k_education/task_force_report1.pdf

National Scientific Council on the Developing Child, *Young Children Develop in an Environment of Relationships*, Cambridge, Mass.: Center on the Developing Child at Harvard University, working paper 1, Summer 2004. As of April 29, 2009:
<http://www.developingchild.net/pubs/wp-abstracts/wp1.html>

Nelson, Geoffrey, Anne Westhues, and Jennifer MacLeod, “A Meta-Analysis of Longitudinal Research on Preschool Prevention Programs for Children,” *Prevention and Treatment*, Vol. 6, December 2003, pp. 1–34. As of April 29, 2009:
http://www.hm-treasury.gov.uk/d/cypreview2006_cphva7.pdf

Pianta, Robert C., Carollee Howes, Margaret Burchinal, Donna Bryant, Richard Clifford, Diane Early, and Oscar Barbarin, “Features of Pre-Kindergarten Programs, Classrooms, and Teachers: Do They Predict Observed Classroom Quality and Child-Teacher Interactions?” *Applied Developmental Science*, Vol. 9, No. 3, 2005, pp. 144–159. As of April 29, 2009:
<http://www.fpg.unc.edu/%7Encedl/pdfs/ADS0903pp144-159.pdf>

Prayaga, Rena Brar, *First 5 California Power of Preschool Program Evaluation Meta-Analysis*, prepared for First 5 California by Evaluation Matters, Sacramento, Calif.: First 5 California Children and Families Commission, forthcoming.

Pre-K Now, “Pre-K Teachers Resource Center: Research-Based Curricula,” Web page, undated. As of January 15, 2009:
<http://www.preknow.org/educators/resource/curricula.cfm>

Proposition 10, California Children and Families First Act of 1998. As of May 12, 2009:
<http://www.cfcf.ca.gov/PDF/ccfcact.pdf>

Proposition 82, Preschool for All Act, 2006. As of May 12, 2009:
<http://www.caag.state.ca.us/initiatives/pdf/SA2005RF0088.pdf>

Public Law 89-10, Elementary and Secondary Education Act, 1965.

Public Law 107-110, No Child Left Behind Act of 2001, January 8, 2002. As of April 29, 2009:
http://frwebgate.access.gpo.gov/cgi-bin/getdoc.cgi?dbname=107_cong_public_laws&docid=f:publ110.107.pdf

Public Law 111-5, American Recovery and Reinvestment Act of 2009, September 30, 2008. As of April 29, 2009:
http://frwebgate.access.gpo.gov/cgi-bin/getdoc.cgi?dbname=110_cong_bills&docid=f:h2638enr.txt.pdf

Reardon, Sean F., *Sources of Educational Inequality: The Growth of Racial/Ethnic and Socioeconomic Test Score Gaps in Kindergarten and First Grade*, University Park, Penn.: Population Research Institute, Pennsylvania State University, August 16, 2003. As of January 15, 2009:
http://www.pop.psu.edu/general/pubs/working_papers/psu-pri/wp0305R.pdf

Reardon, Sean F., and Claudia Galindo, *Patterns of Hispanic Students’ Math and English Literacy Test Scores in the Early Elementary Grades: A Report to the National Task Force on Early Childhood Education for Hispanics*, Tempe, Ariz.: National Task Force on Early Childhood Education for Hispanics, October 2006. As of April 29, 2009:
<http://www.ecehispanic.org/work/patterns.pdf>

Reynolds, Arthur J., “One Year of Preschool Intervention or Two: Does It Matter?” *Early Childhood Research Quarterly*, Vol. 10, No. 1, March 1995, pp. 1–31.

Reynolds, Arthur J., and Judy A. Temple, “Quasi-Experimental Estimates of the Effects of a Preschool Intervention,” *Evaluation Review*, Vol. 19, No. 4, 1995, pp. 347–373.

Robin, Kenneth B., Ellen C. Frede, and W. Steven Barnett, *Is More Better? The Effects of Full-Day vs Half-Day Preschool on Early School Achievement*, New Brunswick, N.J.: National Institute for Early Education Research, working paper, May 2006. As of April 29, 2009:
<http://nieer.org/docs/?DocID=144>

Rumberger, Russell W., and Brenda Arellano Anguiano, *Understanding and Addressing the California Latino Achievement Gap in Early Elementary School*, Santa Barbara, Calif.: University of California Latino Policy Institute, working paper 2004-01, July 2004. As of January 15, 2009:

http://www.lmri.ucsb.edu/publications/04_rumberger-arellano.pdf

SB—see California Senate Bill.

Shonkoff, Jack P., and Deborah A. Phillips, eds., *From Neurons to Neighborhoods: The Science of Early Child Development*, Washington, D.C.: National Academy Press, 2000. As of May 23, 2008:

<http://www.nap.edu/catalog/9824.html>

Schumacher, Rachel, Danielle Ewen, Katherine Hart, and Joan Lombardi, *All Together Now: State Experiences in Using Community-Based Child Care to Provide Pre-Kindergarten*, Washington, D.C.: Center for Law and Social Policy, February 2005.

Schweinhart, Lawrence J., *Lifetime Effects: The High/Scope Perry Preschool Study Through Age 40*, Ypsilanti, Mich.: High/Scope Press, 2005.

Schweinhart, Lawrence J., and David P. Weikart, "The High/Scope Perry Preschool Program," in Richard H. Price, Emory L. Cowen, Raymond P. Lorion, and Juli Ramos-McKay, eds., *14 Ounces of Prevention: A Casebook for Practitioners*, Washington, D.C.: American Psychological Association, 1988, pp. 53–65.

Stone, Diana L., *Funding the Future: States' Approaches to Pre-K Finance*, Washington, D.C.: Pre-K Now, February 2006.

Sussman, Carl, and Amy Gillman, *Building Early Childhood Facilities: What States Can Do to Create Supply and Promote Quality*, New Brunswick, N.J.: National Institute for Early Education Research, policy brief 14, April 2007. As of April 29, 2009:

<http://nieer.org/docs/?DocID=172>

Thompson, Ross A., "The Roots of School Readiness in Social and Emotional Development," in Ewing Marion Kauffman Foundation, *Set for Success: Building a Strong Foundation for School Readiness Based on the Social-Emotional Development of Young Children*, Kansas City, Mo., 2002, pp. 8–29.

Title I—see Public Law 89-10.

Title 22—see California Code of Regulations, Title 22.

Whitebook, Marcy, "Accreditation as an Indicator of Program Quality: What Research Tells Us," in Sue Bredekamp and Barbara A. Willer, eds., *NAEYC Accreditation: A Decade of Learning and the Years Ahead*, Washington, D.C.: National Association for the Education of Young Children, 1996, pp. 31–46.

Whitebook, Marcy, Sharon Ryan, Fran Kipnis, and Laura Sakai *Partnering for Preschool: A Study of Center Directors in New Jersey's Mixed-Delivery Abbott Program*, Berkeley, Calif.: Center for the Study of Child Care Employment, 2008. As of April 29, 2009:

http://www.iir.berkeley.edu/cscce/pdf/partnering_preschool_report08.pdf

Whitebook, Marcy, Laura Sakai, and Carolee Howes, *NAEYC Accreditation as a Strategy for Improving Child Care Quality: An Assessment by the National Center for the Early Childhood Work Force*, Washington, D.C.: National Center for the Early Childhood Work Force, 1997. As of January 15, 2009:

<http://www.ccw.org/pubs/NAEYC.pdf>

Whitebook, Marcy, Laura Sakai, Fran Kipnis, Una Lee, Dan Bellm, Richard Speiglmán, Mirella Almaraz, LaToya Stubbs, and Paulina Tran, *California Early Care and Education Workforce Study: Licensed Child Care Centers, Statewide 2006*, Berkeley, Calif.: Center for the Study of Child Care Employment, and San Francisco, Calif.: California Child Care Resource and Referral Network, 2006a. As of April 29, 2009:

http://www.irle.berkeley.edu/cscce/pdf/statewide_centers.pdf

———, *California Early Care and Education Workforce Study: Licensed Family Child Care Providers, Statewide 2006*, Berkeley, Calif.: Center for the Study of Child Care Employment and San Francisco, Calif.: California Child Care Resource and Referral Network, 2006b. As of April 29, 2009:

http://www.irle.berkeley.edu/cscce/pdf/statewide_providers.pdf

Witte, Ann Dryden, and Magaly Queralt, *What Happens When Child Care Inspections and Complaints Are Made Available on the Internet?* Cambridge, Mass.: National Bureau of Economic Research, working paper 10227, January 2004. As of April 29, 2009:

<http://www.nber.org/papers/w10227>

Wolfe, Barbara, and Scott Scrivner, "Providing Universal Preschool for Four-Year-Olds," in Isabel V. Sawhill, ed., *One Percent for the Kids: New Policies, Brighter Futures for America's Children*, Washington, D.C.: Brookings Institution Press, 2003, pp. 113–135.

Zan, Betty, "NAEYC Accreditation and High Quality Preschool Curriculum," *Early Education and Development*, Vol. 16, No. 1, 2005, pp. 85–102.

Zellman, Gail L., and Michal Perlman, *Child-Care Quality Rating and Improvement Systems in Five Pioneer States: Implementation Issues and Lessons Learned*, Santa Monica, Calif.: RAND Corporation, MG-795-AECF/SPF/UWA, 2008. As of April 29, 2009:

<http://www.rand.org/pubs/monographs/MG795/>

Zellman, Gail L., Michal Perlman, Vi-Nhuan Le, and Claude Messan Setodji, *Assessing the Validity of the Qualistar Early Learning Quality Rating and Improvement System as a Tool for Improving Child-Care Quality*, Santa Monica, Calif.: RAND Corporation, MG-650-QEL, 2008. As of April 29, 2009: <http://www.rand.org/pubs/monographs/MG650/>