



## **The Educational, Social, and Economic Impact of Investing in Oregon Head Start Prekindergarten (OPK)**

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11/16/06

### **Introduction**

An ever growing body of research demonstrates that investments in pre-k programs such as Oregon Head Start Prekindergarten (OPK) yield dramatic short, medium, and long-term benefits. The short-term benefits include increased school readiness at kindergarten entry and children who are more likely to meet third grade reading benchmarks. In the medium-term, children rely less on special education and are less likely to be held back a grade or become juvenile delinquents. In the long-term, participants go on to earn more as adults and cost the public less in crime and in social services. This document reviews Oregon data and national research that allow us to gauge the likely impacts of investments in OPK.

### **Key Findings on the Impact of Oregon Head Start Prekindergarten:**

- **Researchers have identified the following as significant risk factors for school failure: living in poverty; having a mother without a high school diploma; being an English language learner; and living in a single parent family. Almost all children in OPK have at least one of these risk factors and most have more than one. Research shows that pre-k programs have the greatest benefits for children with these kinds of risk factors.**
- **At the start of kindergarten, children from high-income families have cognitive scores 60% higher than children from low-income backgrounds.**
- **Galileo Assessment scores show that children in OPK make substantial gains in language and literacy, early math and social and emotional development.**
- **National "gold standard" study shows that Head Start cuts the achievement gap almost in half.**
- **RAND study demonstrates that states that invest in pre-k show improved National Assessment of Educational Progress (NAEP) scores.**
- **Projections from longitudinal research show that for each child sent to OPK, the K-12 system could save over \$2,400 and the public would save \$4,333 just from reductions in juvenile crime.**
- **Estimates for the lifetime benefits from investments in high-quality pre-k range from \$2.62 for every dollar invested for a non-targeted preschool "for all" program for California to \$17 for the Perry Preschool Program, a model program for high risk children in Ypsilanti, MI.**

- **Because 90% of brain development occurs before age 6, early education has the highest return of any investments in ‘human capital.’**

### **OPK Serves Kids Most At-risk for School Failure**

OPK targets children most at-risk for school failure. These are the children for whom investment in early education has the greatest impact. Commonly agreed upon risk factors include living in poverty, having a single parent, having a mother with less than a high school diploma, and living in a family whose primary language is not English.<sup>1</sup> Children with multiple risk factors face even tougher odds.

OPK targets children in poverty, one of the most significant impediments to school success. In addition to facing poverty, a high percentage of OPK children are subject to more than one of these risk factors, with 46% of the children currently enrolled coming from single parent families and 36% having mothers without a high school diploma.

<b>Percentage of OPK Children with Risk factors for School Failure</b>	
<b>Living In poverty</b>	<b>94%*</b>
<b>English Language Learner</b>	<b>40%</b>
<b>Single Parent Family</b>	<b>46%</b>
<b>Mother with less than high school diploma</b>	<b>36%</b>

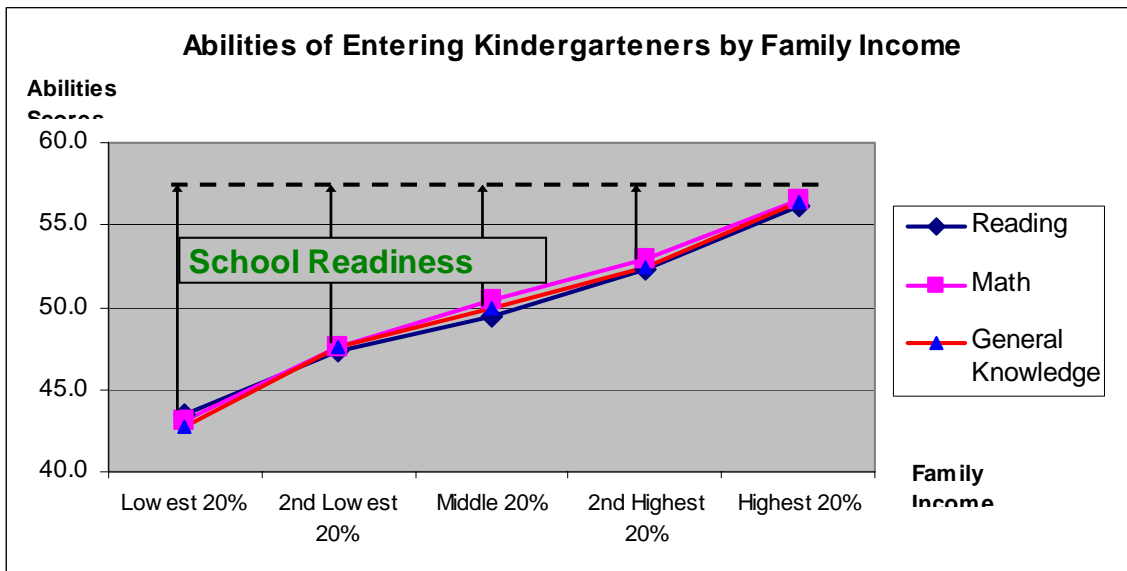
Source: Oregon Department of Education, OPK PIR Reports.

\* 10% of OPK spaces are reserved for children with disabilities. Some of these children with disabilities are from families living above the poverty level.

### **Kids from Low-Income Families Start Behind**

In 1998, the National Center for Education Statistics began a longitudinal study of children’s school performance through the early elementary years. As a preliminary part of this study, researchers tested and collected family information on a nationally representative sample of 19,000 children as they started kindergarten. The data from this study (referred to as ECLS-K) provided the first comprehensive look at academic attainment at school entry.<sup>2</sup>

The story that this data tells is quite startling: the academic achievement gap is well in place before children even reach the kindergarten door. Children from low-income families performed significantly behind their more advantaged peers on tests of reading, math and general knowledge. Not only was a family’s social-economic status found to be the biggest determinant of kindergarten readiness, the average cognitive scores of children from the highest SES were 60% higher than children from the lowest SES group.<sup>3</sup>



Source: NIEER, 2005. Analysis of ECELS-K data.

### Children in OPK Make Substantial Gains in Achievement

At the beginning and end of the 2003-4 school year, researchers tested 570 children in 5 OPK programs from across the state (Multnomah, Lane, Harney and Lincoln) using the Galileo Assessment System. These children showed substantial gains in such areas as language and literacy, early math, and social and emotional development.

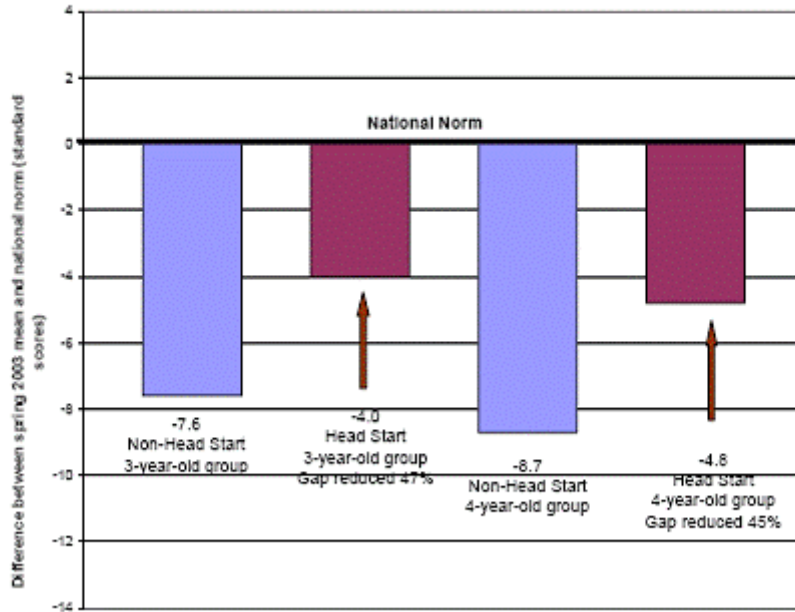
AREAS OF LEARNING	% PROFICIENT – FALL 2003	% PROFICIENT – SPRING 2004
Language and Literacy	12%	62%
Early Math	8%	25%
Social and Emotional	37%	83%

Source: “Oregon Head Start Prekindergarten: Investing in Oregon’s Future,” Oregon Department of Education. March, 2005.

### Head Start Reduces the Achievement Gap

In June 2005, the U.S. Department of Health and Human Services released results from the Head Start Impact Study showing that Head Start dramatically reduced the achievement gap.<sup>4</sup> This was a “gold standard” study in which 5,000 children from across the country were randomly assigned to either a Head Start program or a control group. The children in this study were a nationally representative sample of children eligible for Head Start. The Head Start children performed substantially closer to national norms than the children in the control group, with the achievement gap in pre-reading skills being cut almost in half, significantly improving the likelihood that they will read at-grade level in third grade.

*Exhibit 4: Impact of Head Start on Reducing the Achievement Gap in Children's Pre-Reading Skills (Woodcock-Johnson III Letter-Word Identification): Comparing Spring 2003 Means to National Norms by Age Group*



Source: “Head Start Impact Study First Year Findings,” U.S. Department of Health and Human Services. June, 2005

### **States that Invest in Pre-K Show Improved NAEP Scores**

In 2000, the RAND Corporation released, “Improving Student Achievement: What State NAEP Test Scores Tell Us.” This report compared state National Assessment of Educational Progress (NAEP) math and reading scores from 1990 through 1996, taking into account differences in the demographics of these states. A key finding of this study is that states that invest in pre-k show improved 4<sup>th</sup> grade math and reading scores. “Other things being equal,” concluded the reports authors, “NAEP scores are higher in states that have ... more children in public prekindergarten programs.” (xxvi).<sup>5</sup> The researchers found that for every 10 percentage point increase in pre-k enrollment there was a 1-2 point increase in NAEP scores. Unlike OPK, not all of the state programs included in the RAND study are targeted to at-risk children. Because Oregon’s program focuses on children who are at the greatest risk for school failure, it is likely to produce an even larger improvement, especially for the groups of children who are otherwise least likely to meet No Child Left Behind (NCLB) standards.

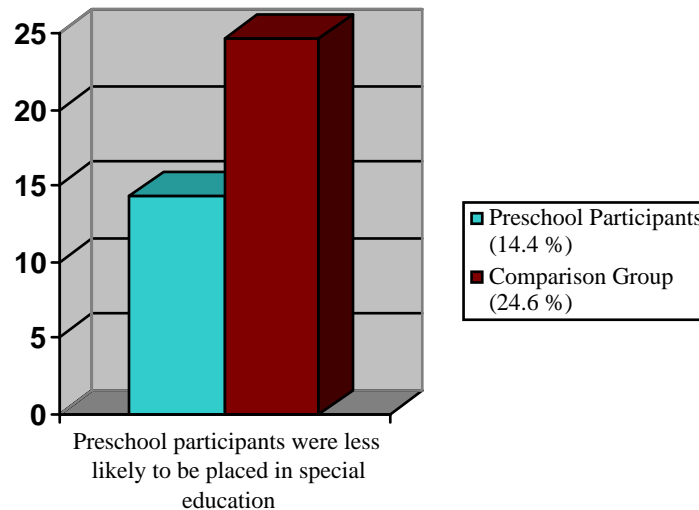
### **Investing in OPK Reduces Costs of Special and Remedial Education and Juvenile Crime**

Research demonstrates that children who attend OPK and Head Start arrive at kindergarten better prepared for school success. There is yet to be a study that follows children who attended OPK and a control group through high school. However, a number of high-quality studies of programs remarkably similar to OPK have tracked participants into young adulthood and beyond. All of these studies of high-quality pre-k

programs for at-risk children have showed dramatic reductions in grade repetition, special education and arrests for juvenile crime.

The research that provides the best basis for analysis of the medium and long-term impacts of OPK is the Chicago Longitudinal study of the Chicago Child-Parent Centers.<sup>6</sup> The Chicago Child-Parent Centers provide pre-kindergarten education and parental support to children and families in a selection of Title I eligible school districts in Chicago. It is a publicly funded program, replicated at multiple sites over many years. The program began in the mid-seventies and continues today in 15 school districts in Chicago. The model is also currently being replicated in Wisconsin. The Chicago Longitudinal Study followed 989 participants, as well as a comparison group, through age 21.

Children who attended the Chicago CPC preschool were 15.4% more likely to avoid being held back a grade and, on average, spent .7 fewer years in special education programs.<sup>7</sup>



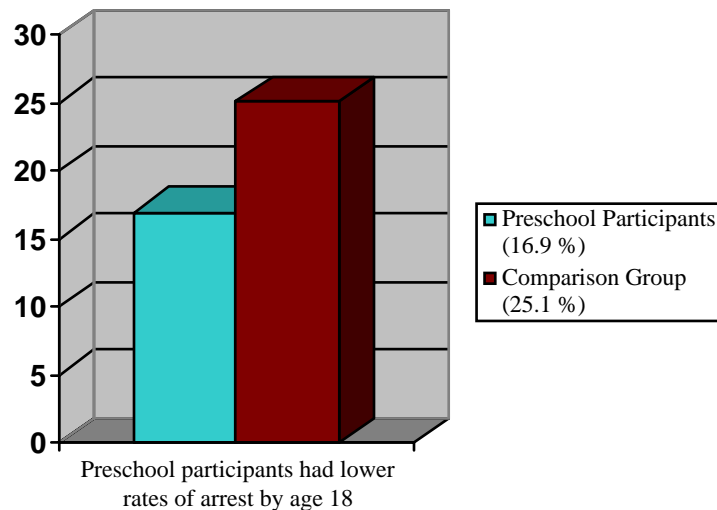
source: Arthur J. Reynolds et al., "Age 21 Cost-Benefit Analysis of the Title I Chicago Child-Parent-Centers," *Educational Evaluation and Policy Analysis*, Vol. 24, No4., Winter 2002.

If Oregon saw a similar reduction in special education and grade repetition, the present value of these savings to the school system would be **\$2,453** per OPK participant.<sup>8</sup> The savings would be much higher – a full **\$1,639 more** – if it were not for the fact that these children are also more likely to graduate from high school, costing the school system more than their peers who drop out.<sup>9</sup> However, not only is the cost of having a child actually attend his or her junior and senior years of high school one that we should be happy to bear, it is an investment that will pay off in higher life time earnings to the participants and increased tax revenue for the public.

These numbers likely underestimate the true value of high quality pre-kindergarten to the schools. At-risk children who attend high quality pre-kindergarten not only do better, they also have better attitudes towards learning and school.<sup>10</sup> Both of these factors are conducive to an improved educational environment that not only benefits these kids, but

also benefits the kids with whom they share classrooms. Recent studies have suggested that this improved classroom atmosphere leads to more efficient schools and yields its own savings. Improving the academic performance of those kids most at-risk reduces the amount of time teachers have to devote to “troubled kids” and increases the resources that can be spent on all children. According to Clive Belfield’s analysis, the impact on teacher job satisfaction and retention, school safety and general improvement in the overall learning environment could more than double the savings to schools.<sup>11</sup>

In addition to these academic gains, at-risk children who attend high quality pre-k programs also show significant improvements in other “life skills.” These improvements have been consistently shown to result in reduced criminal activity. Participants in the CPC preschool were significantly less likely to be involved in juvenile crime than their non-CPC peers. Participation lowered the rate of juvenile arrest by close to one-third. Participants in the Chicago CPC Preschool program had 33 percentage points fewer petitions to juvenile court than the comparison group.<sup>12</sup>



source: Arthur J. Reynolds et al., "Age 21 Cost-Benefit Analysis of the Title I Chicago Child-Parent-Centers," *Educational Evaluation and Policy Analysis*, Vol. 24, No4., Winter 2002.

This reduction in juvenile crime results in savings to the judicial system, to youth correctional facilities, and to the potential victims of crime. The savings to government is about **\$978** per participant. The benefit to potential crime victims adds **\$3,355**, for a total savings from reduced crime of **\$4,333**.

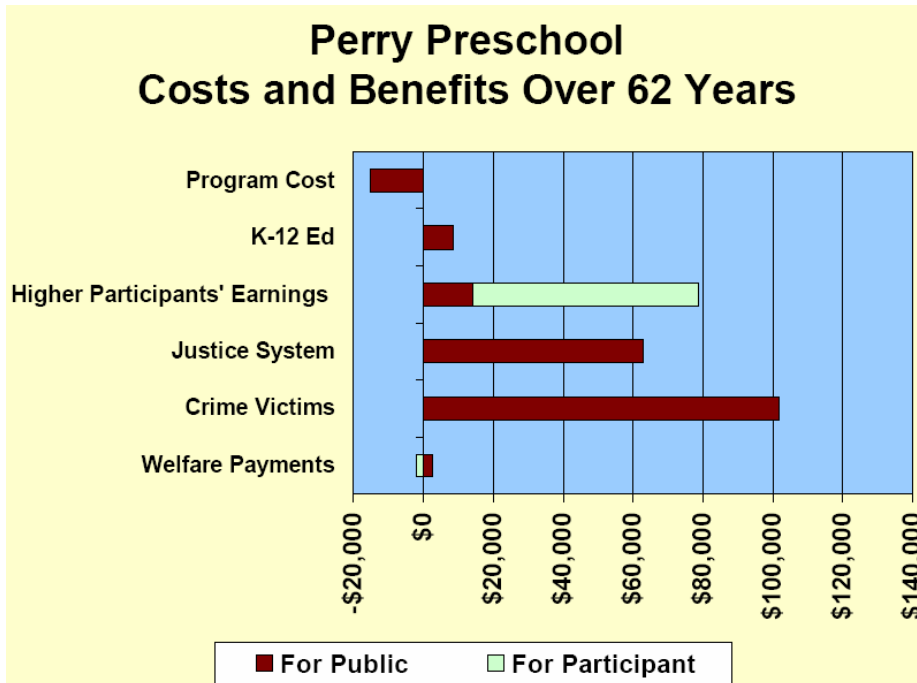
### **Estimates of the Economic Return of Investing in Pre-k over a Lifetime**

Research shows that pre-k programs such as OPK have a lasting impact on the academic performance and life success of at-risk children. Children who participate in these programs are more likely to graduate from high school and avoid juvenile delinquency. Children who graduate from high school go on to earn more money and are less likely to be convicted of a crime as adults. Every study that has estimated the cost and benefits of pre-k programs has found that they more than pay for themselves.<sup>13</sup> Estimates range from

\$2.62 for every dollar invested for a non-targeted universal preschool program for California to \$17 for the Perry Preschool Program.<sup>14</sup>

Projecting from the age 21 results of the Chicago Longitudinal Study yields tremendous economic returns over a lifetime. Based on the higher high school graduation rates, the average participant should earn an additional **\$43,000** over a lifetime, with over **\$18,000** going to federal and state taxes. (Because future earnings are discounted at 3% per year, the present value of income from later in life, where earnings are usually the greatest, is substantially reduced. Undiscounted, the average additional earnings per participant is over \$90,000).

As already noted, these figures are based on projections from achievement at age 21. Other studies have followed participants in model early intervention programs for even longer. The High/Scope Perry Preschool study has now followed participants in its preschool program and a randomly assigned control group through age 40. The Perry Preschool Study still provides a useful gauge for how tremendous the long-term impact of early education programs can be. It also demonstrates that projections of the long-term benefits, even based on data from 15 years after the completion of the program, may underestimate the true economic returns. A cost-benefit analysis of the Perry Preschool program has shown a lifetime pay-back of over **\$250,000** per participant. This includes over **\$170,000** in savings from reduced crime (crime victims plus justice system) and over **\$60,000** in increased lifetime earnings.<sup>15</sup>



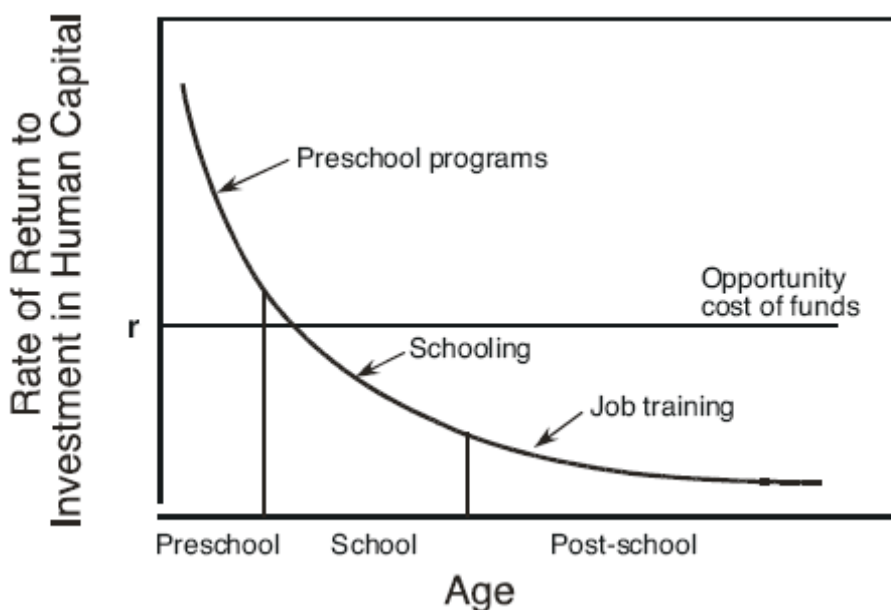
Source: Rob Grunewald and Art Rolnick, “Early Childhood Development: Economic Development with a High Public Return,” Federal Reserve Bank of Minneapolis

**Early Education has Highest Return of Any Investment in ‘Human Capital’**

In a recent study, Nobel Laureate and University of Chicago economist James Heckman compared the return on investments in education made at various point in a lifetime.

After looking at the evidence from job training programs, middle and high school education, and early age programs, Heckman concluded that preschool programs had by far the highest return. Not only did they have the greatest impact over time, they made all later investments in education more efficient and effective. Heckman explains the reason for this finding as, “skill begets skill; learning begets learning.”<sup>16</sup>

This economic research confirms what neuroscientists have also discovered: the first five years of life are a critical period of brain development. According to neuroscientists, 90% of brain development takes place before a child reaches the age of six.<sup>17</sup> Not only is this a key period of growth, it is also a period in which the development of different parts of the brain, such as those that process language, is influenced by environmental stimuli.<sup>18</sup>



Source: James Heckman, “Technology and Neuroscience of Skill Formation,” Presentation to Committee for Economic Development. July, 2006

## Conclusion

Oregon Head Start Prekindergarten (OPK) is an investment whose pay-off well exceeds the cost. These benefits include: children who arrive at kindergarten prepared to learn and more likely to be capable readers in third-grade; adolescents who stay in school and out of crime; and adults who make a living wage, pay taxes and use fewer social services. These are just some of the tangible benefits of investing in OPK. Not to be forgotten is the value of helping put some of our most vulnerable children on the right track for healthy and successful lives.

<sup>1</sup> Lynn A. Karoly et al., “Many Happy Returns,” RAND Review, Fall 2005.

<sup>2</sup> “Entering Kindergarten: Findings from the Condition of Education 2000.” U.S. Department of Education and National Center for Education Statistics. March, 2001. Valerie E. Lee and David T. Burkam, *Inequality*

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at the Starting Gate: Social Background Differences in Achievement as Children Begin School. Economic Policy Institute, 2002.

<sup>3</sup> Valerie E. Lee and David T. Burkam, *Inequality at the Starting Gate: Social Background Differences in Achievement as Children Begin School*. Economic Policy Institute, 2002, p. 2.

<sup>4</sup> “Head Start Impact Study First Year Findings,” U.S. Department of Health and Human Services. June, 2005.

<sup>5</sup> David Grissmer, Ann Flanagan, Jennifer Kawata, and Stephanie Williamson, *Improving Student Achievement: What State NAEP Test Scores Tell Us* (Rand, 2000).

<sup>6</sup> All data on the Chicago Child-Parent Centers is from Arthur J Reynolds., *Success in Early Intervention: The Chicago Child-Parent Centers* (University of Nebraska, 2000) and Arthur J. Reynolds et al., “Age 21 Cost-Benefit Analysis of the Title I Chicago Child-Parent-Centers,” *Educational Evaluation and Policy Analysis*, Vol. 24, No4., Winter 2002.

<sup>7</sup> The average reduction of .7 years of special education reflects the fact that once a child enters special education they usually stay in it until graduation. An individual child may have as much as 12 years in special education.

<sup>8</sup> These calculations are based on additional cost of \$6,228 per child in special education in regular classes and \$7,816 for an additional year of schooling. Inflation adjusted figures from The Chalkboard Project Citizen Feedback Guide.

<sup>9</sup> All future benefits are discounted at a rate of 3% per year.

<sup>10</sup> See Karen Schulman, “Overlooked Benefits of Prekindergarten.” NIEER Policy Brief. March, 2005. Available at [www.nieer.org](http://www.nieer.org).

<sup>11</sup> For a recent attempt to quantify the value of this increased classroom efficiency see Clive Belfield, (March, 2005). “The Fiscal Impact of Universal Pre-K: Case Study Analysis for Three States,” *Invest in Kids Working Paper No. 6*, Committee for Economic Development Invest in Kids Working Group, pp. 7-9.

<sup>12</sup> This number is an average that reflects the fact that while some youth had no petitions to juvenile court, others had multiple encounters with the law that resulted in court referrals.

<sup>13</sup> For a survey of this cost-benefit research see Arthur J. Reynolds and Judy A. Temple, “Economic Returns of Investing in Preschool Education” in *A Vision of Universal Preschool Education*, Edward Zigler et al., (Cambridge University Press, 2006).

<sup>14</sup> Lynn A. Karoly and James H. Bigelow, *The Economics of Investing in Universal Preschool in California*. RAND Corporation, 2005; Schweinhart, L.J. et al., “Lifetime effects: The High/Scope Perry Preschool study through age 40.” [www.highscope.org](http://www.highscope.org).

<sup>15</sup> Schweinhart, L.J. et al., “Lifetime effects: The High/Scope Perry Preschool study through age 40.” [www.highscope.org](http://www.highscope.org). See also Art Rolnick and Rob Grunewald, “Early Child Development: Economic Development with a High Public Return,” Federal Reserve of Minneapolis. March, 2003: <http://www.minneapolisfed.org/research/studies/earlychild/abc-part2.pdf>.

<sup>16</sup> James J. Heckman and Dimitriy V. Masterov. “The Productivity Argument for Investing in Young Children.” Committee for Economic Development. October, 2004.

<sup>17</sup> Jack p. Shonkoff and Deborah A. Phillips. *From Neurons to Neighborhoods: The Science of Early Child Development*, (National Academy Press, 2000).

<sup>18</sup> Eric I. Knudsen et al. “Economic, neurobiological and behavioral perspectives on building America’s future workforce.” *Proceedings of National Academy of Sciences*. (Vol. 103, No. 27: July, 2006), p. 10155 – 10162.