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## 3 Principles to Improve Outcomes for Children and Families

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## ABOUT THE AUTHORS

The Center on the Developing Child at Harvard University's mission is to drive science-based innovation that achieves breakthrough outcomes for children facing adversity. We believe that the science of development provides a powerful source of new ideas focused on the early years of life. Founded in 2006, the Center catalyzes local, national, and international innovation in policy and practice for children and families. We test and implement these ideas in collaboration with a broad network of research, practice, policy, community, and philanthropic leaders. Together, we seek transformational improvements in lifelong educational achievement, economic security, and physical and mental health.

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The science in this report draws principally from the work of the **National Scientific Council on the Developing Child**. We are very grateful for the ongoing contributions of this distinguished, multi-disciplinary, multi-university panel. <http://www.developingchild.net>

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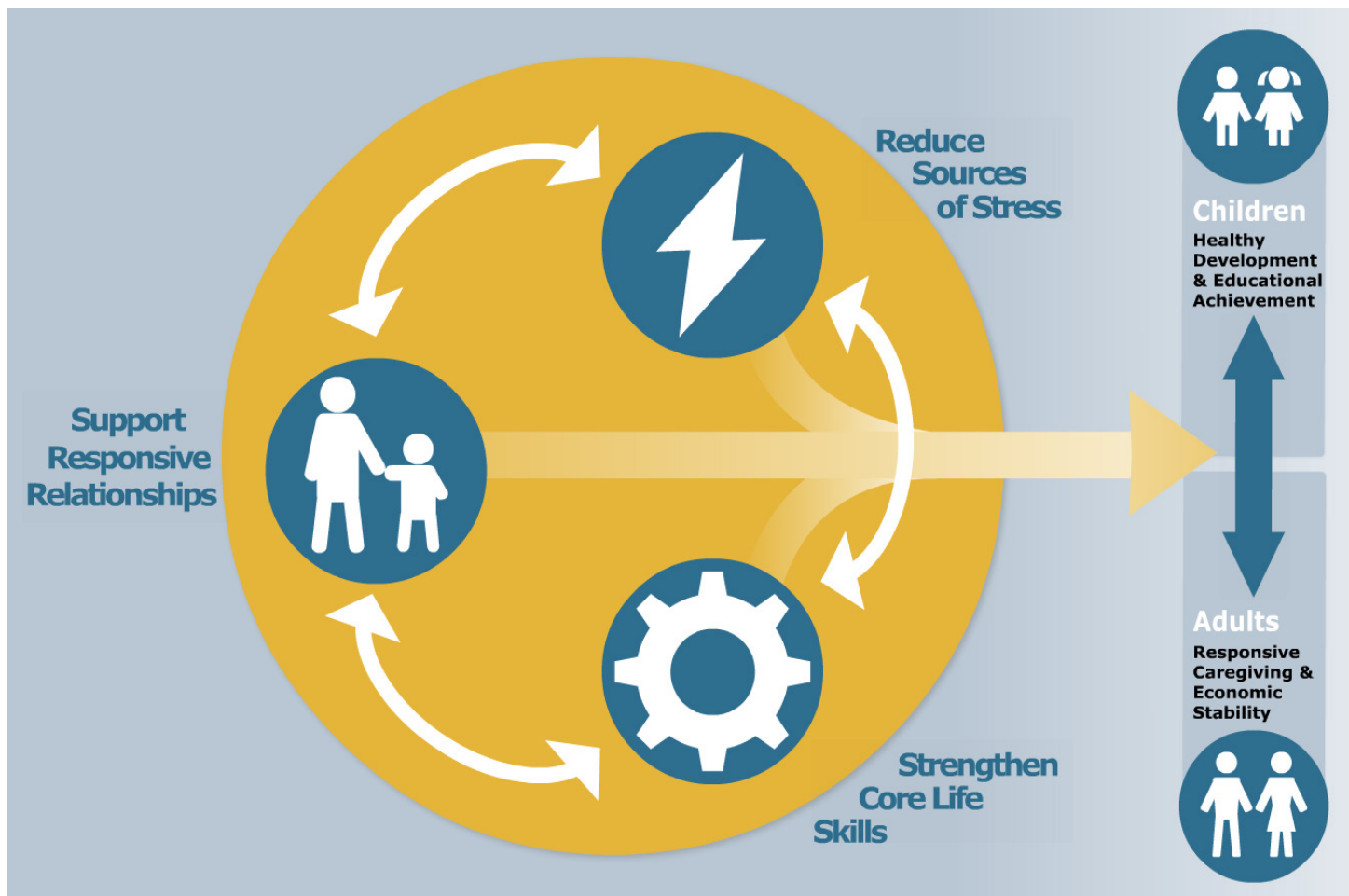
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# Core Principles of Development Can Help Us Redesign Policy and Practice

RECENT ADVANCES IN THE SCIENCE OF BRAIN DEVELOPMENT OFFER US AN UNPRECEDENTED opportunity to solve some of society’s most challenging problems, from widening disparities in school achievement and economic productivity to costly health problems across the lifespan. Understanding *how* the experiences children have starting at birth, even prenatally, affect lifelong outcomes—combined with new knowledge about the core capabilities adults need to thrive as parents and in the workplace—provides a strong foundation upon which policymakers and civic leaders can design a shared and more effective agenda.

The science of child development and the core capabilities of adults point to a set of “design principles” that policymakers and practitioners in many different sectors can use to improve outcomes for children and families. That is, to be maximally effective, policies and services should:

1. **Support responsive relationships for children and adults.**
2. **Strengthen core life skills.**
3. **Reduce sources of stress in the lives of children and families.**



These three principles can guide decision-makers as they choose among policy alternatives, design new approaches, and shift existing practice in ways that will best support building healthy brains and bodies. They point to a set of key questions: What are current policies, systems, or practices doing to address each principle? What could be done to address them better? What barriers prevent addressing them more effectively?

## The three principles point to a set of key questions:

**What are policies, systems, or practices doing to address each principle? What could be done to address them better? What barriers prevent addressing them more effectively?**

Moreover, these design principles, grounded in science, can lead policymakers to think at all levels about the forces that could lead to better outcomes for children. At the individual level, policies can focus on skill-building for both kids and adults; at the human services level, they might focus on the critical place of relationships in promoting healthy development, supportive parenting, and economic productivity; and at the systemic or societal level, policies can emphasize reducing sources of stress that create lifelong challenges for children and make it extraordinarily difficult for adults to thrive as parents and breadwinners.

### The Science Behind the Principles

Scientists have discovered that the experiences children have early in life—and the environments in which they have them—not only shape their brain architecture, but also affect whether, how, and when the developmental instructions carried in their genes are expressed. This is how the environment of relationships young children experience with adult caregivers, as well as early nutrition and the physical, chemical, and built environments, all get “under the skin” and influence lifelong learning, behavior, and

both physical and mental health—for better or for worse. Starting at birth and continuing throughout life, our ability to thrive is affected by our ongoing relationships and experiences and the degree to which they are healthy, supportive, and responsive or not.

The biology of stress activation also explains *why* significant hardship or threat (e.g., from abuse, neglect, or extreme poverty) can lead to physiological and behavioral disruptions that can have lasting impact. Not all stress is bad—for example, children need to experience manageable amounts of stress in the presence of supportive adults to develop a healthy stress response system. But frequent or extreme experiences that cause excessive stress can be toxic to the architecture of children’s developing brains and can overload adults’ capacity to engage productively in work, families, and communities. Fortunately, most of us have powerful stress-protection shields in the form of supportive caregivers, families, and friends. Stable and responsive relationships in the earliest years of life help protect children from the potential harm that excessive stress can cause, and in adulthood they provide the buffering and hope that are necessary for resilience.

Experiencing significant adversity early in life can set up our body’s systems to be more susceptible to stress throughout life, with long-term negative consequences for physical and emotional health, educational achievement, economic success, social relationships, and overall well-being. For adults who have experienced a pile-up of adversity since childhood, the additional weight of *current* adversity, such as prolonged poverty, may overload their ability to provide the stable, responsive relationships children need and consistently meet the demands of the modern workplace. Therefore, these scientific findings are relevant to policy choices in a wide variety of areas—from traditional “children’s” areas such as pediatrics, early care and education, and child nutrition to “adult” domains such as income support, employment training, foster parent training, health care, and housing.



## PRINCIPLE 1: Support Responsive Relationships

FOR CHILDREN, [RESPONSIVE RELATIONSHIPS](#) WITH ADULTS HAVE A DOUBLE BENEFIT, BOTH promoting healthy brain development and providing the buffering protection needed to prevent very challenging experiences from producing a toxic stress response. For adults, healthy relationships also boost well-being, providing practical assistance and emotional support and strengthening hope and confidence, all of which are needed to survive and weather stressful situations. By supporting responsive, [serve-and-return](#) interactions between adults and children, and strong relationships between caseworkers and their adult clients, sound public policy has the power to promote children's healthy development *and* reinforce adults' core life skills. Further, when adults are supported and can model responsive relationships with each other and with children, the benefits come full circle, ultimately helping children become healthy, responsive parents themselves.

### Why?

Responsive relationships early in life are the most important factor in building sturdy [brain architecture](#). Think of building a house; it's constructed in a certain order and the foundation establishes a base upon which everything else is built. The same is true with developing brains. Brain architecture is comprised of *trillions* of connections among neurons across different areas of the brain. These connections enable lightning-fast communication among neurons that specialize in different kinds of brain functions.

A major active ingredient in this developmental process is the [serve-and-return interaction](#) between children and their parents and with other caregivers in the family or community. When an infant or young child babbles, gestures, or cries, and an adult responds appropriately with eye contact, words, or a hug, neural connections are built and strengthened in the child's brain. Given the foundational importance of the first few years of life, the need for responsive relationships in a variety of settings, starting in infancy, cannot be overstated. When policies support caregivers' ability to be sensitive and responsive to a young child's sig-

nals and needs, those caregivers are better able to provide an environment rich in serve-and-return experiences and help lay down a sturdy foundation for all that comes later.

**When adults model responsive relationships, the benefits come full circle, ultimately helping children become healthy, responsive parents themselves.**

Relationships also help build [resilience](#) across childhood and into adulthood. The single most common factor for children and teens who develop the capacity to overcome serious hardship is having at least one stable and committed relationship with a supportive parent, caregiver, or other adult. These relationships provide the personalized responsiveness and protection that buffer children from developmental disruption and model the capabilities—such as the ability to plan, monitor, adjust, and regulate behavior—that enable individuals to respond adaptively to adversity and thrive. This combination of supportive relationships, adaptive skill-building, and positive

experiences *interacts* with genetic predispositions to form the foundation of resilience.

While responsive relationships in childhood help build a lifelong foundation for resilience, they continue to be important throughout our lives. They help adults deal with stress, support self-regulation, and promote a positive outlook for the future. By contrast, the social isolation experienced by many parents living in poverty or dealing with mental health or substance abuse problems can trigger a range of negative side effects. Public policies and human service programs that are specifically designed to support the skills and environments that foster responsive relationships between children and those who care for them support healthy development and improve child outcomes. Likewise, service providers who listen responsively, treat clients with respect, and support them in planning for the future are more likely to be effective in promoting positive change.

Here are some examples of ways to apply the **support responsive relationships** design principle to **policy**:

- Provide sufficient flexibility in benefits to avoid the disruption of critical relationships with caregivers that happens when children cycle in and out of programs due to loss of a child care subsidy, housing instability, or involvement in the child welfare system.
- Establish policies that strengthen family relationships whenever possible; for example, promote frequent contact between children in out-of-home care and their parents and

siblings, or minimize changes of placement for children in out-of-home care.

- Ensure that workers in service programs have adequate compensation, professional development, and supervision in order to reduce the high level of turnover in these positions that disrupts relationships between staff and clients.
- Offer services through trusted organizations and individuals in the community that have already built strong relationships with community members.

Next, here are examples of opportunities to apply this principle to **practice**:

- Coach adult caregivers on serve-and-return interaction with children in a wide range of settings, including pediatrics, early care and education programs, home visiting, and even employment training programs.
- Develop hiring practices aimed at identifying and selecting staff who are motivated to build strong relationships with their clients; for example, use an interview process in which candidates can be observed relating to others.
- Provide workers in service programs with enough time to develop relationships with the people they are expected to help, as reflected by caseload/class sizes, as well as allow for interactions of sufficient duration, frequency, and consistency, and reduce documentation requirements that can cause staff to spend too much time with forms and too little with their clients.



## PRINCIPLE 2: Strengthen Core Life Skills

WE ALL NEED A SET OF [ESSENTIAL SKILLS](#) TO MANAGE LIFE, WORK, AND RELATIONSHIPS successfully. These core capabilities support our ability to focus, plan for and achieve goals, adapt to changing situations, and resist impulsive behaviors. No one is born with these skills; they are developed over time through coaching and practice. Policies that help children and adults strengthen their core life skills are essential not only for their success as students and workers, but also as parents, when they can pass along the same capabilities to the next generation.

## Why?

Scientists call these capabilities [executive function and self-regulation skills](#). Just as an air traffic control system at a busy airport safely manages the arrivals and departures of many aircraft on multiple runways, the brain needs this skill set to filter distractions, prioritize tasks, remember rules and goals, and control impulses. These skills are crucial for learning and development. They also set us up to make healthy choices for ourselves and our families.

Children facing significant adversity can develop these skills—and adults can strengthen them—when policies, programs, and skilled caregivers or caseworkers create environments that provide “scaffolding” for efforts to use these skills. Scaffolding is simply developmentally appropriate support that gets people started and steps in as needed, allowing them to practice the skills before they must perform them alone. Adults can facilitate the development of a child’s executive function skills by establishing routines, modeling appropriate social behavior, and creating and maintaining supportive, reliable relationships. Science shows that the brain continues to adapt to experiences throughout life and that adults, too, can [strengthen these skills through coaching and practice](#).

In the first three years of life, we start learning to use these core capabilities in basic ways—like focusing attention, responding to limit-setting, and following simple rules. Between ages 3 and 5, we make huge gains in using these skills as we practice them more and more, learn to adjust flexibly to different rules for different contexts, and resist impulsive behaviors.

By later childhood and adolescence, with the right experiences and support, our brains are ready to build the skills required for more complex situations—resisting peer pressure, setting long-term goals and plans, and dealing productively with setbacks. As adults, we continue to use these skills in managing our households, meeting deadlines at work, and strategically planning for the future. Although it’s much easier to begin developing these skills early in life, it’s never too late to improve them. Even after our mid-20s, adults can still learn new skills and strengthen others, but it

requires far greater effort if the foundation is weak.

Included below are examples of ways to apply the **strengthen core life skills** design principle to **policy**:

- In contracting for service programs, prioritize those that explicitly focus on self-regulation and executive function skills and incorporate opportunities for program participants to practice these skills.
- Reduce regulatory barriers and increase incentives for two-generation programs to actively build the core skills of children and the adults they depend on.
- Develop education and early learning policies that recognize the importance of executive function and self-regulation as an important strand in the “braided rope” of skills children need to succeed academically.

## Core life skills are crucial for learning, development, and making healthy choices for ourselves and our families.

And, here are examples of opportunities to apply this principle to **practice**:

- Adopt coaching models that help individuals identify, plan for, and meet their goals.
- Focus on small, incremental steps with frequent feedback; for example, break down the goal “find housing” into steps like finding out what’s available, what neighborhoods are best, contacting landlords, visiting, asking questions, etc., with opportunities for responsive feedback along the way.
- Create regular opportunities to learn and practice new skills in age-appropriate, meaningful contexts, such as play-based approaches in early childhood; planning long-term school projects in adolescence; and role-playing a difficult conversation with a boss in adulthood.
- Scaffold skill development with tools such as goal-setting templates, text reminders, timelines, and planners.



## PRINCIPLE 3: Reduce Sources of Stress

NOT ALL STRESS IS BAD, BUT THE UNREMITTING, [SEVERE STRESS](#) THAT IS A DEFINING FEATURE of life for millions of children and families experiencing deep poverty, community violence, substance abuse, and/or mental illness can cause long-lasting problems for children and the adults who care for them. Reducing the pile-up of potential sources of stress will protect children directly (i.e., their stress response is triggered less frequently and powerfully) and indirectly (i.e., the adults they depend upon are better able to protect and support them, thereby preventing lasting harm). When parents can meet their families' essential needs, teachers and caseworkers have effective training and manageable class sizes/caseloads, and policies and programs are structured and delivered in ways that reduce stress rather than amplify it, families are better able to take advantage of community services that support healthy child development.

### Why?

[Excessive activation of stress response systems](#) affects the brain and other organ systems in many ways. When we feel threatened, our body prepares us to respond by increasing our heart rate, blood pressure, and stress hormones, such as cortisol. When stress response systems are activated within an environment of supportive relationships, these physiological effects are moderated and brought back down to baseline. However, if the stress response is extreme and long-lasting—and supportive relationships are unavailable—it can overload multiple biological systems.

Chaotic, threatening, and unpredictable situations and environments that activate the “fight or flight” response repeatedly or excessively can make it difficult to engage [executive function skills](#)—the underlying skills we all need to plan, focus, adjust, and resist impulsive behaviors. And while it's good to practice these skills, constant and intensive demand on them to deal with stressful situations can deplete them—just as exercise is good for physical fitness, but a marathon can leave us physically exhausted.

Frequently experiencing circumstances that seem beyond our control can also lead to a

low sense of self-efficacy (the belief that we can improve our own lives), which is needed to engage in planned, goal-oriented behaviors. Simply put, having fewer experiences that trigger a sustained, powerful stress response allows a child's brain to build and strengthen the neural connections for learning and advanced cognitive skills and allows an adult's brain to access the skills they already have.

Chronic activation of stress response systems in early childhood, especially without the ongoing presence of a responsive adult, can lead to [toxic stress](#), which disrupts the healthy development of brain architecture. Experiencing toxic stress during these early years can affect learning, behavior, and health throughout the lifespan. It's like revving a car engine for days or weeks on end—constant activation of the stress response has a wear-and-tear effect on the brain and other biological systems. Constant stress also depletes precious energy the brain needs for healthy development in childhood and adulthood to deal with consequential decisions—of which there are many for parents dealing with economic instability or other problems.

In addition, people who have experienced serious early adversity are more likely to per-



ceive and focus attention on potential threats throughout life. While brain development and adaptation continue across the life course, it's always harder and more costly to remediate than to prevent problems. A multi-generational approach to reducing external sources of stress on families has double benefits: It means that adults will be better able to provide responsive relationships and stable environments for children, and it allows children to develop healthy stress response systems and sturdy brain architecture, to focus better on learning, and to receive a lifetime of benefits from these early building blocks of resilience.

Listed below are examples of opportunities to apply the **reduce sources of stress** design principle to **policy**:

- Reduce barriers to families accessing basic supports, such as nutritious food, safe shelter, medical care, and mental health services, with special attention to the needs of children during periods of severe hardship or homelessness.
- Establish simplified, streamlined rules for eligibility determination and re-certification for benefits and services, while minimizing punitive regulations that add stress to already stressful situations.
- Provide consistent, adequate funding to prevent unexpected loss of services, which

is a source of stress to both service providers and families, in order to offer stability that enables adults to focus on responsive caregiving.

### Constant stress depletes precious energy the brain needs for healthy development in childhood and adulthood.

Finally, here are examples of ways to apply this principle to **practice**:

- Help parents strengthen the skills they need to create a stable and supportive home environment with consistent and predictable routines.
- Routinely ask about and respond to the major stressors affecting families as part of the assessment process conducted in many types of service programs;
- Provide services in well-regulated, welcoming environments.
- Provide workers in service programs with the supports they need, such as reasonable caseload/class sizes, responsive supervision, and skill development, to manage their own stress so they can help their clients effectively.



## How the Policy and Practice Design Principles Interact

THESE THREE PRINCIPLES DO NOT OPERATE IN ISOLATION. IN FACT, THEY ARE HIGHLY interconnected and reinforce each other in multiple ways. First, progress on any of the three makes progress on the others more likely. For example, reducing sources of stress makes it easier to access and use executive function and self-regulation skills; it also frees up time and energy to participate in responsive interactions. Likewise, helping parents and caregivers improve executive functioning supports their ability to engage in serve-and-return interactions with the children in their care and to create a more stable and predictable caregiving environment.

Second, each individual's functioning has important effects on every other member of the family. For example, when an adult caregiver creates a well-regulated environment, children are likely to experience less stress, which supports their healthy development; their improved behavior in turn reduces stress for caregivers, providing a greater opportunity for the adults to continue to build their own self-regulation and executive function skills.

**Using these design principles to promote positive change on all three dimensions is our best chance to help adults provide safe and responsive caregiving, and to help children get (and stay) on track for healthy development.**

Unfortunately, the converse is also true: significant challenges in any one of these areas can lead to problems in the others. Using these design principles to promote positive change on all three dimensions is our best chance to help adults provide safe and responsive caregiving, and to help children get (and stay) on track for healthy development.

### The Design Principles in Action

Policymakers, system leaders, and practitioners can apply these three design principles in several ways. Below are three suggestions.

1. *As a subject of inquiry about **current policies and operations**.* To what extent do current policies and operations promote (or hinder) responsive relationships and the development of core capabilities? To what extent do they diminish (or increase) sources of stress? What is preventing us from doing better? To find the answers to these questions, leaders might conduct a series of observations and conversations at the front lines, where workers are engaged personally with both child and adult clients. This is likely to produce important information about how things work now and suggestions for how they might work differently in the future.
2. *As a set of tests applied to **proposed changes in policy or system operations**.* When changes to laws and/or regulations are proposed, they are commonly evaluated for their potential economic and budgetary impact. The three design principles in this paper provide an additional framework for analyzing such proposals. Compared to current operations, how might the changes under consideration affect prospects for responsive relationships, for developing core capabilities in both adults and children, and for reducing sources of stress? Given those likely impacts, how strong is the case for (or against) the changes as currently envisioned? How might the proposals be modified in order to produce more positive effects and/or fewer negative consequences?
3. *As an organizing framework for **developing new policies or program strategies**.* Sometimes assessments of and changes to current policies are not enough. Making use of what has been learned from observations and conversations with workers and clients, leaders might ask questions like: Suppose we want our system to do the best possible job of promoting responsive relationships, both between caregivers and children and between our workers and the clients they are trying to help. How would we redesign the system to do that? What are the manageable, incremental changes we might adopt soon to get started, and what are the larger and more complex changes that we might aim for over time?

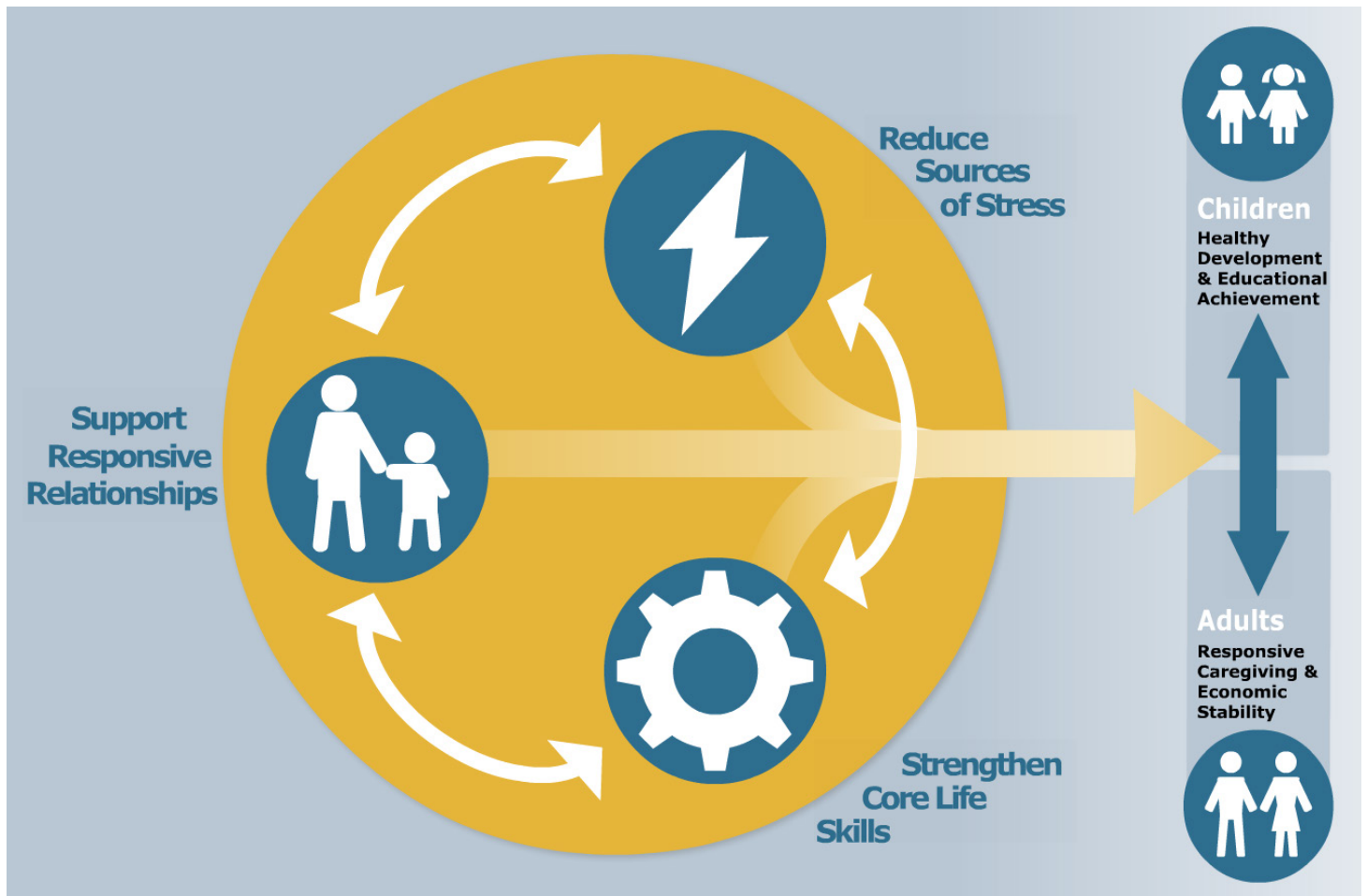
#### »»» ACTION STEP

How are you using the three design principles to reshape policy or practice? Share your experiences at: <https://developingchild.harvard.edu/3principles-survey>

# Applying Science to Policy and Practice

UNDERSTANDING THE MAJOR INFLUENCES ON CHILD DEVELOPMENT AND HOW ADULTS DEVELOP and use executive function and self-regulation skills—and especially the effects of excessive stress on both—is critical for improving life outcomes for individuals and all of society. Only when we have a basic understanding of what builds resilience and how problems in learning, behavior, and lifelong health come to be, can we effectively address the causal mechanisms that underlie them.

Drawing on a common understanding of how positive development can be either promoted or derailed, practitioners and policymakers can think in new ways about how we can do a better job supporting children and families. This science-based framework offers a promising guide for generating new ideas about how to meet the objectives of each policy or practice system more effectively—and, in the end, achieve significant improvements in outcomes for the children and families who are the foundation of our communities and our shared future.



# Additional Resources

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Except as noted, all resources are from the Center on the Developing Child and available at <http://developingchild.harvard.edu>.

## The science behind the principles

[\*Early Experiences Can Alter Gene Expression and Affect Long-Term Development. Working Paper 10.\*](#) (2010)

[\*Supportive Relationships and Active Skill-Building Strengthen the Foundations of Resilience. Working Paper 13.\*](#) (2015)

[\*From Best Practices to Breakthrough Impacts: A Science-Based Approach to Building a More Promising Future for Young Children and Families.\*](#) (2016)

## Responsive relationships

“Key Concepts: Brain Architecture.”

<https://developingchild.harvard.edu/science/key-concepts/brain-architecture/>

“Key Concepts: Serve and Return.”

<https://developingchild.harvard.edu/science/key-concepts/serve-and-return/>

[\*Young Children Develop in an Environment of Relationships. Working Paper 1.\*](#) (2004)

[\*The Timing and Quality of Early Experiences Combine to Shape Brain Architecture. Working Paper 5.\*](#) (2007)

[\*The Science of Neglect: The Persistent Absence of Responsive Care Disrupts the Developing Brain. Working Paper 12.\*](#) (2012)

## Core life skills

“Deep Dives: The Science of Adult Capabilities.”

<https://developingchild.harvard.edu/science/deep-dives/adult-capabilities/>

“Key Concepts: Executive Function & Self-Regulation.”

<https://developingchild.harvard.edu/science/key-concepts/executive-function/>

[\*Building the Brain’s “Air Traffic Control” System: How Early Experiences Shape the Development of Executive Function. Working Paper 11.\*](#) (2011)

[\*Building Core Capabilities for Life: The Science Behind the Skills Adults Need to Succeed in Parenting and in the Workplace.\*](#) (2016)

## Stress

“Key Concepts: Toxic Stress.”

<https://developingchild.harvard.edu/science/key-concepts/toxic-stress/>

[\*Excessive Stress Disrupts the Architecture of the Developing Brain. Working Paper 3.\*](#) (2005, updated 2014)

Shonkoff, J.P., Boyce, W.T., McEwen, B.S. (2009). [Neuroscience, molecular biology, and the childhood roots of health disparities: Building a new framework for health promotion and disease prevention.](#) *JAMA*, 301(21), 2252-2259.

Shonkoff, J.P. (2016). [Capitalizing on advances in science to reduce the health consequences of early childhood adversity.](#) *JAMA Pediatrics*, 170(10), 1003-1007.

## WORKING PAPER SERIES

- Working Paper 1** *Young Children Develop in an Environment of Relationships* (2004)
- Working Paper 2** *Children's Emotional Development Is Built into the Architecture of Their Brains* (2004)
- Working Paper 3** *Excessive Stress Disrupts the Architecture of the Developing Brain* (2005, updated 2014)
- Working Paper 4** *Early Exposure to Toxic Substances Damages Brain Architecture* (2006)
- Working Paper 5** *The Timing and Quality of Early Experiences Combine to Shape Brain Architecture* (2007)
- Working Paper 6** *Establishing a Level Foundation for Life: Mental Health Begins in Early Childhood* (2008, updated 2012)
- Working Paper 7** *Workforce Development, Welfare Reform, and Child Well-Being* (2008)
- Working Paper 8** *Maternal Depression Can Undermine the Development of Young Children* (2009)
- Working Paper 9** *Persistent Fear and Anxiety Can Affect Young Children's Learning and Development* (2010)
- Working Paper 10** *Early Experiences Can Alter Gene Expression and Affect Long-Term Development* (2010)
- Working Paper 11** *Building the Brain's "Air Traffic Control" System: How Early Experiences Shape the Development of Executive Function* (2011)
- Working Paper 12** *The Science of Neglect: The Persistent Absence of Responsive Care Disrupts the Developing Brain* (2012)
- Working Paper 13** *Supportive Relationships and Active Skill-Building Strengthen the Foundations of Resilience* (2015)

## REPORTS

- Early Childhood Program Evaluations: A Decision-Maker's Guide* (2007)
- The Science of Early Childhood Development: Closing the Gap Between What We Know and What We Do* (2007)
- A Science-Based Framework for Early Childhood Policy: Using Evidence to Improve Outcomes in Learning, Behavior, and Health for Vulnerable Children* (2007)
- The Foundations of Lifelong Health Are Built in Early Childhood* (2010)
- Building Core Capabilities for Life: The Science Behind the Skills Adults Need to Succeed in Parenting and in the Workplace* (2016)
- From Best Practices to Breakthrough Impacts: A Science-Based Approach to Building a More Promising Future for Young Children and Families* (2016)
- Applying the Science of Child Development in Child Welfare Systems* (2016)