The best start for students: Why Minnesota needs universal pre-kindergarten

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I. What is EPIC?

The Educator Policy Innovation Center, or EPIC, was founded by Education Minnesota to bring together groups of experienced educators to provide research-proven solutions to the challenges facing Minnesota schools. Each EPIC advisory group performs a comprehensive review of academic literature on a given issue and adds to our understanding by sharing classroom experiences. After discussing the academic literature and its real-world implications for students, the educators recommend policies to meet the challenges. The coupling of sound academic research with actual classroom experience means EPIC's policy recommendations are uniquely valuable because they combine the best from academia and practical experience.

The EPIC research advisory committees are open to all members of Education Minnesota because although practicing educators are the experts when it comes to education policy, the voice of the educator has often been absent in education policy discussions. Academics, politicians, and CEOs proclaim what is best for education, often with no grounding or experience in how their proposals affect real classrooms with actual students. As a result, our schools are hampered by disjointed, inefficient and at times harmful state and federal policies.

Educators see every day how these policies affect Minnesota's children. EPIC ensures policymakers will now have access simultaneously to the best academic research as well as to the thinking of front-line educators on the most pressing issues in education.

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II. The EPIC Pre-Kindergarten Advisory Committee Members

> "Early childhood is a sacred time for learning and exploration. As educators, we are charged with protecting, empowering and advocating for Minnesota's children and their families."
>
> *– Sandra Santiago Pickett, Minneapolis Public Schools*

The Educator Policy Innovation Center at Education Minnesota convened early childhood and kindergarten teachers from across Minnesota during the summer of 2015 to evaluate the pre-kindergarten options available for Minnesota families and to consider how better to meet the needs of Minnesota families and the communities in which they live. The EPIC pre-K committee consists of teachers from urban, suburban, tribally-owned and rural areas, who work with a very broad range of students. Their collective experience and wisdom is reflected in their recommendations for a new pre-K system available to all of Minnesota's families.

Kimberly Antonsen has been teaching early childhood for the past 16 years, 14 of those years working in both the Detroit Lakes and the Mahnomen school districts. For the last two years, she has been full time at Ogema Elementary School teaching all-day, every day preschool. Antonsen is an active member of Education Minnesota and works to bring knowledge of early childhood to her colleagues around the state.

Janet Kujat has been a kindergarten teacher in the Minneapolis Public Schools for 39 years. She received her bachelor's degree in elementary education from Augsburg College. Her master's degree is in early childhood education from the University of Minnesota. Kujat is a National Board Certified Teacher as an early childhood generalist. During summer, she is a national professional development trainer for the American Federation of Teachers. She is an officer in the Minneapolis Federation of Teachers and a past Education Minnesota Governing Board member. Kujat has been doing home visits with all of her kindergarten children's families for 20 years. She teaches at Dowling Urban Environmental School in south Minneapolis.

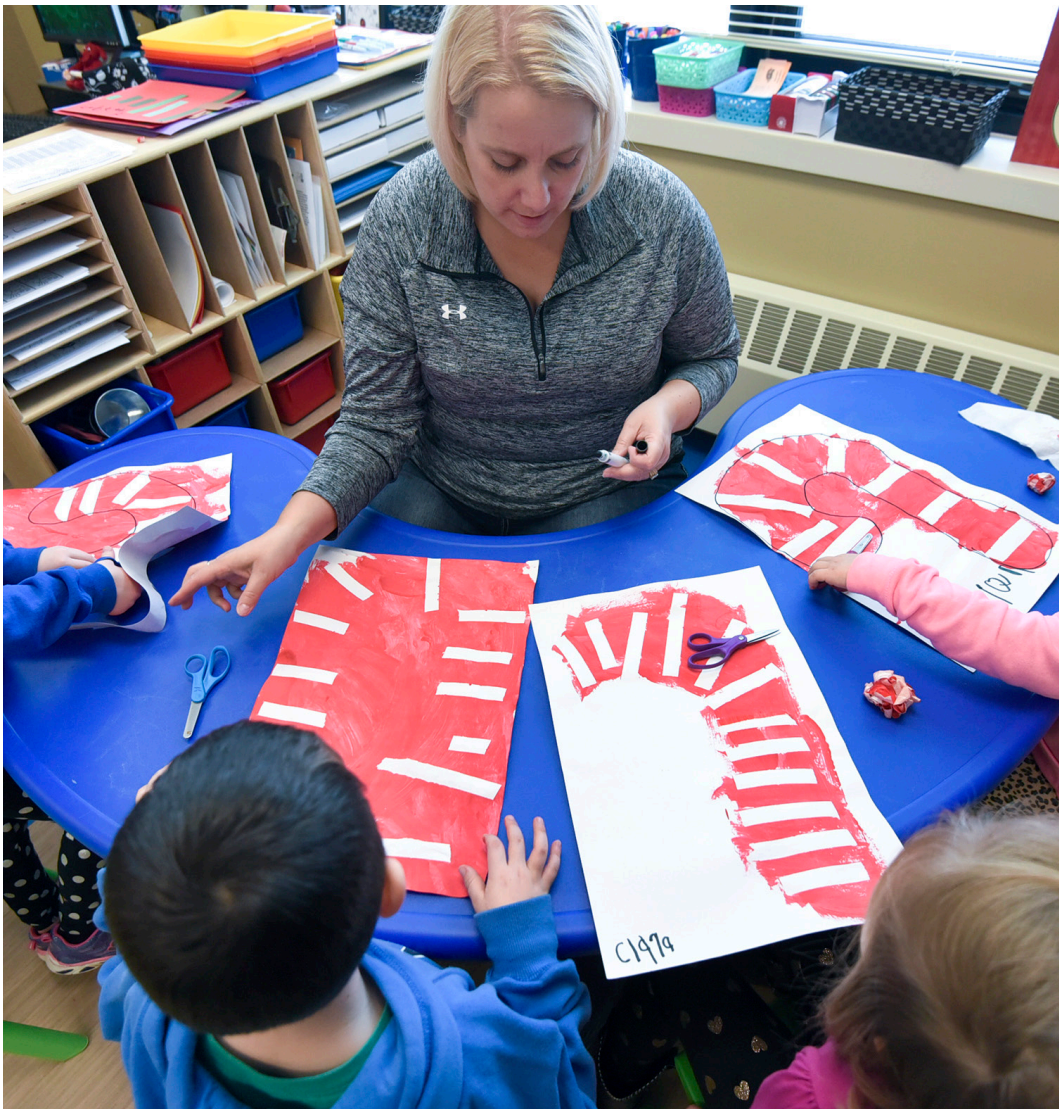
Lisa Putz teaches kindergarten at Birchview Elementary in the Wayzata school district. She began teaching as a Twin Cities corps member of Teach for America. Through that program, she discovered her passion for early childhood education. Putz received her Master of Arts degree in teaching from Hamline University in 2013.

Sandra Santiago Pickett is a second-generation Puerto Rican from the Humboldt Park neighborhood in Chicago. She obtained her B.A. in education from Roosevelt University and is a candidate for a master's degree in bilingual/bicultural studies at DePaul University. Santiago Pickett has been an early childhood teacher since 1995. Her concentration is bilingual and urban education. She has presented her progressive early childhood approach to curriculum development and implementation at teacher conferences throughout Chicago.

Since moving to Minnesota in 2014, she has been a Teach for America mentor teacher. Santiago Pickett is member of Minnesota's League of Latino Educators. She has testified before the Minnesota Legislature on behalf of universal preschool. She also was part of the 2015 Educators 4 Excellence policymaking team.

Katy Smith is a licensed parent educator at Early Childhood Family Education in Winona, Minnesota. Smith has undergraduate degrees in parent education and social work; she has masters' degrees in education and in early childhood public policy and advocacy. In 2011, Smith was honored to be the Minnesota Teacher of the Year. She is the first early childhood educator in the state, and the first parent educator nationally, to be selected for this honor.

Lacey Smith is a National Board Certified Teacher as an early childhood generalist. She teaches kindergarten in a rural Minnesota school. She has previous experience teaching first and second grade in an urban setting in Arizona.



III. Executive Summary

There is little question about the value of providing high-quality pre-K education for children. The growing body of research is conclusive: High-quality pre-K provides dramatic and lifelong benefits to children and solid economic and social benefits to the communities in which they live. Children who participate in pre-K see educational advantages right from the beginning—quantifiable improvements in reading and math scores to be sure—but also more fundamental and lasting effects such as higher high school graduation rates, lower rates of teen pregnancy, higher income levels, and more stability in their family lives.

Under the current system, however, these benefits accrue only to those children and families who are fortunate enough to have found high-quality pre-K. Many low- and middle-income families miss out. Minnesota's current scholarship program was to serve only 5,700 families last year, while according to the Children's Defense Fund, Minnesota is home to 69,000 children under the age of 6 living in poverty, 31,000 of whom live in extreme poverty (Children's Defense Fund). Universal pre-K would also help middle-income families who may not qualify for scholarship programs, but who are nonetheless unable to pay for high-quality pre-K for their children.

States that invest in high-quality pre-K programs also see both immediate and long-term benefits. The early interventions result in fewer students in need of special education services, for example. The longer-term benefits include an increased tax base, lower crime rates, lower divorce rates and reduced social service costs. This early investment pays huge dividends for states in the long term. It simply makes good economic sense.

What's more, investing in universal pre-K is only fair. High-quality universal pre-K is a crucial first step in addressing the equity gaps that plague students in Minnesota schools. Our teachers recount story after story of children who start out behind their peers—children who arrive at kindergarten with limited vocabulary, with few social skills, and in some cases even without the ability to hold a pencil or scissors. These children fall behind their peers from the moment they begin school. This is the start of the achievement gap.

The good news is that the same teachers show us with pride the leaps that these kids make when given the opportunity to attend affordable, high-quality pre-K. And the experience of these teachers is supported by research. When the essential components of high-quality pre-K programs are in place, researchers find "a consistent positive effect on early cognition and school readiness" (Shaw, 2014). Students who might have entered kindergarten at a significant academic and social-emotional disadvantage have the opportunity to start off on the right foot when they attend high-quality pre-K programs. They have the chance to develop positive attitudes toward school by experiencing success in a rich, supportive classroom environment, and they enter kindergarten far more ready to learn.

In Minnesota, we are rightly concerned about our persistent opportunity and achievement gaps. Over the past several years, legislators and stakeholders from around the state have participated in a robust debate about how best to meet the needs of Minnesota's preschool-

aged children. During the 2015 legislative session, despite a strong push from the governor for universal access, the Legislature failed to make any substantive changes to Minnesota's pre-K system, a system that ranks 41st out of the 50 states when it comes to the number of children who have access to high-quality pre-K programming (Barnett, et al., 2015).

Universal pre-K for 4-year-olds offers a solid first step to address the gaps head on. Offering programs that meet high standards to all Minnesota 4-year-olds will give children the chance to start their academic careers in safe, engaging learning environments with trained, effective educators to guide their learning. It will also provide them the chance to experience education in a positive way and to build on that success in kindergarten and beyond.

It is absolutely critical to note, however, that in order for pre-K programs to be effective, and for students and communities to realize the benefits, the programs must meet high standards. The key components of a high-quality program include:

- Universal access
- Licensed early childhood teachers
- Programs run as public school offerings
- Curriculum aligned with the Minnesota Early Childhood Indicators of Progress
- Class size capped at 20 and student/staff ratios capped at 10:1
- Vision, hearing and health screening and referral
- Family outreach and wrap-around services

What stands in the way of providing access to high-quality pre-K for 4-year-olds in Minnesota? Put plainly, adults stand in the way. Some put institutional barriers up to prevent universal access, despite the overwhelming evidence of the benefits of universal pre-K. For example, some school districts assert that they do not have space to house pre-K programs. However, other states have found innovative ways to solve the space issue—by partnering with other agencies and providers to bring high-quality programs to existing spaces, for example. Those states have also accessed different funding streams in order to meet the space challenges. In fact, new sources of federal funds and other revenue streams are being made available for the infrastructure improvements necessary to make pre-K accessible to more families.

Some policy leaders have gotten stuck in believing that the status quo system of subsidies to high-need families is the only way to deliver high-quality programming, ignoring significant evidence to the contrary. And some politicians have prioritized using funds that could be put towards high-quality pre-K for other things, like tax cuts.

All of these adult problems need to be overcome for the sake of our children. Minnesota can and should adopt a universal pre-K program available on a voluntary basis to all 4-year-olds, and it should do so without sacrificing the quality benchmarks that research shows to be necessary to achieve meaningful and lasting benefits.

IV. The Case for High-Quality Universal Pre-K for Minnesota

> "You can identify the kids who have never had a story read to them on the first day of kindergarten."
>
> *– Janet Kujat, kindergarten teacher, Minneapolis Public Schools*

The research is increasingly clear: Early education that prepares children for kindergarten is one of the most effective ways we can improve student achievement, close gaps between racial and socio-economic groups, and create positive education results. Programs targeted at specific populations fail too often to reach their intended population or to deliver effective, sustained curricula. In addition, low-income and middle-income families increasingly find pre-K costs prohibitive. In fact, many middle-income families earn too much to qualify for the targeted programs but not enough to pay for a high-quality program for their 4-year-olds. Minnesota's current scholarship program was to serve 5,700 families last year, while according to the Children's Defense Fund, Minnesota is home to 69,000 children under the age of 6 living in poverty, 31,000 of whom live in extreme poverty (Children's Defense Fund). Universal pre-K would also help middle-income families who may not qualify for scholarship programs, but who are nonetheless unable to pay for high-quality pre-K for their children. Ultimately, we can obtain the greatest public good with public resources by supporting universal access to high-quality pre-K.

When we examine the benefits sustained by low-income children in universal programs and compare them with the results for children in targeted programs, students who have had access to universal programs benefit more than students who have participated in targeted programs. Children who participate in universal pre-K see educational advantages right from the beginning, quantifiable improvements in reading and math scores, too. There are also more fundamental and lasting effects–higher high school graduation rates, lower rates of teen pregnancy, higher income levels, and more stability in their family lives as the students grow up and have families of their own.

Universal pre-K makes sense for Minnesota, but more importantly, it helps us take the first step in addressing the moral imperative of achieving equity for all Minnesota learners. Adopting a high-quality universal pre-K system is one of the most immediate, tangible steps we can take toward closing the achievement and opportunity gaps.

WHY NOW?

One of the driving factors in the push for expansion of high-quality pre-K programs nationwide is that our understanding of brain development is far more advanced than it was when the K-12 school system was designed. We now know that the first five years of life are the years during which most brain development occurs:

> The foundations of brain architecture, and subsequent lifelong developmental potential, are laid down in a child's early years through a process that is exquisitely sensitive to external influence. Early experiences in the home, in other care settings, and in communities interact with genes to shape the developing nature and quality of the brain's architecture. The growth and then environmentally-based pruning of neuronal systems in the first years support a range of early skills, including cognitive (early language, literacy, math), social (theory of mind, empathy, prosocial), persistence, attention, and self-regulation and executive function skills (the voluntary control of attention and behavior). Later skills–in schooling and employment–build cumulatively upon these early skills. (Yoshikawa et al., 2013)

We know now what we did not know decades ago: "Earlier-age educational interventions provide more child development benefits than once supposed" (Bartik, 2014). Given that the brain is more malleable prior to age 5 than in later years, early childhood education can enhance cognitive, social, and emotional skills that will prepare children for later learning (Bartik, 2014). Nobel prize-winning economist James J. Heckman explains: "A large body of empirical work at the interface of neuroscience and social science has established that fundamental cognitive and non-cognitive skills are produced in the early years of childhood, long before children start kindergarten [...]. Later remediation of early deficits is costly, and often prohibitively so" (Heckman & Masterov, 2007).

WHAT ARE THE BENEFITS OF HIGH-QUALITY PRE-K?

There is substantial research to help us answer that question. In fact, as Timothy Bartik points out, "we have better evidence for the effectiveness of early childhood education than for almost any other educational intervention" (2014). This is because social scientists have a critical advantage when looking at preschool programs that they do not have when looking at levels kindergarten through 12th grade: control groups. Everyone goes to fourth grade, and so social scientists cannot compare the effects of a fourth grade education to a group of children who did not participate in the fourth grade. But we can make such assessments of preschool programs because at present, not all children attend pre-K (Bartik, 2014). When we compare students who have attended high-quality preschool with their peers who have not, we can point to a wide array of clear personal benefits. These include increases in cognitive development, high school completion rates, stable employment rates, adult income levels, home and car ownership rates, and family involvement in adulthood. We see additional benefits in reduced special education needs, educational remediation, social service use, criminal involvement, and substance abuse. We are also able to measure the costs of high-quality pre-K programs against their economic benefits and conclude that the costs are dramatically and unequivocally outweighed by the savings benefits.

ACADEMIC ACHIEVEMENT

We see the most dramatic and immediate benefits in the arenas of cognitive development and academic achievement: "Robust evidence suggests that a year or two of center-based

early childhood education for 3- and 4-year-olds, provided in a developmentally appropriate program, will improve children's early language, literacy, and mathematics skills" (Yoshikawa et al., 2013). Gorey's integration of the results of 35 studies of preschool benefits finds that "preschool effects on standardized measures of intelligence and academic achievement were statistically significant, positive, and large; cognitive effects of relatively intense educational interventions were significant and very large, even after 5 to 10 years, and 7 to 8 of every 10 preschool children did better than the average child in a control or comparison group" (Gorey, 2001). Geoffrey Nelson, Anne Westhues and Jennifer MacLeod (2003) integrated the results of 34 preschool experiments and found large cognitive benefits after preschool that remained significant through grade eight.

A 2002 examination of students who had participated in Michigan's School Readiness Program five years previous found that the students who had participated in the preschool program had a higher percentage of satisfactory scores on the state tests for both reading and mathematics. The authors, Zongping Xiang and Lawrence Schweinhart, also found that teachers consistently rated the students who had participated in the preschool program to be significantly more ready to learn than those who had not (2002). Recent work in Boston shows similar gains in reading and math (Shaw, 2014).

High school graduation rates also increase in populations of children who have participated in high-quality preschool programs. Gorey's meta-analysis of 35 preschool studies also found incidences of school dropout to be substantially lower for those who had attended preschool (Gorey, 2001).

Perhaps the most important such study is the High/Scope Perry Preschool study. For five years, the Ypsilanti, Michigan, school district ran the High/Scope Perry Preschool Program for young children. A group of 123 low-income African-American children who were deemed at high risk for school failure were split into two subgroups. Of these 123 students, 58 were randomly assigned to the preschool program and 65 were assigned to no preschool program. Data have been collected on both groups from ages 3-11, and again at ages 14, 15, 19, 27, and 40 (Schweinhart et al., 2005). A larger percentage of the preschool group (77%) than the non-preschool group (60%) graduated from high school. The difference was greater among female students. Among them, 88% from the preschool group graduated from high school while only 46% of female students from the non-preschool group graduated (Schweinhart et al., 2005).

David Deming's 2009 study, which compared children who participated in Head Start to their siblings who did not, found the siblings who participated in the pre-K program 8.5% more likely to graduate from high school than their siblings who did not participate in Head Start. And the 2010 meta-analysis of 123 studies of preschool benefits also found higher graduation rates among those who participated in high-quality preschool than in those who did not (Camilli et al., 2010).

Two other academic benefits cited in many studies and confirmed in the larger meta-analyses are a decrease in the likelihood that children will be retained in the same grade from

one year to the next and a decrease in the chances that children will ever require special education services. Schweinhart (1994), Bartik (2014), and the Missouri Department of Education all cite these findings, as does Gorey (2001) in his meta-analysis of 35 individual studies of the benefits of preschool.

Minneapolis Public Schools' early childhood teacher Sandra Santiago Pickett and Wayzata's kindergarten teacher Lisa Putz point out an additional benefit related specifically to special education. While high-quality pre-K programs reduce the number of students who will ever require special education services, they also make it possible to identify students who do have special education needs much sooner, allowing for educators to put supports in place during a child's pre-K experience. When this happens, children who would otherwise spend most of their kindergarten or first-grade school years falling behind while educators scrambled to identify needs can get those needs addressed when they are 4 years old and can start kindergarten with the necessary supports already in place. Thus, they can tackle new milestones as they develop on pace or closer to on pace with the rest of their peers. Putz explains:

> I have a student in my [kindergarten] class now who has an Individual Education Plan that was in place by the end of his preschool year. The IEP indicates that he had significant special needs. His mom talked to me at the beginning of the year and she was very concerned about him. Now he comes into my classroom and he is no longer manifesting those needs as severely. Some of the difficulties I see on his IEP I could not differentiate if I did not have the IEP. I would not know which kid it was who had some of those needs. This is because those challenges were identified in pre-K, and so his teachers were working on them with him throughout last year. Now, he still has needs, but he was able to make great strides last year and he also has support, and all throughout kindergarten he will have the support he needs to flourish. He may eventually be able to get off his IEP, because very early on his needs were identified, and educators had the opportunity to intervene and put necessary supports in place. (Putz, personal communication, October 2, 2015)

Santiago Pickett teaches pre-K to 4-year-olds in Minneapolis. She tells a story of a current student, M, who in the first few months of pre-K is exhibiting signs that are consistent with the autism spectrum. The value of pre-K for this student is profound, because educators at her school can find out what's going on and get M the support she needs before she loses any unnecessary ground:

> ...all of those things that are happening, we're on it, we're catching them now. If they would wait until kindergarten, all of the things she is getting now—I can't imagine what would happen to her if she wouldn't have shown up in the school system until kindergarten. We can provide support for the family and for the child and get her working at her full potential because even if there is a possibility of autism, she will still receive intervention services. (Santiago Pickett, personal communication, October 3, 2015)

In the long run, therefore, pre-K saves special education costs because of two factors: 1) fewer students ever fall in to the category of needing the services at all, and 2) those who do need special education services are identified earlier, reducing the chances they will need further interventions in later years.

TABLE 1. OTHER PERSONAL AND SOCIAL EFFECTS OF PRESCHOOL PROGRAMS: AGGREGATE RATES AND RATE RATIOS

			Rate (%) of follow up		
Types of outcome measures	*Average years of follow up*	*N*	*Preschool*	*Control or comparison*	*Rate ratio*
Categorical Cognitive-Related					
Identified borderline mentally retarded	8	3	11.3	39.7	0.29
Ever assigned to special education	11	5	17.4	36.4	0.48
School Performance					
Ever held back a grade	9	8	22.3	43	0.52
Not a high school graduate	16	7	26	48.4	0.54
Welfare Dependence					
Currently receives welfare assistance	15	2	12.6	32.3	0.39
Ever received welfare as an adult	25	1	59.5	80.5	0.74
Economic Well-being					
Currently unemployed	17	2	50.2	68.8	0.73
Earnings below poverty criterion	20	2	26.6	84.7	0.67
Not a home owner	25	1	63.1	86.5	0.73
Delinquent and Criminal Behavior					
Ever engaged in delinquent behavior	11	4	30.2	74	0.41
Ever arrested	18	1	23.9	51.1	0.47
Arrested five or more times	25	1	6.6	35.8	0.18
Teenage Pregnancy	15	1	43.4	57.8	0.75*

*Note. N = number of study outcomes. Rate ratio = preschool rate/control-comparison rate. *p < .10. All of the other critical comparisons (aggregate preschool versus control and comparison samples) were significant at p < .05 (x2 test statistic {degrees of freedom = 1}). From "Early Childhood Education: A Meta-Analytic Affirmation of the Short- and Long-Term Benefits of Educational Opportunity," by K. M. Gorey, 2001, School Psychology Quarterly, 16, p. 9-30. Copyright 2001 by the American Psychological Association. Reprinted with permission.*

PERSONAL GAINS

Students who participate in high-quality preschool programs have more stable employment and earn more money in adulthood. This benefits the individuals and their families, of course, but it also benefits the communities in which they live in the form of higher tax revenue. In the High/Scope Perry Preschool study, researchers found that at age 40, 70% of the preschool group was employed, while 50% of the non-preschool group was employed (Schweinhart et al., 2005). Close examinations of Tulsa, Oklahoma's universal pre-K program project significantly increased wages in adulthood (Bartik, Gormley, & Adelstein, 2012).

Bartik's 2014 book, *From Preschool to Prosperity*, focuses solely on this economic benefit of higher wages in adulthood for people who participated in high-quality preschool as children.

In the book, Bartik considers the surprisingly clear link, shown in study after study, between high-quality pre-K and higher adult earnings:

> The evidence suggests that even very time-limited childhood education can have large effects on adult outcomes. This empirical evidence is surprising. Obviously, it can't be that knowing a few more letters and numbers at kindergarten influences adult earnings at age 40 by any direct effect.

How can it be that a relatively short intervention at such a young age can have such consistent benefits so much later in life? Bartik posits:

The child's brain is more malleable prior to age 5 than in later years. Suppose an early childhood program increases the child's skills: cognitive skills such as math and reading skills; social skills such as getting along with peers and teachers; character skills such as patience, persistence, and self-confidence. All of these skills prepare the child for later learning. [...] Early childhood education can develop skills that lead to more skills growth later (2014).

Heckman explains how early childhood education begets more, easier, and better learning later on: "Early learning confers value on acquired skills, which leads to self-reinforcing motivation to learn more, and early mastery of a range of cognitive, social, and emotional competencies makes learning at later ages more efficient and therefore easier and more likely to continue" (Heckman, 2006).

Additional benefits that have been documented in some studies comparing people who attended preschool to those who did not include higher rates of home and car ownership and greater levels of parental involvement in adulthood. The High/Scope Perry Preschool study found that 37% of the preschool group owned their own homes at age 40, compared to 28% of the control group. In the preschool group, 82% of those who had participated owned their own cars compared to 60% of the control group. And 57% of the males in the preschool group played a significant role in raising their own children, compared to 30% for the control group (Schweinhart et al., 2005).

Reduced rates of social service dependence can also be found among the benefits of high-quality pre-K. Gorey's 2001 meta-analysis of 35 studies of the benefits of preschool finds statistically significantly and substantially lower rates of welfare dependence in adulthood for those who attended preschool. In the High/Scope Perry Preschool study, there is also evidence of lower rates of social service use in the preschool group than in the control group (Schweinhart et al., 2005).

A reduced likelihood of criminal behavior and substance abuse are also among the consistent findings in studies of the adult benefits linked to high-quality pre-K participation in childhood. In the High/Scope Perry Preschool study, 55% of the control group had been arrested five or more times by the age of 40, while only 36% of the preschool group met that bleak threshold. In addition, the preschool group had significantly fewer arrests for violent crimes (32% vs. 48%), property crimes (36% vs. 58%), and drug crimes (14% vs. 34%)

(Schweinhart et al. , 2005). Also in the High/Scope Perry Preschool study, far fewer people in the preschool group reported using sedatives, sleeping pills, or tranquilizers (17% vs. 43%), marijuana or hashish (48% vs. 71 %) or heroin (0% vs. 9%) (Schweinhart et al., 2005).

Gorey's meta-analysis finds consistently lower crime rates among those who attended high-quality pre-K when compared to those who did not (Gorey, 2001), and Deming's study of children who participated in Head Start compared to their siblings who did not also shows that the children who participated in the pre-K program had reduced criminal activity as adults (2009).

REDUCED OPPORTUNITY AND PERFORMANCE GAPS

The evidence already cited in this paper reflects decades of research on this question. Robust evidence suggests that high-quality pre-K "provided in a developmentally appropriate program will improve children's early language, literacy, and mathematics skills" (Yoshikawa et al., 2013). The research shows us again and again that high-quality pre-K leads to increases in cognitive development, high school completion rates, stable employment rates, adult income levels, home and car ownership rates, and family involvement in adulthood. It also leads to decreases in special education needs. All of these benefits are realized for our children of color and who live in poverty. Research is mature enough that we can confidently assert that "children have the greatest chance of succeeding in school if they regularly attend a high-quality pre-K program" (Slaby, Loucks & Stelwagon, 2005).

As much as one-half to one-third of the white-black achievement gap already exists when children start first grade (Mead, 2012). Minnesota made tremendous strides in recent years by making universal kindergarten a reality for all families who want it, and this should lead to decreases in the achievement gap. However, we know that high-quality pre-K programs "designed to foster young children's early development and learning to support school readiness can help compensate for the disparities [that lie beneath the achievement gap]" (Mead, 2012). In "Why Pre-K is Critical to Closing the Achievement Gap" (2011), leading researcher W. Steven Barnett and Ellen Frede assert that a high-quality pre-K program can be expected to decrease the achievement gap by between 20 and 30% (Frede & Barnett, 2011). The large-scale studies cited elsewhere here find that high-quality pre-K programs benefit all children, "but have the greatest impact on disadvantaged and minority youngsters, helping to narrow the achievement gaps even as they boost learning for all participants" (Mead, 2012).

When we examine the achievement gap even more discretely, we find that high-quality universal pre-K benefits children across racial and socioeconomic spectrums. Not only does it reduce gaps between racial and socioeconomic groups, but it also benefits children from middle and higher income families, making a universal program the greatest public good.

FIGURE 1: SOCIAL SKILLS OF ENTERING KINDERGARTNERS BY FAMILY INCOME

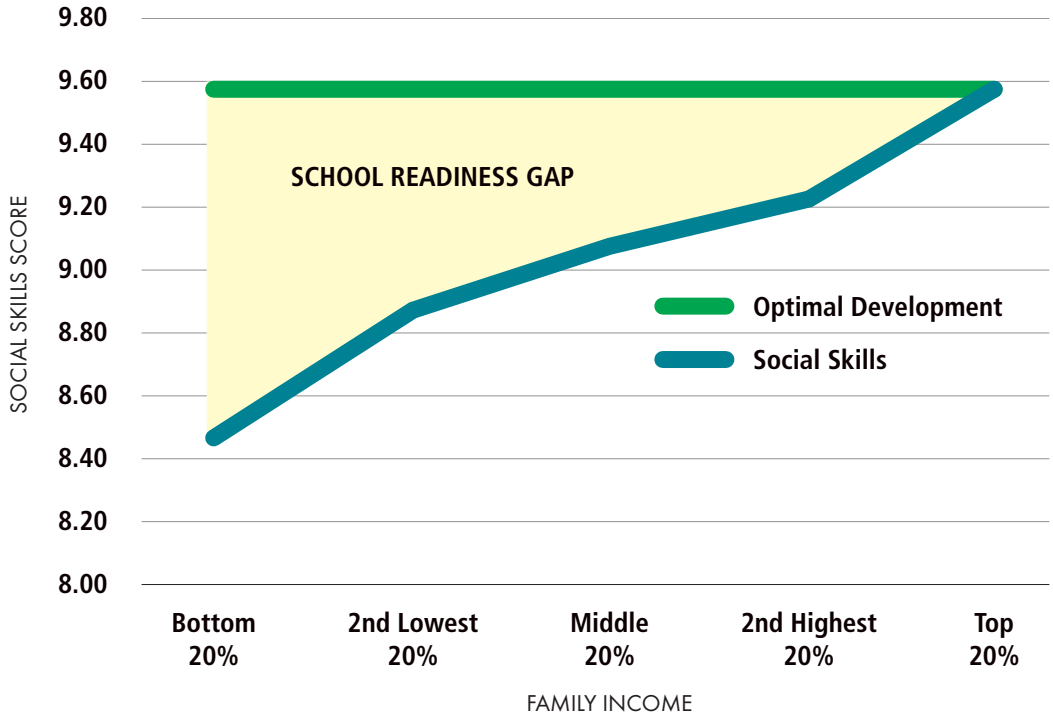


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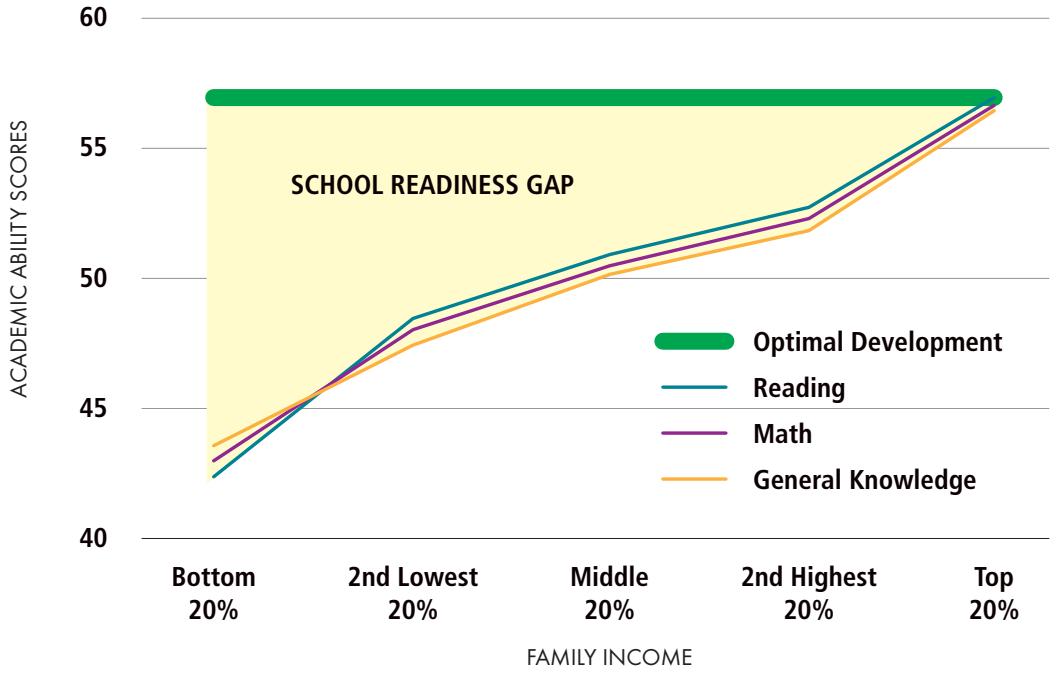
FIGURE 2: ACADEMIC ABILITIES OF ENTERING KINDERGARTNERS BY FAMILY INCOME



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In an article in the collection *Closing the Opportunity Gap, What America Must Do to Give Every Child an Even Chance*, Barnett explains, "The achievement gap is not a discrete gap, but a gradient–a steady decline in children's ability as family income falls" (2013). In fact, while it is well established that children in poverty are far behind children of average income, it is also true that children of median income are far behind those in higher income families. In opposing universal pre-K, a common argument is that it benefits those who do not need it. This is not true: "Not only does the problem of lagging early development afflict many children from low- and middle-income families, but high-quality programs are not available to the vast majority of children" (Barnett & Lamy, 2013).

Elizabeth Hair, Tamara Halle, Elizabeth Terry-Humen, Bridget Lavelle and Julia Calkins offer further support for the need for universal pre-K : "Inadequate progress is not limited to children in poverty. Across the entire income spectrum, nearly 40 percent of American children at age 5 are classified as not ready for kindergarten, and most of these children are not poor" (Hair, et al., 2006).

The second fallacy is the belief that measures of the success of pre-K programs should be limited to standardized tests. Jennifer Rice King of the National Education Policy Center urges that we consider the development of skills and dispositions of students that will allow them to demonstrate civic responsibility, democratic values, cultural competency and awareness,

economic self-sufficiency, and social and economic mobility. She explains that the narrow focus of measuring test scores also distorts the solution to the gaps, limiting it to higher test scores "rather than to broader interventions underlying social economic and educational conditions required for students to thrive in school and beyond" (Rice, 2015). New York University's Yoshikawa confirms the limitations of using only test scores to measure the gaps, noting that these fail to account for "very important long-term effects on things like high school graduation, teenage pregnancy and crime" (Shaw, 2014).

One need look no further than Minnesota's Early Childhood Indicators of Progress to see the map of underlying early learning skills needed to guide learners through the domains of social and emotional development, approaches to learning such as risk-taking, persistence and reflection, language and literacy development, cognitive development and physical and motor development (Early Childhood, 2005). We have so much of this work done and done well here in Minnesota—we know what standards need to be in place. The missing piece is access. Preschool teacher Kimberly Antonsen tells a compelling story of a student, whom we will call T, who overcame stunning odds to succeed in her 4-year-old program last year.

> That was my little T: He was the one who lives with uncle and two brothers. Parents—dad committed suicide and mom was just out of the picture. And uncle did adopt him last year when he was in my class. And that was pretty special thing to be a part of. I always think of him as the kid that...it just isn't fair. Life just has not been fair. But the good thing is that he was very smart. I hope that he stays on that path. He is one who ...when he does do something good, you could just make him beam. (Antonsen, personal communication, October 7, 2015)

Antonsen goes on to explain how she structured activities for T to teach him the social skills necessary to be successful in school. These included learning how to keep his hands to himself and to respect the space of the students, to take turns rather than always rushing to be first. Slowly but surely, with incentives for good behavior and recognition of his natural leadership skills, T succeeded in the 4-year-old class. This year he is in kindergarten at the same school, and Antonsen regularly observes him in the hallway with his new class. "He is doing so great...I'll never forget him," she says.

But because Minnesota does not have universal pre-K, T's little brother will not have the chance to work with Antonsen. He remains on the waiting list for her program. "I was so hoping he could get in here," Antonsen said. "But he didn't. I hope he is at least in one of the Head Starts, or a good day care" (Antonsen, personal communication, October 8, 2015).

Universal pre-K can solve the next piece of the complex puzzle of achievement and opportunity gaps by simply delivering to all 4-year-olds the rich, high-quality education we make available to their 5-year-old counterparts. It ensures access to effective pre-K instruction to all children. Clearly, it is also the best way to ensure that all disadvantaged children have access, including those missed by targeted scholarship programs.

RETURN ON PUBLIC INVESTMENT

Investment in high-quality pre-K more than pays for itself in the long run. Cost-benefit analyses have been conducted on a number of programs with the consistent result that investments in high-quality pre-K yield large economic benefits for the communities in which those programs operate. In fact, the cost benefits for investment in preschool education are much greater than investments made later in the life of the child. As Heckman points out, "[t]he economic return from early interventions is high, and the return from later interventions is lower. Remedial programs in the adolescent and young adult years are much more costly in producing the same level of skill attainment in adulthood" (Heckman, 2006).

There are a number of reasons for the cost savings. First, people who participate in high-quality pre-K programs grow up to earn higher wages, which is good news for them, of course, but which also results in higher tax revenues: "Children who participate in high-quality early childhood education will tend to have higher earnings as adults, because these programs help unlock the child's potential for skills development" (Bartik, 2014). In addition to higher tax revenues, however, are savings that stem from the benefits discussed earlier, chief among them lower costs related to crime, welfare dependence, and substance abuse.

Bartik (2014) examines the evidence for higher wages and subsequent higher tax revenues across many states and several decades. He calculates earnings gains for participants of high-quality pre-K at 10% for children from low-income families and 5% for children from middle-income families.

As Bartik points out, before we look at specific cost-benefit ratios, it is important to understand a few points about what the numbers mean. Legislators and other stakeholders often seek simple ratios to use when advocating for the expansion of pre-K programming. But it is not quite as simple as saying that there is a $7-to-$1, or a $3:$1, or a $26:$1 ratio of cost savings for all pre-K programs.

Two factors must be taken into consideration before ratios make sense. First, we need to understand that the cost savings multiply over time as pre-K participants age. It makes a difference whether we are asking how much communities save relative to their investments when the participants are 10 years old or when they are 40. When participants are 10, communities have saved some dollars because there are, for example, lower retention and special education needs. When participants are 40, however, communities will have saved much more because in addition to the savings realized during the formal education process, they are also realizing savings due to decreases in criminality, dependence on social services and substance abuse services, and they have realized higher tax revenue due to increases in wages.

Second, we need to understand that not all pre-K programs provide an equally enriching experience for their students, and the quality of the program matters a great deal if we are looking for a greater cost-benefit ratio. As Barnett and Masse (2007) and Heckman (2011) point out, the quality of the programming has everything to do with its cost benefit. Intensive, well-designed programs "have generated benefits 10 times greater than their costs

whereas poorly designed programs may not even return their costs" (Heckman, 2011). We must remember the pitfalls of large-scale, low-quality pre-K programs, such as Tennessee's Voluntary Pre-K program, which is yielding no measurable benefit. It is simply not honest to say that any universal pre-K program will lead to dramatic economic savings for Minnesota. It is, however, quite apparent that pre-K programs that reflect best practices for benchmarks of high-quality do in fact lead to significant economic benefits. Essential components of high-quality pre-K programs are discussed later in this paper, but it is important to note here that great economic benefits to the public are realized only when we look at high-quality programs.

TABLE 2. HOW EARNINGS BENEFITS OF PRE-K PER CHILD VARY FOR CHILDREN FROM DIFFERENT INCOME GROUPS

	Earnings gains versus baseline earnings for a child from a	
	Low-income family	*Middle-income family*
Gains from pre-K	*$53,000*	*$48,000*
Baseline earnings	*$547,000*	*$997,000*
Percentage gain	*110%*	*5%*

Note: Gains and baseline earnings are rounded to the nearest thousand, in present-value 2012 dollars. Baseline earnings are the present value of total career earnings without pre-K. Earnings and gains are average per child for program participants. SOURCE: Author's calculations, as described in text and endnotes. From Preschool to Prosperity: The Economic Payoff to Early Childhood Education *(p. 47), by T. J. Bartik, 2014, Kalamazoo, MI: The Upjohn Institute for Employment Research. Copyright 2014 by Timothy J. Bartik. Reprinted with permission.*

The most extensive analysis on the cost benefit of pre-K comes from the High/Scope Perry Preschool Program. This program gives us the most thorough analysis because the participants are over 40 years old, so researchers have had several decades of evidence to work with. And the research shows benefits that substantially outweigh costs. At the age 19 follow-up, the ratio of benefits to costs was $6.87 per $1 invested. At the age 27 follow-up, the ratio of benefits to costs was $8.74 per $1 invested and at the age 40 follow-up, the benefit had increased to a return of $16.14 per $1 of investment (Reynolds et al., 2011).

A cost-benefit analysis of Chicago's Child-Parent Centers considers both benefits that are measurable at age 26 and benefits that are projected through adulthood (age 65) on the basis of strongly predicted measures (Reynolds et al., 2011). When researchers exclude earnings and participant benefits, they find a ratio of public benefits to be $7.20 to each $1 invested. The researchers break down where the economic benefit is realized: "Crime savings were by far the largest category, representing 69% [of the total public benefit]. Income tax revenues (10%), special education (9%), and child welfare (5%) also contributed substantial percentages to public returns (Reynolds et al., 2011).

There is no mechanism by which we can accurately estimate the cost benefit to Minnesota's investment in universal pre-K, because so much depends on the quality of the programming Minnesota puts in place. But we do know that public investment in high-quality education for universally available pre-K in Minnesota will pay large economic dividends.

WHAT DEBATE STILL EXISTS?

Some researchers take issue with the findings that show high-quality preschool leads to significant benefits for both the children who participate and for the communities in which they live. The stakeholders who continue to maintain that there is no value in any state-funded pre-K programs assert that the benefits of pre-K diminish over time, leading to no benefit in the long run. They rely on two cases to support their assertion—a Head Start Impact Study released in October 2012, and two studies of Tennessee's relatively new pre-K program.

The 2012 Head Start Impact Study estimated that test score benefits "decline by third grade such that they are insignificantly different from zero" (Bartik, 2014). Indeed we do have

evidence that specific pre-K benefits to some test scores diminish throughout elementary school such that they eventually converge with the scores of students who did not attend preschool (Yoshikawa, 2013). But even in many cases where we see test scores converge with non-preschool control groups, we can still point to lasting benefits in other areas (Bartik, 2014). These findings suggest that using standardized test scores alone is an insufficient measure of the achievement gap, but they also rebut the argument made by many legislators that if test scores converge, there is no reason for states to invest in pre-K.

As we compare the results of various early childhood programs, it is essential from the outset to understand how Head Start programs differ from universal pre-K. While Head Start provides young children with many benefits, it is not a comprehensive program consistently aligned with the academic goals and curricula of kindergarten, and it is not staffed with consistently highly-qualified teachers. Students who participate in Head Start realize gains not matched by students who do not participate in preschool at all. But those results do not compare favorably with those attained by students who attend high-quality pre-K programs. Head Start programs are not as focused on academic results as those of other high-quality pre-K programs, partly because they are intended to achieve other goals, like improving public health (Bartik, 2013).

To look at the results of these studies and conclude that there is no benefit in preschool programs, however, misses the much broader picture drawn by a far more substantial body of literature. In some cases where we see the test scores of children who participated in pre-K programs converging with the scores of their peers who did not participate in preschool, we can still show other, significant, lifelong benefits. The Head Start children whose test scores converge with their control group nevertheless complete more years of schooling, earn more, live healthier lives, are less likely to commit crimes, and if they do commit crimes, are less likely to commit violent crimes (Yoshikawa, 2013; Deming, 2009; Gorey, 2001; Schweinhart, 1994).

One large-scale meta-analysis, "Meta-Analysis of the Effects of Early Education Interventions on Cognitive and Social Development," published in 2013, examines the rich body of evidence available on the lasting benefits of pre-K education and closes the door on arguments that the benefits of pre-K fade. The analysis, conducted by Gregory Camilli at the University of Colorado and Sadako Vargas, Sharon Ryan, and W. Steven Barnett at Rutgers, The State University of New Jersey, examines 123 comparative studies of early childhood interventions and concludes that "preschool intervention programs provide a real and enduring benefit to children" (Camilli et al., 2013). Barnett, co-director of the National Institute for Early Education Research, asserts that this study "provides an objective summary of all of the research on preschool education's effects" and "finds substantial positive effects on achievement, special education, grade retention, and social behavior at ages 10 and higher" ("Long-Term," 2015).

In addition to the consensus that pre-K benefits long-term academic achievement, there are significant additional benefits to universal pre-K. Heckman asserts that critics who focus only on test scores miss the much larger picture. Head Start, he explains, was deemed a failure in

the 1960s because it did not raise the intelligence quotients of its participants. Yet when we look at children for whom some types of test scores converge with those of peers who did not attend preschool, the preschool group performs better.

The other case often cited by detractors of state-sponsored pre-K is Tennessee. Tennessee presents an example of a pre-K program that is yielding questionable results. Tennessee's voluntary pre-K program provides programming for 4-year-olds and gives first priority to those most at risk. Currently it serves roughly 18,000 children, most of whom come from low-income families. Two studies have now shown the program to be ineffective, such that researchers cannot identify substantial benefits to the group of students who had access to the program when they are compared to those who did not. And these studies should serve as a warning to those contemplating the design of Minnesota's pre-K system. Not all pre-K programs are equal in quality, and when states fail to fund programs adequately or fail to insist on quality benchmarks systemwide, all potential benefits will inevitably and unsurprisingly decline.

An early study of Tennessee's program caused one writer in the *Wall Street Journal* to declare the program's outcomes to be "devastating for advocates of the expansion of state pre-K programs" (Lipsey et al., 2013). More recently, researchers at Vanderbilt University published a study that followed both the preschool children and their non-preschool peers. This study, too, finds no lasting benefits for the children who attended Tennessee's preschool program. But to look to Tennessee and draw conclusions about the effectiveness of high-quality pre-K is nonsensical. In short, Tennessee's pre-K program does not meet critical benchmarks for high-quality programming, and it is not surprising at all that its results are so dismal. When Tennessee scaled its program up to more than 900 classrooms, it failed to create any centralized curricular standards to make sure teachers were following best practices, and it dramatically underfunded the program (Turner, 2015). As Barnett explains, "If your program isn't very good, you can't expect it to have long-term impact on kids" (qtd. in Turner, 2015).

Some opponents of state spending on pre-K education point to these studies and draw the overly-broad and self-serving conclusion that because Tennessee's program is not leading to lasting benefits, any state-level pre-K program is a waste of tax dollars. Such conclusions are simply wrong. What Tennessee's program results should tell us is that compromising quality by failing to put quality benchmarks and standards in place systemwide or by underfunding a program leads very quickly to a system that fails.

There is ample evidence to suggest that poor-quality pre-K yields poor results, whether we look at cognitive and academic achievement, cost-to-benefit ratios, or benefits that last into adulthood. The lead researcher for the Vanderbilt study of Tennessee's program, Dale Farran, asserts that her study "is not a failing grade for all preschool: [That's] like saying spinach is really good for you, but we can't afford spinach. But here, I've got this Easter grass. Maybe that will be just as good" (qtd. in Turner, 2015). The Vanderbilt study confirms our assertion that Minnesota's investment in pre-K must be bold enough to build a high-quality program from the outset. Recent work in Boston verifies the need for quality in preschool settings.

The value of well-trained teachers, aligned curricula, and the appropriate physical learning environment cannot be overstated (Sachs & Weiland, 2010). Consistent, verifiable results are only realized when programs are of high quality (Shaw, 2014).

WHY NOT TARGET THOSE WHO NEED IT THE MOST?

In debates about how states should structure their pre-K programs, many stakeholders assert that programs targeted at and limited to the most at-risk children are the best and most efficient use of scarce state funds (Barnett, Brown & Shore, 2004). There is ample evidence that some targeted programs, such as the federal program Head Start, do indeed provide benefits for the children who are able to participate. Therefore, an approach that is targeted only to those who need it the most and disrupts no other extant services seems desirable to many.

Proponents of targeted programs cite cost savings, as it is cheaper to provide services for a smaller group of children. But this view misses three salient points: 1) targeted programs fail to reach many of the children who need them the most; 2) the most at-risk students benefit more from universal programs than they do from targeted programs; and 3) targeted programs do not yield as high a return rate for local economies as do universal programs. When we examine the evidence for these three points, the assertion that targeted programs are the most efficient use of funds is so undermined, in fact, that it does not hold up. While it might be the case that a state may decide not to invest in pre-K to the degree necessary to make a significant difference in the achievement and opportunity gap, it is simply not true that programs limited to families under specific income thresholds are the most cost-effective way to close that gap.

First, we look at the reasons targeted programs so often fail to reach many of the children most in need. One of the endemic problems with targeted programs has to do with the fact that poverty is transitory (Barnett et al., 2004). Eligibility thresholds tied to family income are usually linked to the federal poverty line. But as family incomes go over and under those thresholds, children's educational experiences are often interrupted or never undertaken. Students who begin a school year eligible for a targeted program are often suddenly no longer eligible sometime during that year. Other children may have a family income that makes them ineligible at the start of a school year, but their family income may reach the eligibility threshold during that year. In many cases, these students miss the opportunity to participate altogether.

The problem of students fluidly landing above and below eligibility thresholds reflects only part of the reason targeted programs are not reaching their intended audience. Many families who would be eligible are unwilling or unable to attempt to navigate the bureaucratic process necessary for determining eligibility and so never apply or never complete the application process in the first place. In addition, many targeted programs, including Minnesota's scholarship program, offer scholarships to eligible families that cover only a certain percentage of the overall cost of participation, leading to even more families who may meet eligibility requirements but be unable to participate in the program.

An additional problem with using family income to determine eligibility is that any established threshold automatically cuts off children who need the services. Eligibility thresholds tied to family income are necessary for determining which families can participate and which families cannot, but any chosen threshold is arbitrary. There is no point on the scale of family incomes at which children stop needing the benefits of high-quality pre-K. Many low-income children stand to benefit from high-quality pre-K, but so do many middle-income children. As Schulman and Barnett (2005) point out, "research shows that the need for high-quality preschool education does not stop at the eligibility limits for targeted preschool programs. Rather, it proceeds on a continuum up the income scale."

We are able to measure the impacts of high-quality preschool education on specific and diverse groups of children, both in terms of race and in terms of family income, and we can show two things: Children of color and children from the most economically disadvantaged families experience the most dramatic benefits; and children of all backgrounds stand to benefit substantially. Extensive examinations of data from Tulsa, Oklahoma's pre-K program show moderate to large effects for all racial and ethnic groups studied (white, black, Hispanic, Native American), with especially large effect sizes for Hispanics (Gormley et al., 2005). Although early research focused only on programs for low-income children, more recent research examines impacts to a broader range of children from more diverse economic backgrounds. As Yoshikawa points out, "the evidence is clear that middle-class children can benefit substantially, [...], however, children from low-income backgrounds benefit more" (2013).

Universal pre-K offers significant additional benefits not matched by targeted programs. These include improved literacy for all students (Sachs & Weiland, 2010) as well as improved access to high-quality instruction for children from low and middle-income families. Recent work in Boston that confirms the benefits of universal pre-K, highlighting the benefits for all children in mixed-income classrooms and noting that students learn from their peers as well as from their teachers. If their only classmates are students from similar backgrounds, the children do not experience this learning (Sachs & Weiland, 2010).

If our only tool is a set of programs targeted to the most economically disadvantaged, we miss huge swaths of the population that would reap tremendous benefits from access to high-quality preschool.

During Minnesota's 2015 legislative session, lawmakers agreed to put additional funds into targeted programs in the form of preschool scholarships rather than to invest in universal pre-K. They raised the appropriation for scholarships from $27 million to $44 million, and they increased the maximum amount of an individual scholarship from $5,000 to $7,500. This will surely be welcome news to some eligible families struggling to pay for preschool.

The downside to the legislation, however, is that the total budget set aside for the scholarships means that even fewer families will see any funds at all. Current projections show that instead of the already meager number of 6,400 families who received scholarships in 2014 year, only 5,700 would receive them last year (Magan, 2015). To put those numbers in

perspective, according to the United States Census Bureau American Community Survey, 14.9% or 188,000 of Minnesota's children live in poverty, up from 10% in 2013 ("12,000 More Minnesota Children," 2015). Among them are 69,000 children under the age of 6, of whom 31,000 live in extreme poverty. (Children's Defense Fund.) Given how few families will benefit from the increase in scholarship funds, the action taken by the Minnesota Legislature in 2015 to improve pre-K for Minnesota families will make very little difference in the long run.

A pattern emerging from the research on universal pre-K is that the benefits we can measure in universal programs are far greater than those associated with targeted programs. It is important to note that we do not have a deep well of studies that can compare groups of students in a universal program to otherwise like groups in a targeted program. We do have some, though, and they reach conclusions that are not too surprising given the known shortcomings of targeted programs. Although the studies vary in the questions they consider, the tools they use to measure results, the student populations they study and the components and quality of the programs themselves, clear patterns emerge. They point to great benefits for all children who participate in universal preschool programs. For those students who are the most disadvantaged, the difference is most acute.

The state programming in Oklahoma allows us the opportunity to compare outcomes of a targeted program to those of a universal program. Oklahoma's universal pre-K program runs concurrently with Head Start programs, allowing researchers to examine benefits of each group. In a study conducted by William T. Gormley of the Georgetown Public Policy Institute and Center for Research on Children and the United States, benefits were significant in both groups, but were notably higher among children who attended universal pre-K. For example, universal pre-K led to effect sizes of 0.985 for letter-word identification and 0.743 for spelling. The Tulsa Head Start program effect sizes were 0.514 for letter-word identification and 0.334 for spelling. Effect sizes for math were similar (Gormley et al., 2008).

Michigan State researcher Christina Weiland cites recently reported results from Boston's highly-regarded universal pre-K program that show that program had the best results of any in reading and math (Shaw, 2014). Universal pre-K offers significant additional benefits not matched by targeted programs. These include improved literacy for all students (Sachs & Weiland, 2010) as well as improved access to high-quality instruction for children from low- and middle-income families.

We know that targeted programs vary wildly in terms of quality, which calls into question their ability to educate equitably. Given our understanding of the critical role pre-K plays in the life of a child, it is especially concerning that the quality of pre-K programming varies as widely as it does, and that those with the least access to high-quality programming are those who need it the most. In 2005, a nationwide study of the quality of pre-K programs found most programs to be of low quality and that the quality of the programs was lowest for children whose parents have the lowest incomes and education (Barnett & Nores, 2013). Universal pre-K offers a better and far more equitable alternative.

Researchers have spent some time exploring the reasons for the increase in benefits with universal programs compared to the benefits of targeted programs. The general answer is twofold: Universal programs are open to all and they have higher, more consistent standards. These two characteristics are of equal importance. A program open to all avoids problems associated with determining each child's eligibility by fluctuating family income levels, thereby avoiding the alarming yet persistent problem of locking out children deeply in need of the service. Equally, a program that is universal statewide can be held to consistent and high standards in every corner of the state.

HIGH-QUALITY STANDARDS

What are the characteristics of high-quality pre-K programming? What kinds of programs produced the overwhelmingly positive outcomes described earlier in this paper, such as increases in cognitive and academic achievement, high school graduation rates and adult earnings? How can Minnesota build a universally-available program throughout the state and still ensure quality programming for Minnesota's children? Minnesota cannot simply adopt full-scale a program developed elsewhere and hope for the same results. Every state-sponsored pre-K program is different, and each program yields different results. But what Minnesota can do and should do is examine the shared characteristics of the programs that are the most successful. These include:

- Universal access
- Licensed early childhood teachers
- Programs run as public school offerings
- Curriculum aligned with the Minnesota Early Childhood Indicators of Progress
- Class size capped at 20 and student/staff ratios capped at 10:1
- Vision, hearing, and health screening and referral
- Family outreach and wrap-around services

We have already discussed the importance of universal access at length, but the other characteristics listed here are critical components of high-quality systems and therefore deserve discussion.

LICENSED TEACHERS

One of the most critical characteristics of high-quality pre-K is a requirement that instruction is undertaken by highly qualified, licensed early childhood teachers. Early childhood is a unique period for social, cognitive, and emotional development. Successful educators are those who have the rigorous academic and clinical background are, therefore, better equipped with necessary tools. They have access to pedagogical resources, they are steeped in the latest research and they belong to networks that allow them to stay updated as new research evolves. As Santiago Pickett explains:

> We are teaching [4-year-olds] to be aware of themselves and others, of how they learn

> as individuals and how they learn as a group. It's not about being a child whisperer or being "good with kids." It's far more than that. It's about understanding child development, how a brain develops. Early childhood teachers need tools, knowledge, practice, and pedagogy, and methodology. (Santiago Pickett, personal communication, October 3, 2015)

Research has pointed to strong teacher qualifications as being one of the defining characteristics of high-quality pre-K programming. Oklahoma's pre-K program, for example, stands apart from that state's Head Start in quality due in large part to its insistence on strong teacher qualifications. Only 60% of Head Start teachers nationwide hold college degrees, and in child care centers, that number is often much lower (Gormley et al., 2005). Given what we now know about how critical these years are in terms of children's brain development, it is nonsensical to assert that we should provide lesser-prepared teachers for the young children who are in the most formative stage of their lives.

Lacey Smith teaches kindergarten in Grand Marais, Minnesota. She describes how young learners' play is structured around academic standards: "The standard might be to memorize coins. And a room might have a little farm stand play area, and the kids go around and put a pear, or maybe some grapes into their baskets, and they go to the cash register that has coins, and they count their coins. It's an authentic reason to use the money; they are identifying money; they are counting it. It is play, but it is specifically structured play that targets their academic or social and emotional growth based on what we know is happening for them developmentally" (Smith, L., Personal Communication, October 15, 2015). We know that high-quality pre-K programs depend in large part on the high qualifications of the professionals who teach in them.

In addition, both administrators and paraprofessionals working with pre-K programs need to have the skills and understanding to effectively support early childhood education. The most effective preschool programs also provide classroom observation linked to coaching and professional development for teachers (Barnett & Carolan, 2013, Best & Cohen, 2013, Chien et al, 2015).

RUN THROUGH THE PUBLIC SCHOOLS

One element of a program that can ensure equity across great numbers is that it has centralized oversight. In some states, such as New York and Georgia, pre-K programs are run through a variety of entities. In Georgia, 57% of the publically funded pre-K programs are run by private operators, such as for-profit and nonprofit day care centers (Gormley et al., 2005). Such an arrangement might be politically expedient at the outset, but it almost guarantees that standards throughout the state will vary wildly. A program that has statewide coordinated governance and a centralized system is the most logical way to set and maintain high standards (Best & Cohen, 2013). Additionally, the public school system is already set up to provide ongoing professional development, so that teachers can stay informed and up to date on best practices and new research in this complex and ever-evolving field. Recent work

in Boston validates the finding that well-aligned programs staffed by licensed teachers deliver consistent results (Shaw, 2014).

ALIGNED WITH MINNESOTA EARLY CHILDHOOD INDICATORS OF PROGRESS

A unique pedagogy is necessary for effective early childhood education. Minnesota has adopted and implemented Early Childhood Indicators of Progress, standards that align with those of the K-12 system, and these standards should be the cornerstone of the state's pre-K system. Program design should be based on the fundamental understanding that play is essential for children's health and well-being, and that it is critical for academic success. A comprehensive program will include but not be limited to fine motor development, gross motor development, music, art, social studies, emerging reading, dramatic play, inquiry-based science and math, and social and emotional development (Early Childhood, 2005). An additional benefit to having a statewide, unified curriculum is that it becomes much easier to provide effective, scalable, cost-effective professional development.

The research consistently shows that a combination of teacher-directed and student-initiated activities, including dramatic play, provides gains in cognitive and social-emotional development. Effective programs adhere to national standards for physical well-being and motor development, approaches toward learning, language development and cognition and general knowledge (Barnett & Carolan, 2013).

The current version of Minnesota's Early Childhood Indicators of Progress (now under revision) aligns with national standards by including:

- Approaches to learning: curiosity, risk-taking, imagination and invention, persistence and reflection and interpretation
- Language and literacy development: listening speaking, emergent reading and emergent writing
- Creativity and the arts: creating, responding and evaluation
- Cognitive development: mathematical and logical thinking (including number concepts and operations, patterns and relationships, spatial relationships and geometry, measurement and mathematical reasoning); scientific thinking and problem-solving (observing, questioning, investigating); and social systems understanding (human relationships and understanding the world) and
- Physical and motor development (gross motor development, fine motor development and physical health and well-being)

Minnesota standards are based on widely-accepted developmental expectations for children of approximately 4 years of age and receive high rankings nationally.

CLASS SIZE AND STAFF/STUDENT RATIOS

Class sizes and student-teacher ratios must fall within recommended guidelines. National standards set a class size limit of 20 students, and a staff-to-student ratio of 1:10. (Barnett

& Carolan, 2013). In its national quality standards checklist, the National Institute for Early Education Research benchmarks also requires maximum class size of 20 or fewer, and staff-child ratios of 1:10 or better.

FAMILY OUTREACH AND WRAP-AROUND SERVICES, INCLUDING VISION, HEARING, AND HEALTH SCREENING

Supporting children within the context of family and community is best practice for early childhood programs. Katy Smith, a parent educator in Winona, Minnesota, explains: "It's not enough to send a child to preschool and call it good. When you bring a family into preschool, you have an opportunity to change the trajectory of how a family feels about school, about education, about reading, about the important role that they play. Having parents partner with teachers really helps compound our investment, because parents can learn early how they can support their growing readers" (Smith, K. personal communication, October 15, 2015). A high level of family involvement is essential; wrap-around services bring parents in to get needed services for their families; in this way they involve the families in their children's education and open the door for parent education ("The Early Childhood," 2005). We know that one of the great benefits of pre-K programs is that children with needs get identified earlier, allowing educators and parents to work together to get the appropriate supports in place so that students are allowed to flourish and grow as much and as quickly as possible.

Janet Kujat, kindergarten teacher in the Minneapolis Public Schools, talks about the importance of family outreach. She does home visits in order to meet and create relationships with the parents of the children in her classes. In those visits, she invites the parents into partnership with her, so that they can create a team that will be most supportive of the child's academic success. During those visits, she gives the parents a list of activities they can complete at home that will help the child succeed, such as "practice writing name," "watch for pencil grip and scissor hold," "practice sight words," and "practice counting to 100." A lot of these are skills they would have tackled in pre-K , and Kujat explains what a difference it would make if those same kids had access to pre-K: "Imagine if they had pre-K. They would have accomplished so much that I wouldn't have to work with them on pencil grip." But she also wonders what a remarkable difference it would make for parents who do not know how to support their children academically to have the ability to develop a relationship with an educator when their child is 4 years old rather than waiting until the child shows up in kindergarten.

> I had a kindergarten student last year named T. T is the youngest of many siblings, and he is being raised by a 72-year-old grandmother who is in poor health. It was clear when he got here that nobody had ever read to him, but it was worse than that. He had been fed and clothed, but that was about it. Mostly he had been parked in front of a television. A relative told me that almost nobody even talked to him—ever. He didn't even recognize his own name.

> We spent most of his kindergarten year teaching him how to be around other children, how to hold a pencil, how to sit with a group and how to write his name. And we spent a lot of time trying to identify his special education needs. But that takes a lot of time. Had all of that been done in a pre-K setting, he would not be so very far behind or so very overwhelmed. And we would have had a chance to work with his grandmother to show her how to support his development (Kujat, personal communication, October 5, 2015).

The achievement gap has many root causes, and one of them involves parents who did not have a good experience with schools and who therefore do not trust schools. With family outreach embedded into pre-K, "we will have this fresh new opportunity for parents to rethink how they feel about schools when they send their young children there. If we can build a trusting relationship with them, if we can remind them that we love their kid, that we're crazy about 4-year-olds, we also help them calm down and feel better about coming to school, too" (Smith, K., personal communication, October 15, 2015).

Having family outreach services that include vision, hearing and health screenings will allow Minnesota's school districts to build better relationships with families and to identify barriers to learning earlier, making it far more likely that the children can show up for kindergarten ready to learn.

High-quality standards are critical for Minnesota's pre-K future. Minnesota's kids deserve universal access, programming run through the public schools and aligned with K-12 curriculum, licensed teachers, reasonable class sizes, and outreach services.

V. The Space Issue

We recognize that one of the barriers to a universal pre-K program in Minnesota has to with concerns about facilities. Having never made space available for 4-year-olds before, and having only recently made room for kindergarteners in many parts of the state, many school districts believe they don't have space to handle an influx of new students. In addition, appropriate spaces for high-quality pre-K are not just empty spaces and are not identical to K-12 classrooms. As Carl Sussman and Amy Gillman point out, "well-designed facilities enhance child development and program quality. Young children learn though play and by exploring and interacting with their environment, both social and physical. They need classrooms [...] specifically designed for active learning" (Sussman & Gillman, 2007).

Clearly, in the long term, Minnesota's education funding will have to include considerations for the infrastructure necessary to maintain space for appropriate learning environments for all of its public school students. In addition, there are a number of federal programs that provide incentives for expansion of pre-K at the state level. Last year, the United States Department of Education awarded five states development grants and an additional 13 states expansion grants. These grants are intended to help states extend pre-K programing to more moderate-income families ("18 States," 2015). And just last year, the American Federation of Teachers, Amalgamated Bank, and the National League of Cities announced the establishment of the Early Childhood Expansion Infrastructure Fund, which will provide loans for the renovation of existing spaces and the building of new spaces for pre-K programming.

As we see in many of the states that have instituted universal pre-K programs, it is possible for districts that lack physical space to partner with other agencies in their communities. We propose Minnesota school districts be given two options for delivering pre-K programming capable of accommodating all families that opt in:

a. School sites with school district, licensed teachers

b. Community sites with school district, licensed teachers

Districts in Wisconsin, Illinois, Louisiana, New York, and Massachusetts have formed partnerships that allow them use of available spaces in local churches, for-profit and nonprofit day care centers, empty malls, libraries, and community centers.

There are two types of community sites that require different types of partnering. Districts can partner with for-profit and nonprofit child care or preschool centers already in their communities. These centers already meet the standards of the National Association for the Education of Young Children. When such partnerships are not possible, districts can seek out other facilities in their communities that might be renovated to serve the need.

As we've seen in Oklahoma, partnerships between districts and for-profit and nonprofit preschools can be highly beneficial for both parties. In the case of Oklahoma, when the district lacks sufficient space, it contracts with a private early learning center that must have achieved a three-star rating in the state's Quality Rating & Improvement System (QRIS). The

district sends a licensed teacher and an early childhood paraprofessional to the preschool to teach in the state-sponsored universal pre-K program offered at that site. They use the same curriculum their colleagues working at district sites use. Students are enrolled in the district but attend at the center. The site does not pay the salary for the school district employees, but nevertheless benefits tremendously from some of the resources brought in by the public schools. The presence of a licensed teacher opens up a wide variety of opportunities for professional development for the preschool staff in the way of mentoring and shadowing. And services such as screenings made available by the public school system can benefit centers, too.

New York City Mayor Bill De Blasio has introduced a plan to provide universal pre-K programming to more than 73,000 4-year-olds, and school buildings in the city have very limited available space. In many cases, private centers partner with districts to provide pre-K, but even with those partnerships, the city was still pressed for space. So the city is turning to other partners in the community to identify and convert available spaces elsewhere into pre-K classrooms. Public libraries were heavily involved in planning efforts, as were the departments of education, buildings, and mental hygiene. Nick Buron, Queens Library vice president for public library services, explains why so many stakeholders were willing to work across the lines of huge bureaucratic departments: "We didn't just want to have a program. We wanted to have a great program" (qtd. in Jacobson, 2015).

Identifying potential community spaces for pre-K and converting those spaces into appropriate learning spaces are, of course, two different steps. Capital improvements at such sites are often needed to meet licensing standards required for early-childhood programs. New York City pulled together some important voices to get the best creative thinking around how to make the most of potential pre-K spaces in their community:

> The New York chapter of the American Institute of Architects and the New York City Department of Design and Construction co-sponsored an event—called a charrette—in which representatives from city agencies, nonprofit organizations, and library systems brainstormed how to meet the design challenges faced by turning spaces traditionally used by adults into preschool classrooms. Other sites being recruited include homeless shelters, public housing buildings. (Jacobson, 2015)

The space shortage has been a concern for almost every state and city that has tackled the issue of universal pre-K. It has not stopped them from moving ahead creatively and boldly. Neither should it stop Minnesota from providing high-quality pre-K for our 4-year-olds.

VI. Conclusion

It is time to implement high-quality universal pre-K for all Minnesota families. We cannot continue to despair about achievement and opportunity gaps while ignoring the overwhelming evidence that pre-K can diminish those gaps. Minnesota has already done the work of establishing what high-quality means. What Minnesota has not yet done, however, is put forth the political resources to make what we know is possible a reality.

Minnesota ranks well among the states for its standards for high-quality pre-K. Clearly our early education community holds the knowledge and expertise necessary to deliver high-quality pre-K education to our youngest learners. But the latest rankings by the National Institute for Early Education Research point out quite clearly that our weakness is the lack of access for our 4-year-olds. Forty other states do a better job of making high-quality pre-K accessible to all learners (Barnett, et al., 2015).

Universal pre-K for 4-year-olds will not solve all of Minnesota's problems around inequity. Addressing the needs of even younger Minnesotans is also critical–good nutrition, the safety and security of stable housing, job security for families, all of these are necessary for children to be able to grow and learn. We would join advocates for the health and safety of Minnesotans from birth-3 in achieving those ends. Universal pre-K for 4-year-olds is not antithetical to those goals, but rather is another piece in the complex puzzle of addressing inequities. And it is a piece that Minnesota can and should put in place.

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