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# Foundation for Life:

The Significance of Birth to Three





Every parent wants the best for his or her child. Scarcely a moment passes that a parent is not thinking about the health and well-being of that new life. Yet no parent can fully control the course of a child's life, as there are inherent aptitudes, personalities and external factors that contribute to this trajectory. Nevertheless, as parents and caregivers, we do what we can to nurture our children, and to remove the barriers that may prevent a child from achieving his or her full potential.

This unifying parental drive knows no age, cultural, racial or socioeconomic boundaries. Unfortunately, life circumstances do. So while every parent wants to create the best opportunity possible, many children face obstacles that limit their potential. Understanding this fact, we can either accept the existence of opportunity gaps or take steps that optimize every child's full potential.

At Children's Hospitals and Clinics of Minnesota, we believe the stakes are too high and the opportunity too great not to embrace a shared community responsibility to provide children with the support we know they need: food, safety, access to health and educational resources, and freedom from bias, prejudice, and the crippling effects of poverty. In fact, it's the least we can do. Building on basic human needs, we can also find creative ways to ensure that every child and family have support from other caregivers who create and enhance the positive relationships children need in those early years.

There is an avalanche of scientific evidence about brain development that validates a focus on these earliest years of a child's life as a way to drive better outcomes. This is such an important time in a child's life, and yet the systems to support children are inconsistent until kindergarten. That needs to change. It is not an overstatement to say that these formative years — from the time a child is born to age three — can determine a lifetime of health and well-being. Just as unhealthy development in these years has an impact for years to come, healthy development reaps benefits over a lifetime for that child and society.

At Children's, we're taking a new look at our role in healthy early childhood development as part of a long-term strategy to improve the health of children throughout our communities. While we will always treat children who are stricken with acute illness, we also know that the major influences on health and well-being occur mostly outside of the health care setting. This new commitment is a critical part of our mission.

In an effort to ground new members of the Children's team in our fundamental mission, I often share my personal and professional perspective that the day you first become a parent, all your priorities change — that moment triggers an unflinching and uncompromising focus on our charge over the youngest human life, with a world of opportunity ahead. Through this work on healthy early childhood development, we hope to infuse our discussions with that sense of commitment and hope. There is magic to be made in these years if we go all in for every one of these kids.

A handwritten signature in black ink, appearing to read "Alan Goldbloom". The signature is fluid and cursive.

**Alan Goldbloom, MD**  
**Chief Executive Officer, Children's Hospitals and Clinics of Minnesota**

## Introduction

As we consider the ever-growing body of research that identifies the birth-to-three window as a critical time for development, we are well served in connecting this research back to what we see and hear in our communities every day. Minnesota is home to many communities, a term that we hesitate to define here because it may include relationships within the context of geography, culture, class, identity and more. However, we do know that our communities often face similar challenges, even as they might be experienced and solved in unique and personally or culturally responsive ways. Our intent in this paper is to explore some of the environmental factors that can negatively impact early childhood development and equally to explore the power of strong, responsive and caring relationships between children, their caregivers, family and the community networks that protect them.



We explore this body of work with recognition that the environmental factors we confront today are the product of historical, social, political and cultural circumstances. While we can't do these complex circumstances justice in this paper, we know they have shaped and continue to impact the ways in which our communities experience all of the stressors we explore in relation to healthy early childhood development.

Our hope is that with this new commitment Children's is empowered to work together with community partners to deepen our understanding of the interrelated factors that shape development early in life and pursue solutions that honor the lives, needs and values of all the children who call Minnesota home.

## METHODOLOGY

**This paper is the result of a comprehensive, cross-disciplinary, multi-sourced effort. It is informed by academic research on pediatric neuroscience by, among others, researchers at Harvard University's Center on the Developing Child. It considers practical investigations into early childhood development by NORC at the University of Chicago, Harvard University's Frontiers of Innovation initiative, and Zero to Three: National Center for Infants, Toddlers, and Families. It draws context from in-depth discussions with numerous stakeholders and community leaders in the Twin Cities with expertise and influence in the areas of early childhood health, education, policy and development.**



## The Earliest Years: Foundation for all that Follows

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“A child’s quality of life and the contributions that child makes to society as an adult can be traced to his or her first few years of life.”<sup>1</sup>

~ Art Rolnick and Rob Grunewald,  
“Early Childhood Development on a Large Scale”

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In early childhood, physical, cognitive, emotional and social development occurs at a rate that far exceeds any other stage of human life. It has been long understood that early childhood marks a critical period of growth, but science is quickly establishing the scope and importance of this stage not just on learning, social skills, quality of life and opportunity but on long-term health, both physical and mental.

In fact, 80 percent of brain growth occurs by age three.<sup>2</sup> The experiences that inform this growth are highly dependent on a child’s environment, and

the impressionable nature of a young child’s brain means that both positive and negative environmental influences have profound impact. This makes early childhood ripe for enriching and nurturing experiences, but as the *Journal of Zero to Three* points out, it also means that children at this age are disproportionately vulnerable to the damaging effects of an impoverished or “un-nurturing” environment.<sup>3</sup>

Several environmental factors present barriers to healthy early childhood development. Among the most prevalent and most difficult to overcome: poverty, poor nutrition, inadequate housing and limited positive relationships. Each of these factors contributes to “toxic stress” in affected children. Children who experience toxic stress during the first few years of life are disproportionately vulnerable to a lifetime of health problems ranging from compromised immune systems to psychological disorders. These children suffer from reduced quality of life through adulthood and are less likely to be productive members of society. Allowing these children to fall through the cracks in the system as infants and toddlers has a devastating ripple effect with nearly incalculable economic and social ramifications.



Recognizing barriers is important, but perhaps a more essential point of view is to recognize the enormous positive opportunity with this time of life: research shows that early, well-designed interventions have a profound impact on the trajectory of these children's lives. Promoting positive relationships between children and their caregivers provides one of the strongest bulwarks against other, sometimes unavoidable, stressors. Investing in these relationships — along with other strategies that thwart sources of stress and facilitate healthy early childhood development — pays dividends that resonate not only through the entire lifetime of vulnerable children, but through society as a whole. With sound intervention strategies, not only are we building the tools for a productive life; we are creating a virtual armor to protect against the negative influences.

Of the 5.4 million Minnesotans, approximately 275,000 are children three years old and younger. This paper addresses their future: it explores the scope and nature of the early environmental threats that cause a lifetime of challenges; presents early interventions and the promotion of positive relationships as viable antidotes to toxic stress; and makes specific recommendations for strategic steps and policy changes.

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“The trajectory of a child’s neurological development is not disconnected from what they’re experiencing. We know that in terms of both the child’s development and the family’s development that the earlier we promote good health, the earlier we will detect compromised health. In this way, we can more effectively promote a healthy developmental trajectory over time.”

~ Michael Troy, PhD, LP,  
Children’s Hospitals and Clinics of Minnesota

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## Stress: A Powerful Influence

Early childhood may hold the answers to some of the greatest contemporary challenges to public health. Allison Friedman-Krauss and W. Steven Barnett, specialists in education and child care policy, published research in 2013 that shows with escalating clarity that the environment, experiences and relationships encountered during early childhood heavily influence a person’s health and well-being throughout the rest of their lives.<sup>4</sup> The science is compelling and points to tremendous opportunities to influence a child’s health trajectory. Just as positive experiences set the stage for healthy lives, Megan Gunnar and Camelia Hostinar assert that “there is increasing evidence that childhood adversity exposes individuals to an elevated risk of physical and mental health conditions.”<sup>5</sup>

Stress is a critical part of development, and Gunnar and Hostinar differentiate between different kinds of stress. “Acute stressors” offer manageable challenges but are not sustained and persistent and can actually be beneficial.<sup>6</sup> The way we respond to stress is also critical, and inability to respond appropriately is what moves stress from a healthy experience to a

## THE NEUROSCIENCE OF EARLY BRAIN DEVELOPMENT AND TOXIC STRESS

We know that brain development occurs rapidly in the first few years of life. Just how rapidly — and how this growth can be affected by disruptive experiences — is becoming increasingly clear. Harvard researchers report that “in the first few years, 700 new neural connections are formed every second.”<sup>a</sup> While genes (nature) play an important role in the way the brain processes and categorizes this information, experiences (nurture) are also vital. As researchers at Zero to Three: National Center for Infants, Toddlers, and Families explain, “Brain development is ‘activity-dependent’. . . the electrical activity in every circuit — sensory,

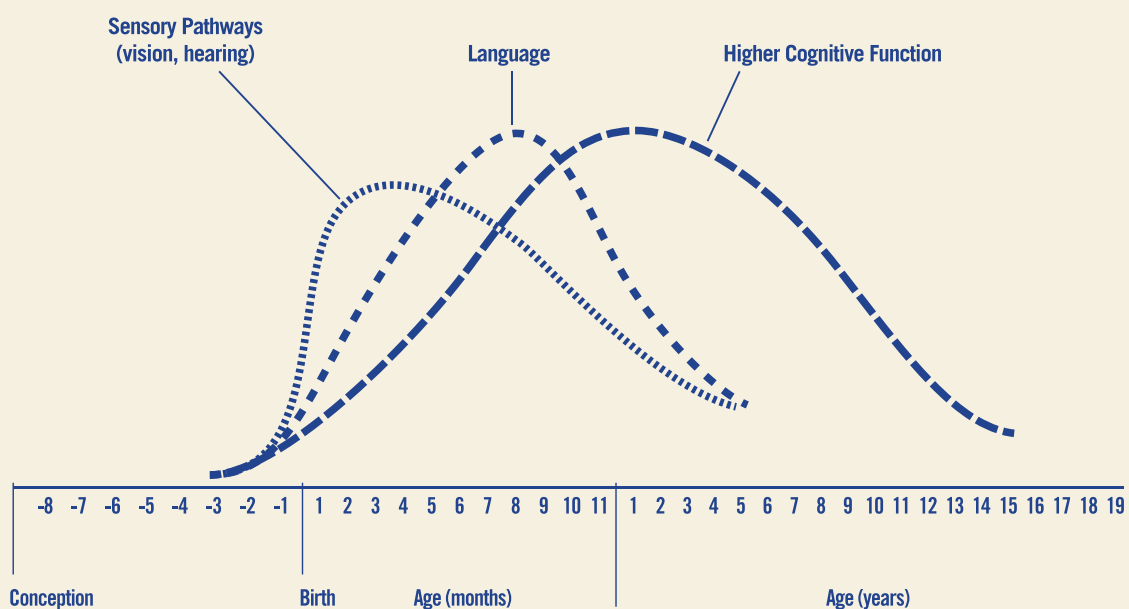
motor, emotional, cognitive — shapes the way that circuit gets put together.” Our brain circuits aren’t static, so “every experience excites neural circuits and leaves others inactive.”<sup>b</sup>

The effects of experience on the developing brain are very real. Circuits triggered regularly will be strengthened. Circuits not triggered regularly may fade away. Researchers at Harvard University’s Center on the Developing Child explain that if elements of toxic stress are persistent triggers, “toxic stress becomes built into the body by processes that shape the architecture of the developing brain.”<sup>c</sup> This

effect is particularly acute in the absence of a positive, loving adult-child relationship that could serve as a “buffer” between toxic stressors and the developing child.

Toxic stress is commonly associated with adult medical problems including heart disease, cancer, depression, obesity, mental health problems, smoking and alcoholism.<sup>d</sup> Yet researchers and child health advocates now know that the effects of toxic stress emerge much earlier than adulthood and in ways far more widespread and debilitating than previously thought.

### Human Brain Development: Synapse Formation Dependent on Early Experiences



threatening one. Chronic, pervasive stressors — especially in someone who has not developed the ability to properly respond to stress — can be damaging to the developing brain, particularly when that stress isn't mitigated by positive relationships with caregivers.<sup>7</sup>

Toxic stress, as it is known, is devastating to a developing brain.<sup>8</sup> Friedman-Krauss and Barnett describe toxic stress as “experiences of severe, uncontrollable, and chronic adversity.”<sup>9</sup> The discussion of stress as it relates to young children and their families is not one of judgment or the popular notion of being “stressed out.” It is a discussion of the science of brain development and the factors that can affect it.

### THE IMPACT OF POVERTY

Stress does not discriminate. Any child, from any socioeconomic background, can be vulnerable. However, there are systemic issues at play that contribute to the likelihood that a child will encounter barriers to healthy development. When looking across racial and ethnic groups, children constitute the poorest segment of Minnesota's population. In fact, nearly 60,000 — or close to 17 percent of — children four years old and younger live below the poverty level in Minnesota. Poverty is an insidious reality that creates a cascade of interrelated stressors. Friedman-Krauss and Barnett assert that “children living in poverty are more likely to experience highly stressful home environments and be exposed to violence, both of which are associated with negative health and developmental outcomes.”<sup>10</sup> Several challenges that frequently co-occur with poverty also produce neglect, whether deliberate or due to the challenges of meeting day-to-day needs.

### FOOD INSECURITY

An adverse home environment is not the only source of toxic stress that may have a higher prevalence in



impoverished home environments. Poverty is also associated with diminished access to good nutrition.<sup>11</sup> Inadequate nutrition is a critical element of early childhood development, and it is also inextricably associated with the cycle of poverty and can reach beyond those living technically at or below the poverty level. Friedman-Krauss and Barnett warn that “without the proper nutrition, children's brain development and health, and consequently their cognitive development, will suffer and they will not reach their full developmental potential, and likely perpetuate their poverty.”<sup>12</sup>

Research has repeatedly established a relationship between food insecurity and myriad mental health problems as well as social, behavioral and academic difficulties among children. In a Hunger-Free Minnesota study exploring the level of increased odds of various consequences of food insecurity, food-insecure children were twice as likely to need to see a psychologist than their food-secure counterparts, four times as likely to require counseling and nearly twice as likely to suffer from ADHD. Food insecurity across all age groups contributed to higher likelihoods of general poor health, migraines, stomachaches, colds, hospitalizations, iron deficiency, and diabetes.<sup>13</sup>

## INADEQUATE HOUSING

Unstable housing also catalyzes a multitude of health problems, both mental and physical in nature. The problems start early — even, in some cases, before birth. According to Sheila Ammons and other specialists in early childhood special education, “Homeless infants often have low birth weights, lack necessary immunizations, and are more likely to be exposed to environmental risks than housed infants. Research shows that 54 percent of these children experience some form of developmental delay.”<sup>14</sup>

Children don’t have to be literally homeless to be profoundly affected by unstable housing situations. Studies have shown that “compared to those in stable homes, children who live in unstable situations have four times the rate of developmental delays, three times the rate of emotional or behavioral problems, and twice the rate of learning disabilities.”<sup>15</sup>

Rebekah Levine Coley et al. have found that “cumulative residential instability” is linked with reduced emotional/behavioral functioning among children.<sup>16</sup> Added to this are the other health-related elements of inadequate housing, including the presence of lead and other environmental toxins that can affect a child’s brain development.

## LACK OF DEVELOPMENTALLY SUPPORTIVE CHILD CARE

Whether at home or in a formal childcare setting, the nature of care affects a host of building blocks along the developmental trajectory. Language, behavioral and social development, and learning are all subject to the interactions, positive and negative, with caregivers. Counteracting negative effects is especially difficult for children in adverse environments. The benefits of high-quality programs — those with nurturing caregivers, a supportive emotional environment, appropriate developmental activities — and the negative effects from poor-quality programs are magnified for children from disadvantaged situations or with special needs, and yet those children are least likely to have access to early development opportunities.

As explained by researchers at Harvard’s Graduate School of Education, “High-quality childcare experiences can begin to mitigate the negative effects of poverty on children’s academic achievement — the poorer the family and/or the greater number of experiences in high-quality care, the bigger the benefit. Developmentally, this effect seems to emerge because high-quality child care provides these children with the early skills required for later school success.”<sup>17</sup>







## A Critical Difference: The Power of Relationships

The effects of toxic stress can be ameliorated. Science has shown that a proven way to combat toxic stress is through attentive, loving relationships. In fact, the relationship between a young child and his or her network of caregivers plays an indelible and far-reaching role in the child's long-term health. According to findings by the Center on the Developing Child, positive relationships — those that facilitate a responsive, stable environment — promote learning capabilities and “well regulated stress response systems.”<sup>18</sup>

While it may not be possible to remove all toxic stressors from every child's environment, it is possible to promote the kind of relationships that give them the best chance for success. Linda Richter, executive director of Child, Youth and Family Development at the Human Sciences Research Council, emphasizes that “children who live in difficult conditions are additionally dependent on the nurture of primary caregivers to shield them from the most threatening features of their environment. Warm and

responsive caregiving extends protection to children in otherwise adverse conditions.”<sup>19</sup>

On the flip side, a lack of positive relationships — and the presence of overtly negative relationships and/or a negative environment — presents profoundly troubling implications. Why? Researchers at the National Scientific Council on the Developing Child have found that “responsive relationships are developmentally expected and biologically essential [and] their absence signals a serious threat to child well-being, particularly in the earliest years, and this absence activates the body's stress response systems.”<sup>20</sup>

The important research that is being done in this arena is as motivating as it is disturbing.

Clinicians are trained to look for signs of physical or sexual abuse in the children that visit medical facilities. In this country, those who work with and on behalf of children legally and functionally prioritize these external markers of maltreatment. Yet there's a less visible but equally concerning issue at hand. Child neglect, be it deliberate or a result of circumstances, is a silent, pervasive threat. As in the case of abuse, the ramifications of child neglect can resonate throughout a child's emotional and physical health for a lifetime.



## STARTING EARLY

In the Bucharest study, the effects were most powerful among children who had been placed in foster care during the first two years of life: “We found that placement into foster care had less effect on cognitive ability if it occurred after the child was 24 months old. Children taken out before 24 months fared significantly better in terms of MDI or IQ than children taken out after 24 months of age. The 24 month cut point is evidence of a sensitive period during which the intervention had its greatest effect.”<sup>22</sup>

The findings of the Bucharest study underscore what is known about the extreme vulnerability of very young children.

Research shows that the very youngest children are the most vulnerable to the insidious effects of failure to meet their developmental needs. A landmark study, the Bucharest Early Intervention Project, co-led by former University of Minnesota researcher Charles Nelson, explored the impact of caregiver attentiveness in early childhood.<sup>21</sup> The children had been institutionalized in Romania, a country that famously endured a population explosion and subsequent child abandonment crisis under Nicolae Ceausescu. These children had all been removed from institutions and placed into foster care, but the story revealed profound negative effects on the institutionalized children, particularly when compared to a community control group.

While the location may seem remote and the circumstances extreme, the findings of the study transcend borders. The effects of the psychosocial deprivation that occurred during the period of institutionalization weren't simply social and emotional in nature. Indeed, the study revealed a disparity in cognitive ability. The institutionalized children scored more than 33 percent lower on a Mental Development Index (MDI) than the control group.

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“There are sensitive periods throughout development when certain capacities are most easily influenced. The most fundamental periods are starting to close at three years old.”

~ Megan Gunnar, Director of the Institute of Child Development, University of Minnesota

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The Bucharest study is far from the only research to suggest that investing in very young children begets significant returns. No one can put a price on quality of life. Yet it is possible to discuss the economics of preventing a lifetime of health care costs for problems associated with toxic stress. We can also discuss the economics of giving vulnerable children the chance to become productive members of society.

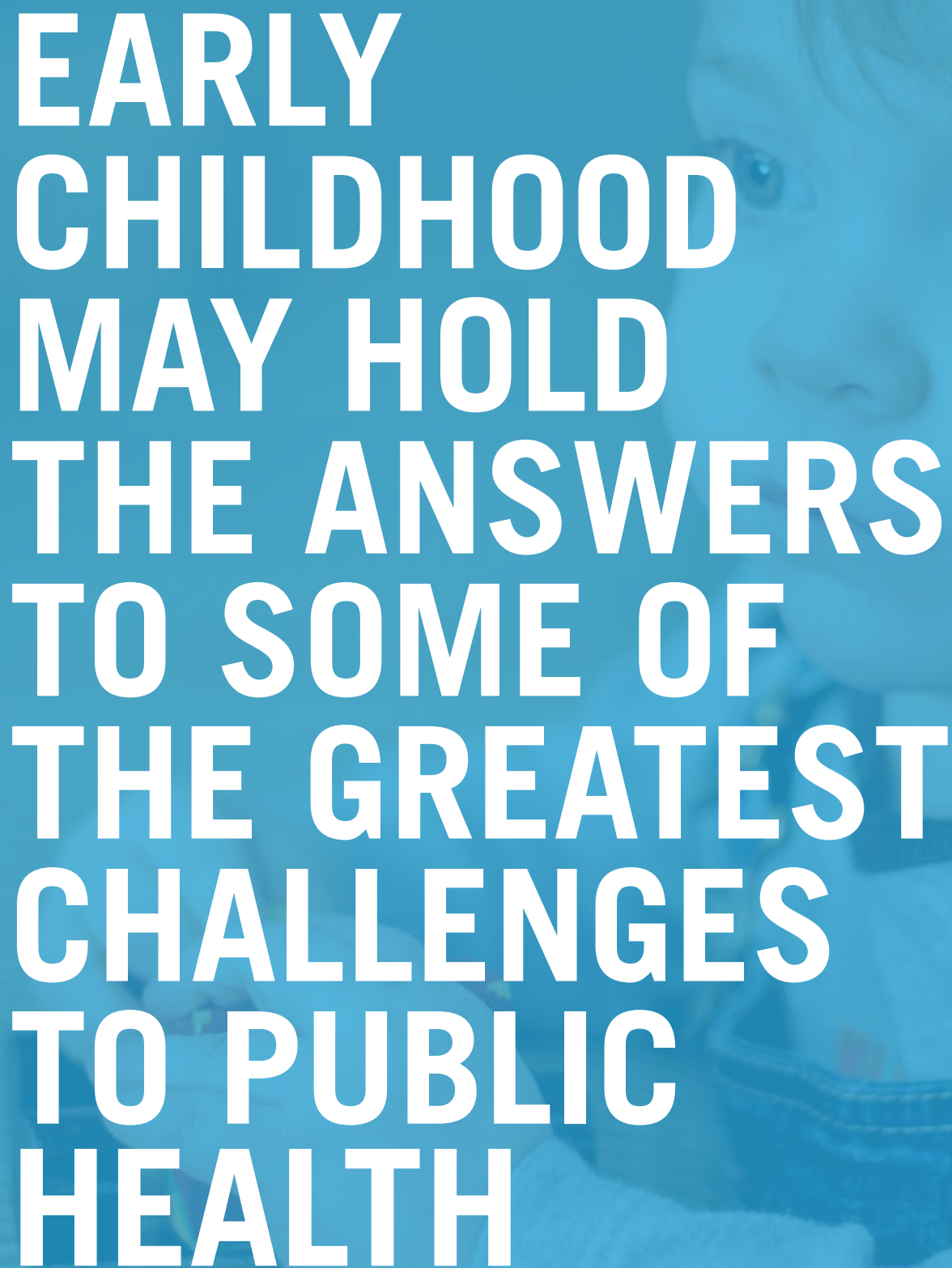
Leading economists and researchers Art Rolnick and Rob Grunewald co-authored a seminal piece illustrating these concepts. In “Early Childhood Development: Economic Development with a High Public Return,” they write that “from birth until about five years old a child undergoes tremendous growth and change. If this period of life includes support for growth in cognition, language, motor skills, adaptive skills and social-emotional functioning, the child is more likely to succeed and later contribute to society. However, without support during these early years, a child is more likely to drop out of school, receive welfare benefits and commit crime.”<sup>23</sup>

Nobel Prize-winning University of Chicago economics professor James Heckman echoes Rolnick and Grunewald’s sentiments and adds quantifiable value: “Investing in quality early childhood development for disadvantaged children from birth through age five will help prevent achievement deficits and produce better education, health, social and

economic outcomes. Such investments will reduce the need for costly remediation and social spending while increasing the value, productivity and earning potential of individuals.”<sup>24</sup>

In evaluating so-called return on investment, it is also instructive to consider the impact of failure to invest. As has been discussed, a wide body of research highlights the array of physical, mental, social and emotional challenges facing individuals whose developmental needs are not met in early childhood. A thorough discussion of the economics of health is outside the scope of this paper. However, it is illustrative to consider costs associated with even a few of the conditions associated with toxic stress. Estimated annual medical costs for obesity in the U.S. were \$147 billion in 2008, with per-person costs of \$1,429 more for people who are obese than for people of normal weight.<sup>25</sup> Coronary heart disease costs \$109 billion per year in the U.S.,<sup>26</sup> and mental health services top \$100 billion per year.<sup>27</sup>





**EARLY  
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## THE ROLE OF FORMAL EARLY CHILDHOOD DEVELOPMENT PROGRAMS

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“There is a need for a high energy early childhood development awareness campaign that drives home the fact that the first few years of a child’s life create momentum for the rest of their life.”

~ Melvin Carter III, Director, Office of Early Learning, Minnesota Department of Education

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Early childhood development programs are a crucial complement to the support that children receive at home. Even parents with adequate time and resources to devote to their children can’t always address the full spectrum of developmental needs necessary to promote positive brain development. For the children whose lives don’t include adequate supportive care, for whatever reason, the role of formal early childhood development programs is even more critical.

Early childhood education is an important part of early childhood development, but the two should not be conflated. Education — in the sense of academic preparation — is critical, but a discussion of education cannot begin if basic needs haven’t been met and the developmental foundation hasn’t been established. In other words, academic preparedness — along with a myriad of other attributes — is an outcome of positive early childhood development. The Frontiers of Innovation initiative from the Harvard-based Center on the Developing Child makes the following recommendations:

- 1) Investments in young children should be viewed as critical building blocks for lifelong health promotion and disease prevention, not just strategies to enhance school readiness and later academic achievement; and
- 2) There is a compelling need for more effective strategies to protect children from the biological consequences of significant adversity, not just to provide enriched learning opportunities.<sup>28</sup>

In any discussion of programs aimed at early childhood, the opportunity gap, also commonly referred to as the “achievement gap,” must be addressed. Greg Duncan and Aaron Sojourner, professors of education and economics, respectively, point out that “it is no secret that children from different socioeconomic strata start school with very different skills.”<sup>29</sup>

Even with the best intentions, lack of funding makes it impossible to reach all vulnerable children. Minnesota’s current funding for Early Head Start and Head Start programs is only sufficient to enroll 19 percent of children under six who live in poverty.<sup>30</sup>

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“We are so focused on education at age three or four that we forget that too many children are starting at a disadvantage off the bat if we are waiting to start until age three.”

~ Richard Chase, Senior Research Manager, Amherst H. Wilder Foundation

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Yet more money isn’t the only answer. In order to reach more children, close the opportunity gap and truly set children on the path to success, the approach to these earliest years needs to be reframed to consider the entirety of a child’s experience. While education — in the traditional sense of gaining academic knowledge and skills — is undoubtedly a gateway to future opportunity, attention must first be paid to the developmental factors that create that success. Heckman believes that supporting the developmental needs of children must start much earlier — at birth, even — with priority given to the development of skills that actually open doors (e.g., character building skills) versus simply focusing on the traditionally prized academic skills.

## Working Together

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“As pediatricians who care for patients with all needs, we engage with early childhood intervention and development systems regularly, yet there isn’t a lot of crossover. I defer to them, I refer to them, I depend on them. If we were truly on the same road as the intervention folks, it would make such a difference.”

~ Gigi Chawla, Medical Director, Children’s Hospitals and Clinics of Minnesota

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Children are falling through the cracks in the system. Pediatricians are a tremendously important component of ensuring the health and well-being of children, but they cannot help the children they don’t see. With less than half of children from birth to two years old meeting well-child visit guidelines established by the AAP, there is a substantial missed opportunity to screen, track, intervene and provide referrals as necessary.<sup>31</sup>

Calls for community-wide, cross-disciplinary initiatives are increasing — and not just in Minnesota. Representatives from NORC at the University of Chicago have posited that “children’s programs should use a multi-sector approach that acknowledges that children are touched by sectors across health, education, and social services.”<sup>32</sup> The NORC team says we are at a “critical crossroads” when it comes to programs aimed at early childhood development, and they’re calling for integration.

Representatives from Harvard’s Frontiers of Innovation initiative echo NORC’s call for enhancing and integrating programs, but they also note that that might not be enough. Citing the number of children who face “the cumulative burdens of low family income, limited parental education and social exclusions,” the FOI team says that efforts to integrate programs must be supplemented by additional strategies aimed at reaching vulnerable children. These strategies, say FOI, must be “linked to knowledge-based theories of change—and programs, communi-

ties, and states that are willing to co-design and test new approaches will play a critical role in creating the future of early childhood policy and practice.”<sup>33</sup>

While Minnesota has a robust community of organizations and programs focused in the areas of housing, nutrition, anti-poverty initiatives, early childhood education, early childhood development and early childhood health care, a disconnection often plagues the present system. These programs, though individually strong, currently function largely in isolation and are arguably under-resourced. Funding is separate, research is separate, initiatives are separate and outcome metrics are evaluated separately. This “silos effect” and congruent dilution of resources preclude progress. Moreover, the health care industry, as a whole, has not been a collaborative partner in addressing these early childhood issues.

This problem is not exclusive to Minnesota. Experts from NORC at the University of Chicago have called for increased streamlining and collaboration at the federal level. The assertion is that the traditional approach of funding child-centered programs “through a variety of mechanisms: directly to state agencies; to state agencies as a pass-through to county and local governments; and directly to community-based providers and organizations [can] lead to coordination, integration and communication challenges.”<sup>34</sup>

## Moving Forward

While the momentum and calls for more systemic, coordinated solutions are gaining increased urgency, the underlying concepts addressed in this paper are familiar to those who have actively worked in this field for years. Pediatricians, social scientists, researchers, child development specialists and organizations working to support disadvantaged families have long understood that a host of factors impact a child. In other words, children don’t operate distinctly as a medical health child, basic life needs child or a mental health child. A child, like all of us, is the sum of all those parts and many more. We also know that no child is the same, and, therefore, there isn’t a template approach that will work well for every child in every circumstance.

The point is that the challenges are real and systemic solutions are hard to find. Yet the opportunity we have with children at this incredibly formative time (birth to three) is too well defined and too scientifically validated to not seek different, more collaborative approaches. So how do we move forward?

In investigating this issue, Children's is seeking to find its right place in advancing a new approach. We want to build on our clinical expertise and role to help drive concrete action that draws on, enhances and validates the incredible early childhood development assets we have in this state. The research, analysis and conversations reflected in this paper have pointed Children's toward certain roles in addition to our constant efforts to enhance our clinical practices, including the following.

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**“In order to address the achievement and readiness gap, we need to get at the root of the issue and look at the more subtle influences of what causes children to be missed. We know that the hardest to serve are not making all of those connections. It really does take engaging the whole family and the community around the development of a young child.”**

**~ Gayle Kelly, Executive Director, Minnesota Head Start**

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### **AWARENESS AND VALIDATION: THE VALUE OF EARLY CHILDHOOD DEVELOPMENT INVESTMENTS**

The science of early brain development — and lifelong health implications — is an urgent argument in support of early childhood development for the very youngest children. Those steeped in the work do not need to be convinced, but to build the level of energy, attention and investment these years warrant, more people need to be informed and convinced. By bringing a traditionally medically health focused voice to this discussion — in support of and partnership with other organizations and experts —

Children's will work to build greater awareness of the undeniable value of this time in a child's life. Further, Children's will help create a powerful platform for policies, programs and investments that promote positive opportunities for all children and families whether they are navigating everyday life circumstances or more extreme factors that interfere with a child's development.

### **ADVOCACY ENGAGEMENT TO SUPPORT CHILDREN AND FAMILIES**

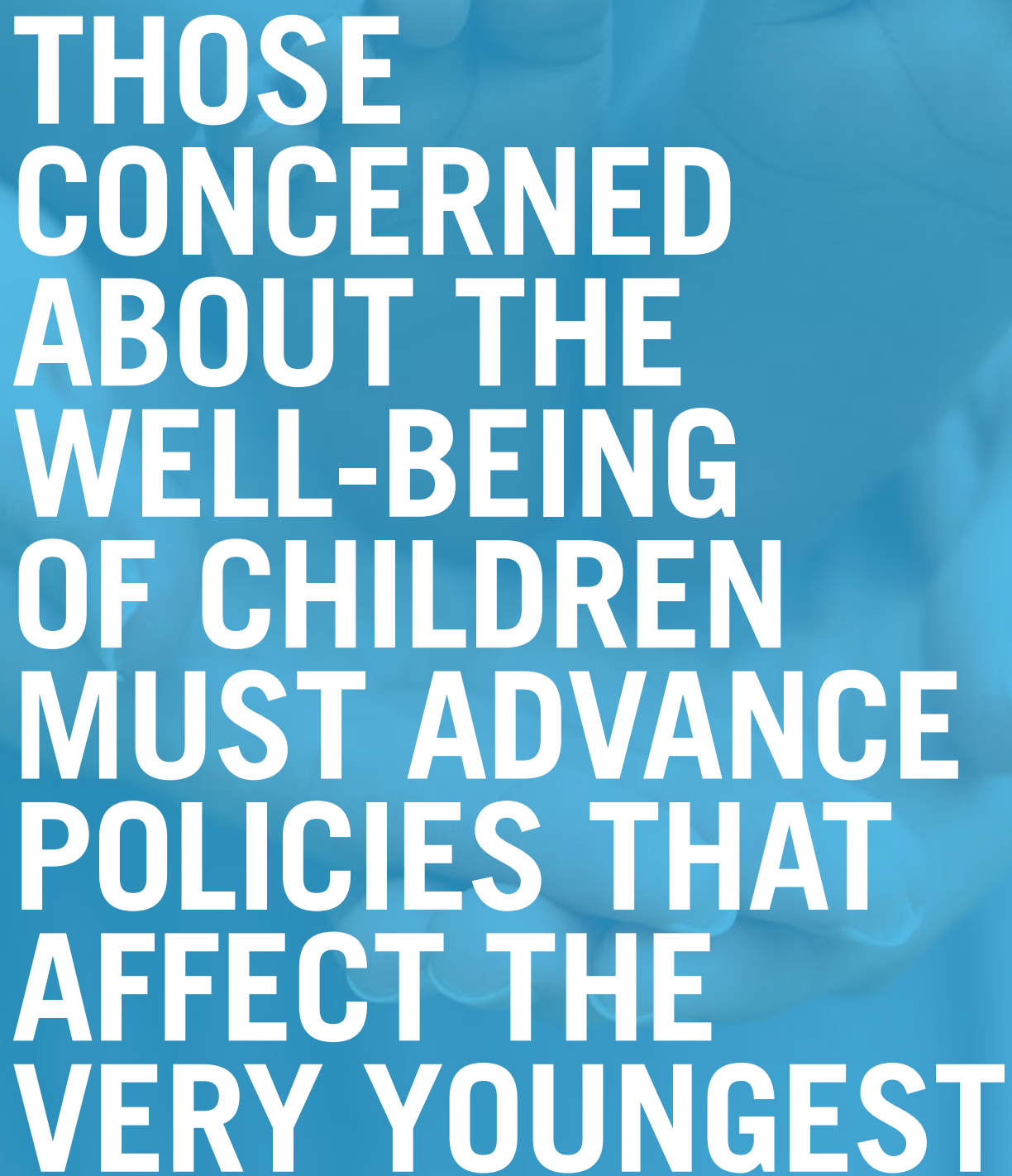
In order to create long-term change, those concerned about the well-being of children must advance policies that affect the very youngest. Working in partnership to systematically assess the factors that interfere with early brain development — and the factors that can mitigate those stresses — will help generate the most salient and persuasive policy proposals.

### **SUPPORTING GOOD WORK**

A fundamental element of Children's approach to this and other community initiatives is to acknowledge and support others' expertise, capacity and knowledge. There are a number of organizations in this region already advancing evidence-based, effective and culturally relevant work. We will look for ways to support and partner with those organizations to advance their good work.

### **CONTRIBUTING TO SYSTEMIC SOLUTIONS**

There is deep commitment to the well-being of young children — especially those living in poverty — among health care providers, caregivers and advocates in our community. Determination and broad-based collaboration will minimize the number of children falling through the cracks. Improved coordination of services and communication between health care providers, childcare programs, agencies, educational institutions and families will alter the course of a child's life. To be truly effective, strategies will be developed with those who are closest to the families so that systems are relevant and navigable.



**THOSE  
CONCERNED  
ABOUT THE  
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## ENDNOTES

Author's Note: The pull-out quotes throughout the text came from recent interviews conducted with experts in the field during the course of this research.

- 1 Grunewald, R., and Rolnick, A. "Early Childhood Development on a Large Scale." The Region; Federal Reserve Bank of Minneapolis, June 2005. Accessed at: [http://www.minneapolisfed.org/publications\\_papers/pub\\_display.cfm?id=3279](http://www.minneapolisfed.org/publications_papers/pub_display.cfm?id=3279)
- 2 "Baby's Brain Begins Now: Conception to Age 3." The Urban Child Institute. Accessed at: <http://www.urbanchildinstitute.org/why-0-3/baby-and-brain>
- 3 "Frequently Asked Questions on Brain Development." *Journal of Zero to Three* 28(5), May 2008. Accessed at: [http://main.zerotothree.org/site/DocServer/ZTT28-5\\_may\\_08.pdf?docID=7321](http://main.zerotothree.org/site/DocServer/ZTT28-5_may_08.pdf?docID=7321). Page 44.
- 4 Friedman-Krauss, A., and Barnett, W. S. "Preschool Policy Brief: Early Childhood Education: Pathways to Better Health." National Institute for Early Education Research, April 2013. Page 3.
- 5 Gunnar, M., and Hostinar, C. "The Developmental Psychobiology of Stress and Emotion in Childhood." *Handbook of Psychology*, Vol. 6. Ed. I. Weiner, R. Lerner, M. Easterbrooks, and J. Mistry. Hoboken, N.J.: Wiley, 2013. Page 121.
- 6 Ibid., 122.
- 7 Ibid.
- 8 Center on the Developing Child at Harvard University and the National Scientific Council on the Developing Child. "The Science of Neglect: The Persistent Absence of Responsive Care Disrupts the Developing Brain." 2012. Accessed at: [http://developingchild.harvard.edu/resources/multimedia/videos/inbrief\\_series/inbrief\\_neglect/](http://developingchild.harvard.edu/resources/multimedia/videos/inbrief_series/inbrief_neglect/). Page 1.
- 9 Friedman-Krauss, A., and Barnett, W. S. Preschool Policy Brief, 5.
- 10 Ibid., 5.
- 11 Ibid.
- 12 Ibid., 18.
- 13 Mykerezzi, E., et al. "Cost/Benefit Hunger Impact Study." Hunger-Free Minnesota, September 2010. Accessed at: <http://hungerfreemn.org/wp-content/uploads/2014/01/HFMN-Cost-Benefit-Research-Study-FULL-9.27.10.pdf>. Page 3.
- 14 "Unstable Living Situations and Early Childhood Mental Health." University of Pittsburgh Office of Child Development, 2010. Accessed at: <http://www.ocd.pitt.edu/Files/PDF/ECMH-unstableliving.pdf>. Page 1.  
Original Source: Ammons, S., et al. Helping Young Children (Birth to Five) Who Are Homeless, 2008.
- 15 Ibid., 1.  
Original source: Cuidando los Ninos, Caring for Children of Homeless Families, 2009. Retrieved from: <http://cInkids.org/learn/importance-of-early-intervention/>.
- 16 Levine Coley, R., et al. "Policy Research Brief: Poor Quality Housing Is Tied to Children's Emotional and Behavioral Problems." MacArthur Foundation: How Housing Matters, September 2013. Accessed at: [http://www.macfound.org/media/files/HHM\\_Policy\\_Research\\_Brief\\_-\\_Sept\\_2013.pdf](http://www.macfound.org/media/files/HHM_Policy_Research_Brief_-_Sept_2013.pdf). Page 2.
- 17 Barry, D. "High-Quality Early Childcare=Later Academic Success?" Harvard Graduate School of Education. Accessed at: <http://www.gse.harvard.edu/news-impact/2009/11/high-quality-early-child-care-later-academic-success/>  
Original source: <http://www.gse.harvard.edu/news-impact/2009/09/quality-of-early-child-care-plays-role-in-later-reading-math-achievement/>
- 18 National Scientific Council on the Developing Child and National Forum on Early Childhood Policy and Programs. "The Foundations of Lifelong Health are Built in Early Childhood: Summary of Essential Findings." Center on the Developing Child at Harvard University. Page 2.
- 19 Richter, L. "The importance of caregiver-child interactions for the survival and healthy development of young children." Department of Child and Adolescent Health and Development; World Health Organization. Accessed at: <http://whqlibdoc.who.int/publications/2004/924159134X.pdf>. Page 4.
- 20 National Scientific Council on the Developing Child. "The Science of Neglect: The Persistent Absence of Responsive Care Disrupts the Developing Brain." Center on the Developing Child at Harvard University. Page 1.
- 21 Fox, N. A., Zeanah, C. H., and Nelson, C.A. "A Matter of Timing: Enhancing Positive Change for the Developing Brain." *Journal of Zero to Three* 35(3), January 2014. Page 6.

- 22 Ibid., 7.
- 
- 23 Rolnick, A., and Grunewald, R. "Early Childhood Development: Economic Development with a High Public Return." The Region; Federal Reserve Bank of Minneapolis, December 2003. Accessed at: <http://datacenter.spps.org/sites/2259653e-ffb3-45ba-8fd6-04a024ecf7a4/uploads/ABC-Part2.pdf>. Page 7.
- 
- 24 Heckman, J. "Lifelines for Poor Children." Excerpted from *New York Times*, September 15, 2013. Accessed at: [http://opinionator.blogs.nytimes.com/2013/09/14/lifelines-for-poor-children/?\\_php=true&\\_type=blogs&\\_r=0](http://opinionator.blogs.nytimes.com/2013/09/14/lifelines-for-poor-children/?_php=true&_type=blogs&_r=0)
- 
- 25 "Overweight and Obesity." Centers for Disease Control and Prevention. Accessed at: <http://www.cdc.gov/obesity/data/adult.html>
- 
- 26 "Heart Disease Facts." Centers for Disease Control and Prevention. Accessed at: <http://www.cdc.gov/heartdisease/facts.htm>
- 
- 27 "Mental Health Expenditures as a Percent of All Health Care Expenditures (2003)." National Institute of Mental Health. Accessed at: <http://www.nimh.nih.gov/Statistics/4EXP2003.shtml>
- 
- 28 Shonkoff, J.P. "Testimony Prepared for the Robert Wood Johnson Foundation Commission to Build a Healthier America — June 2013." RWJF Commission to Build a Healthier America. Accessed at: <http://www.rwjf.org/content/dam/farm/reports/reports/2013/rwjf406412>
- 
- 29 Duncan, G., and Sojourner, A. "Can Intensive Early Childhood Intervention Programs Eliminate Income-Based Cognitive and Achievement Gaps?" *Journal of Human Resources* 48(4), 2013. Page 947.
- 
- 30 "Statewide School Readiness Report Card: Public program access." Wilder Research. Accessed at: <http://www.wilder.org/Wilder-Research/Publications/Studies/School%20Readiness%20Report%20Card/Fact%20Sheet%202,%20Statewide%20School%20Readiness%20Report%20Card%20Public%20Program%20Access.pdf>
- 
- 31 "Issue Brief: Factors Influencing Preventive Service Utilization By Minnesota Children." Minnesota Department of Health, March 2004. Accessed at: <http://www.health.state.mn.us/divs/hpsc/hep/publications/utilization/2004-02.pdf>. Page 2.
- 
- 32 "Improving Children's Health and Well-being by Integrating Children's Programs." NORC at the University of Chicago, 2011. Page 2.
- 
- 33 Shonkoff, J.P. "Testimony Prepared for the Robert Wood Johnson Foundation Commission to Build a Healthier America — June 2013." RWJF Commission to Build a Healthier America. Accessed at: <http://www.rwjf.org/content/dam/farm/reports/reports/2013/rwjf406412>
- 
- 34 "Improving Children's Health and Well-being by Integrating Children's Programs." NORC at the University of Chicago, 2011. Page 5.
- 

## ENDNOTES FOR "THE NEUROSCIENCE OF EARLY BRAIN DEVELOPMENT AND TOXIC STRESS"

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- a Center on the Developing Child at Harvard University. "InBrief: The Science of Early Childhood Development." Accessed at: [http://developingchild.harvard.edu/resources/briefs/inbrief\\_series/inbrief\\_the\\_science\\_of\\_ecd/](http://developingchild.harvard.edu/resources/briefs/inbrief_series/inbrief_the_science_of_ecd/). Page 1.
- 
- b "FAQ's on the Brain." Zero to Three: National Center for Infants, Toddlers, and Families. Accessed at: <http://www.zerotothree.org/child-development/brain-development/faqs-on-the-brain.html#role>
- 
- c Center on the Developing Child at Harvard University. "InBrief: The Science of Early Childhood Development." Accessed at: [http://developingchild.harvard.edu/resources/briefs/inbrief\\_series/inbrief\\_the\\_science\\_of\\_ecd/](http://developingchild.harvard.edu/resources/briefs/inbrief_series/inbrief_the_science_of_ecd/). Page 2.
- 
- d Friedman-Krauss, A., and Barnett, W. S. Preschool Policy Brief, 5.
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