

# Building Core Capabilities for Life

The Science Behind the Skills Adults Need to Succeed in Parenting  
and in the Workplace



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**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, and philanthropic leaders. Together, we seek transformational improvements in lifelong educational achievement, economic security, and physical and mental health.

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# The Issue

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CONSIDER THE SKILLS ADULTS NEED TO GET AND KEEP A JOB, CARE FOR CHILDREN, MANAGE finances, and contribute productively to a community. We must be able to focus, plan ahead, avoid distractions, and shift our behavior according to the differing demands and rules of work and family. We need to remember important information and follow multiple-step processes or instructions. We need to be able to stop ourselves from acting impulsively and persist in tedious tasks in order to achieve long-term goals. When these skills have not developed as they should, or are compromised by the everyday stresses of poverty or other sources of ongoing adversity, our communities pay a substantial price in population health, education, and economic vitality. If we can systematically provide opportunities for adults to build the core skills that are needed to be productive participants in the workforce and provide stable, responsive environments for the children in their care, our economy will be stronger, and the next generation of citizens, workers, and parents will thrive.

But where do these capabilities come from and how do they develop? How can we ensure that everyone has the opportunity to develop them? What compromises our ability to develop or use these skills? Many of those working in human services—workforce development programs, poverty alleviation, child welfare, early care and education, even juvenile and adult justice systems—are seeing a common pattern. Adults who are experiencing and/or have experienced a pile-up of adversity are generally less able to deploy the very skills they need to succeed amidst challenging circumstances.<sup>1</sup>

Understanding how these capabilities develop and work in the brain points to two primary reasons for this pattern:

- **Severe, frequent stress experienced early in life** redirects the focus of brain development *toward* rapid response to threat and *away* from planning and impulse control.
- **Severe, frequent stress experienced as an adult** overloads our ability to use the capabilities we have and need most to overcome long-term life challenges.

Chaotic, stressful, and threatening situations can derail any of us. Lack of sleep, poor nutrition, domestic abuse, financial instability, and uncertainty about housing are just a few of the factors that can pile up and overwhelm anyone's physiological capacity to plan and

**Adults who have experienced a pile-up of adversity are generally less able to deploy the very skills they need to succeed amidst challenging circumstances.**

respond to situations appropriately. Experiences early in life, too, can undermine the initial development of these core capabilities. And, when adults did not have the chance to practice—as children—the skills needed to thoughtfully manage and respond to challenging events and circumstances, they must exert even more physiological and emotional effort to counteract the stress of current problems.

This additional challenge increases the likelihood of being overwhelmed by problems and unable to see a path to a solution. And, when human service programs that are intended to help adults have arbitrary and confusing requirements that are hard to follow, the level of chronic stress is ratcheted up another level, further overburdening their clients and their ability to manage life's tasks.

Think of two musicians: One has been playing since childhood, received music lessons, and had years of practice. The other did not have those opportunities and just started playing later in life. They are equally committed, but it seems like music

comes naturally to the first, while the second struggles because of not having had the opportunity to build the foundational skills as a child. The challenge is even greater when it is compounded by serious stress—it’s hard for either musician to concentrate on music if there’s a threat of violence, serious concerns about food or money, or conflicting advice from multiple sources just as the performance is starting. The less experienced musician can begin to close the gap with extra coaching and practice, but it will always be more difficult, and stress can make it worse.

Adults who are overloaded by the stress associated with poverty, violence, addiction, mental illness, or maltreatment may also have been impeded from fully building their self-regulation skills as children, giving them an additional layer of difficulty when filling some key adult roles.

**We know from science that it is never too late to help adults build up their core capabilities, and that we can have a life-long intergenerational impact if adults support the development of these skills in children.**

- **Parenting**—Attention to an infant’s cues is important in shaping maternal sensitivity and supporting the “serve and return” interactions that build strong neural connections in the developing brain.<sup>2</sup> When parents or caregivers are overburdened with stresses, they are less attuned to their infant’s facial expressions and may have more negative emotional responses to their infant’s cries.<sup>3</sup> Depression worsens this dynamic.<sup>4,5,6</sup> Over time, parents may report increased irritability<sup>7,8</sup> and their infants can become more dysregulated, creating a cycle of mutual dysregulation and stress. Without adequate opportunities to develop self-regulation and behavioral control skills, such parents face a greater challenge in trying to

avoid inappropriate, rash, or even aggressive responses to the kinds of stressful situations that are common with young children.

- **Workplace**—Especially in low-wage, high-stress jobs (such as many demanding service positions), adults whose self-regulation systems have been affected by the stresses of adversity are more likely to perceive the world in a negative or threatening way. Interactions with others may seem hostile, and strategies for reducing negative emotions less available.<sup>9,10</sup> As with parenting, this suggests a cycle in which individuals have heightened attention to negative emotional cues and, as a result, increased feelings of anxiety and distress. In these situations, workers may interpret their interactions with supervisors, peers, and customers as being negative even when they are not intended to be so. This in turn affects how the self-regulation system responds. Helpful feedback can open people up to noticing and responding to emerging opportunities, but a lack of feedback—or negative feedback—can undermine one’s sense of competency and increase negative feelings about the workplace.<sup>11-14</sup> This can result in a “self-fulfilling prophecy” of poorer performance, higher turnover, and a greater likelihood of negative or aggressive responses on the job.

These challenges are real and have powerful effects on individuals and communities, but they are solvable. We know from developmental science that it is never too late to help adults build up their core capabilities, and that we can have a life-long impact if adults support the development of these skills in children. A rapidly growing knowledge base from the biological and behavioral sciences, combined with practical, on-the-ground knowledge from working with adults and families, points toward more effective solutions both in the systems that provide pathways out of poverty and in helping individuals develop more effective skills for coping with adversity.

# What Are the Core Capabilities Adults Need Most?

AN INCREASING BODY OF KNOWLEDGE FROM neuroscience and psychology points to a set of underlying core capabilities that adults use to manage life, work, and parenting effectively. These include, but are not limited to, planning, focus, self-control, awareness, and flexibility. To scientists, these capabilities fall under the umbrella of “self-regulation,” which is built upon a foundation of “executive function.”

**Self-regulation** is the set of capabilities that help us to draw upon the right skills at the right time, manage our responses to the world, and resist inappropriate responses.<sup>15</sup> In the brain, self-regulation includes both *intentional* and *automatic* processes.<sup>16</sup>

- **Intentional:** Conscious efforts to set and stick to a plan, and to inhibit counter-productive or distracting responses to situations. This is sometimes thought of as

“top-down” processing or proactive, goal-directed behavior.<sup>17</sup>

- **Automatic:** Fast, non-conscious management of responses to the environment. This is sometimes thought of as “bottom-up” processing or impulsive behavior.<sup>18</sup>

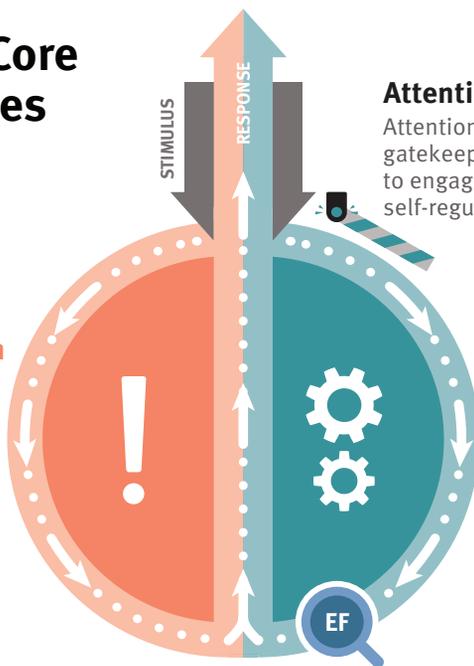
Both intentional and automatic systems are important parts of self-regulation, and both are needed—in the right balance—to ensure appropriately responsive and productive actions.

**Executive function** is the foundation for successful self-regulation. In essence, it makes *intentional* self-regulation possible. There are three main categories of executive function skills: *inhibitory control* (the ability to resist impulsive behavior), *working memory* (the capacity to hold and manipulate information in our heads over short periods of time), and *mental flexibility* (the ability to adjust to

## How Our Core Capabilities Work

### Automatic Self-Regulation

Rapid, impulse-directed  
“Fight or flight” response  
Important for urgent situations



### Attention

Attention is the critical gatekeeper that’s needed to engage intentional self-regulation.

### Intentional Self-Regulation

Conscious, planful, proactive  
Inhibits automatic responses  
Important for achieving goals

Essential capabilities such as planning, focus, and self-control are all orchestrated by the balance of two kinds of self-regulation mechanisms: **automatic** and **intentional**. The proper balance ensures appropriately responsive and productive actions.

REQUIRES

### Executive Function

- 1 Inhibitory Control
- 2 Working Memory
- 3 Mental Flexibility

changed demands, priorities, or perspectives). Much like an air traffic control system manages the comings and goings on busy runways, executive function skills help us to pursue objectives by executing the steps needed to reach them, resist distractions along the way, and find a Plan B when Plan A doesn't work out—all essential components of being able to plan for and achieve goals.<sup>19,20</sup>

**The core capabilities that adults use to manage life, work, and parenting effectively include, but are not limited to, planning, focus, self-control, awareness, and flexibility.**

Common tasks that require planning—also called goal-directed behavior—include identifying the steps needed to conduct a job search, creating a household budget, making arrangements for child care in advance, and prioritizing which work project needs to be completed first.<sup>21</sup> Planning requires a learned skill set: being able to set goals, identify obstacles and possible solutions, lay out the series of steps needed to achieve goals, set appropriate deadlines and reminders, monitor progress, reflect, strategize, and adjust if necessary.

Of course, succeeding as a worker or a parent requires more than planning—it also requires being able to identify what needs attention and avoid distractions, to act and respond appropriately in different contexts, and to remember what the best actions are, among many others. Executive function skills underlie

all of these abilities, and self-regulation uses those skills to navigate the world around us.

**Attention** is the critical gatekeeper that's needed to effectively self-regulate.<sup>17,22,23</sup> We need to be able to *direct* our attention toward specific things within and around us and *monitor* what is happening with them. Attention includes that moment-by-moment awareness of thoughts, feelings, behavior, performance, and progress toward a goal, as well as your surroundings and context, such as others' behavior and how it may influence you. Without that ability to be aware and assess situations accurately, our responses may be inappropriate or missing. Examples of strong monitoring skills include being able to ask and assess:

- How well am I doing at this task?<sup>24</sup>
- Is my behavior appropriate in this setting?
- Are my actions consistent with achieving my goal?<sup>25</sup>
- What is he/she thinking?<sup>26</sup>

**Physiological effort** is required to mobilize core capabilities. Just as intense physical activity can tire our muscles, intensive demands on core capabilities can wear them down.<sup>27-29</sup> But also like physical fitness, recent evidence suggests that self-regulation, executive function, and attention skills (as well as stamina for using them) can be built over time through practice. For example, it takes energy to maintain focus amidst multiple distractions—think of how you feel after a long drive in traffic or bad weather—but dealing with such distractions without overloading our attention is something that we can get better at through practice and experience.

## How Do These Core Capabilities Work Together?

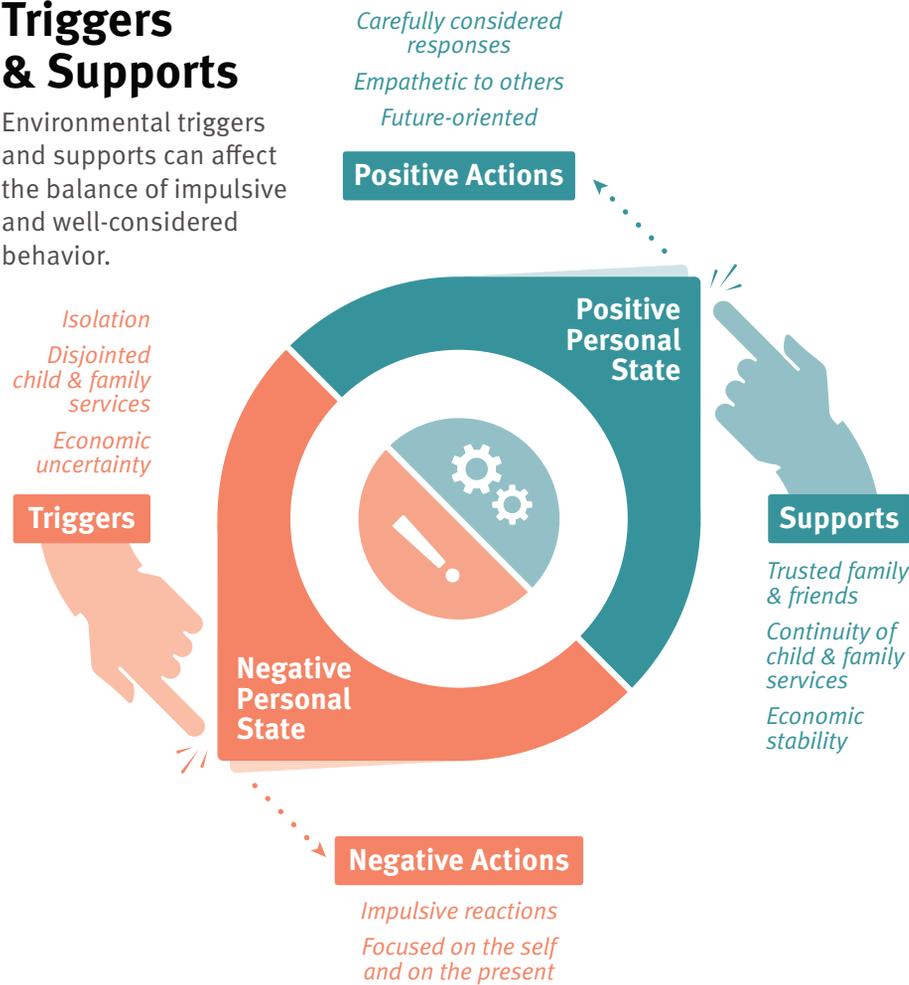
IMAGINE ANY SITUATION THAT REQUIRES A response—a knock on the door, a cry from your baby, a call from the school nurse, an order from a supervisor, or a request from a customer. First the brain must recognize the situation as something that requires a response. This recognition launches a rapid-fire cycle of triggers and neurotransmitters in the brain that operate in an intricate, mutually dependent way.<sup>22,23</sup> The automatic system responds first, orienting to where the stimulus is coming from and

initiating a response. The attention system alerts the intentional self-regulation system, which must act fast—directing the attention system to where it should focus and how to prioritize multiple stimuli (crying baby, honking horn, ringing doorbell). It also sends a signal quickly to the automatic system as to whether the initial response is the right one, or more careful thought is required.

All of this takes effort—intentional regulation most of all—and if any part of the cycle doesn't

## Triggers & Supports

Environmental triggers and supports can affect the balance of impulsive and well-considered behavior.



do its job, the response to that situation is likely to be ineffective or inappropriate in some way. Emotionally powerful stimuli (whether frightening, anger-inducing, or highly enticing), capture everyone's attention more easily than neutral events,<sup>30-33</sup> and the balance of attention, automatic responses, and intentional self-regulation can be upset by any number of things, whether fatigue, temporary overload, or the long-term effects of stress.

Experiencing serious adversity early in life can affect the development of these processes, leading to an overbalance of automatic responses that place heavy demands on the intentional capacities needed to constantly regulate them. In other words, early adversity predisposes people to perceive situations as potential threats and act quickly via powerful automatic responses. In order to resist these impulsive responses, people must develop very strong intentional self-regulation skills, which will be called upon

(and depleted) constantly if dealing with frequent perceptions of threat.

The brain's attention system helps determine which other systems are engaged. Attention and focus are necessary to utilize intentional self-control, but what we pay attention to and how we connect a new experience to past experiences are often automatic actions that affect how we will respond.<sup>34-36</sup> The ways in which we have experienced the world fundamentally frame how we perceive our environments and the choices we make in those environments.

This framing process happens so quickly that we may not be conscious of the ways in which our attention has become biased. For example, consider the difference in one's response to an unexpected knock on the door in the middle of the night versus the middle of the day. In the middle of the night, attention is typically directed automatically to concerns for safety, vigilance to threat, formulation of plans for

taking immediate action, and a physiological state that would prepare one for fight or flight. In contrast, in the middle of the day, attention would be directed to potential scenarios (forgotten appointment, solicitation, etc.), annoyance or surprise, and plans for addressing and perhaps minimizing interruption.

## We know that supportive, responsive relationships in stable, safe environments support the healthy development of the whole brain in the earliest years.

This cycle demonstrates a continuum between reactive or impulsive behavior at one end and proactive or goal-directed behavior at the other. Both reactive and proactive behaviors are important adaptations to the environment in which people develop, and quick responses are helpful in the face of immediate threats. But when longer-term goals are more important than immediate concerns, that requires proactive behaviors. Having the right balance is an important part of being able to use our core capabilities productively. The extremes on

this continuum can be compared on multiple dimensions:

- Now vs. later: react immediately or think about consequences for the future.
- One factor vs. many: consider only the most obvious factor or consider how the decision will influence other outcomes.
- Self vs. others: focus only on your own needs or think about how your actions will affect other people (e.g., children, co-workers, etc.).<sup>21</sup>

Financial instability, chronic stress,<sup>37</sup> lack of sleep,<sup>38</sup> and/or social isolation can overload our intentional and proactive abilities and push us toward reactive behavior, with a focus on the now, the self, and the single-factor explanation. Supports that alleviate life challenges can reduce stress levels and build intentional self-regulation and executive function skills, which push us toward proactive behaviors and a refreshed ability to consider the future and the well-being of others. The presence or lack of these environmental triggers of impulsive behavior and supports for more well-considered responses, then, has a profound effect on the balance of our behaviors as well as on our sense of control, hope, and self-efficacy.

## How Do These Core Capabilities Develop?

**The foundations of executive function and self-regulation are built in early childhood, but the full range of skills, and the widespread neural network that connects them, continues to develop into the adolescent and early adult years.**<sup>39</sup> While adults can continue to learn these skills through coaching and practice, it's easier and more effective to build on a strong foundation. The rudimentary signs of these capacities (e.g., focusing, attention) emerge during the first year of life. By age 3, most children are already using executive function skills in simple ways (e.g., remembering and following simple rules). Ages 3-5 show a remarkable burst of improvement in the proficiency of these skills (e.g., increased impulse control and cognitive flexibility), with another significant increase occurring approximately between ages 15 and 23.

The orchestration of these skills requires communication between the prefrontal cortex

and other brain regions. With time and the right experiences, brain regions devoted to different mental functions connect. These connections allow the regions to communicate with each other; later in childhood and adolescence, the connections become more efficient.<sup>40</sup> Two things are happening in the brain during this time:

- increased efficiency of function *within* specific regions of the brain;<sup>41</sup> and
- faster flow of information *among* regions, which allows for better integration.<sup>42</sup>

**The brain is dynamic and changes according to what we do and experience, and the impact of experiences is greatest when specific regions of the brain are still developing.**<sup>43</sup> Influences on prefrontal cortex development begin in utero or even before conception as a result of maternal health and well-being.

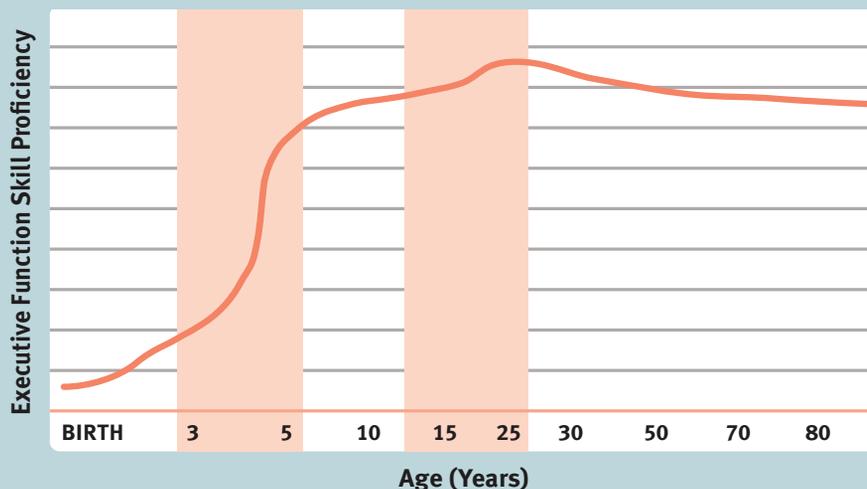
Negative influences on the prefrontal cortex include poor nutrition, exposure to excessive alcohol, drugs, toxins, neglect, abuse, and chronic stress. We know less about specific positive influences, but higher socioeconomic status, exercise, cognitive training, adequate sleep, and mindfulness all have protective influences.<sup>44</sup>

We also know that supportive, responsive relationships in stable, safe environments support the healthy development of the whole brain in the earliest years. The brain is most sensitive to outside factors (for better or for worse) while it's still developing, but the window of greatest opportunity and vulnerability likely depends on the brain network or region of interest.<sup>45</sup> The older someone is and the closer a region of their brain is to maturity, the harder it will be to influence the development of that area. For example, basic emotional circuitry matures early, so neglect or abuse in the first few years of life can have long-lasting effects on social and emotional functioning even into adult life.<sup>46</sup> But the network of brain regions responsible for executive function and self-

regulation continues to mature through the early 20s, so there is potentially a long window of time to influence those behaviors.<sup>45</sup> It's also believed that strengthening these skills can help to compensate for deficits in other areas.<sup>21</sup>

**The prefrontal cortex is still sensitive to experience in adulthood, and the adult brain is still able to build the complex networks required for executive function and self-regulation.** Although there is age-related decline, when it comes to performance, these skills and the brain regions that support them are malleable, and can be strengthened depending on how much they are practiced. In young adults preparing for professional exams, for example, neuroscientists observed both structural changes relating to the speed of communication between regions, and functional changes relating to increased communication between the prefrontal cortex and other regions that are important for reasoning.<sup>47,48</sup> In short, research consistently shows that the prefrontal cortex can be changed well into adulthood.<sup>49</sup>

## Executive Function Skills Build Throughout Childhood and Adolescence



A range of tests measuring different forms of executive function skills indicates that they begin to develop shortly after birth, with ages 3 to 5 providing a window of opportunity for dramatic growth. This growth continues throughout childhood, with another spurt of development in late adolescence and early adulthood. These skills remain relatively intact over the adult years, followed by gradual decline in later life.

Source: Weintraub, S., Dikmen, S.S., Heaton, R.K., Tulsky, D.S., Zelazo, P.D., Bauer P.J., ... & Gershon, R.C. (2013). NIH toolbox for the assessment of neurological and behavioral function: Cognition assessment using the NIH Toolbox. *Neurology*, 80 (11, suppl. 3), S54-64.

# What Derails Our Ability to Use These Core Capabilities?

**Serious early adversity can affect later self-regulatory abilities.** Early in life, exposure to highly stressful environments is associated with deficits in the development of working memory, attention, and inhibitory control skills.<sup>50-52</sup> Early trauma overdevelops the “fear circuitry” in the brain, making one more likely to perceive and focus attention on potential threats throughout life.<sup>53</sup> If threats are seen where none exist, or are perceived to be greater than they really are, they can easily hijack the attention system, trigger the automatic response system inappropriately, and reduce the ability to regulate attention and emotion.

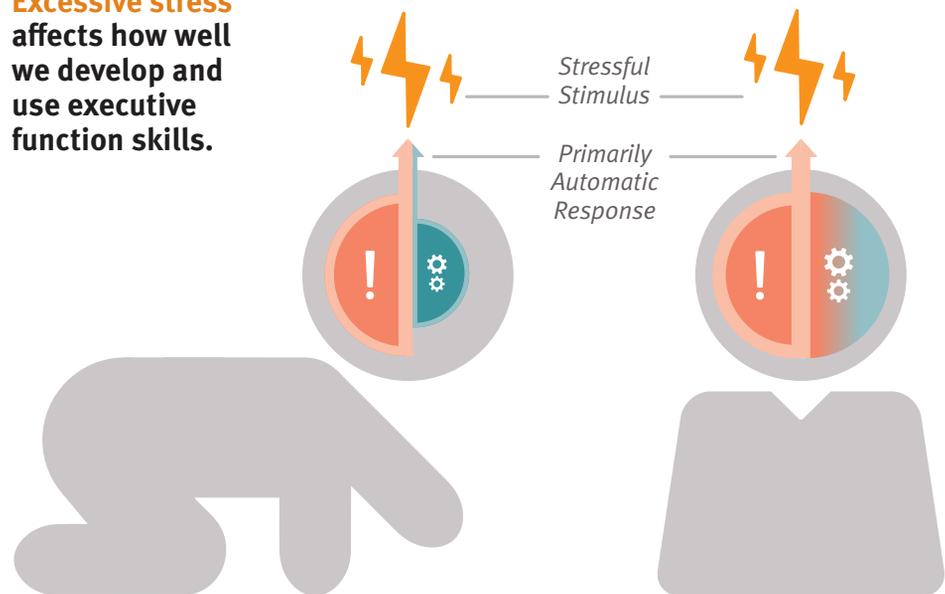
Early trauma also increases the magnitude of the body’s stress response over the lifespan,<sup>53</sup> which leads to higher physiological levels of stress, higher risk of stress-related health difficulties and mood disorders, greater difficulty modulating and accurately appraising emotion, and compromised executive function abilities.<sup>54-57</sup> Exposure to severe and chronic

adversity early in life can trigger a toxic stress response that affects the chemistry of brain circuits involved in the development of executive function and self-regulation capacities. This impairs the specific neuronal architecture that is engaged when we try to keep information in working memory, inhibit a habitual action, or address problems in a flexible manner. Toxic stress can also destabilize mental health, an essential foundation for self-regulation.<sup>53,58-63</sup>

**Chaotic, threatening, or unpredictable environments can lead to poor self-regulatory behaviors and impulse control.**

Chronic experiences of threat can have a wear-and-tear effect on the body’s stress response systems.<sup>53,64-66</sup> All adults have had the experience of encountering a threat and experiencing fear or anxiety, which in excess can dampen our ability to think productively and planfully. Under such circumstances, the brain goes into “fight-or-flight” mode, and we

**Excessive stress affects how well we develop and use executive function skills.**



## Early Childhood

Severe, frequent stress redirects children’s brain development away from planning and impulse control toward building the capacity for rapid threat response.

## Adulthood

Excessive stress overloads adults’ ability to use executive function and intentional self-regulation skills, leaving them to rely primarily on automatic responses.

have to calm ourselves down before we can mobilize our intentional self-regulation skills. Acute stress can cause less-efficient prefrontal cortex activity, leading to a temporary reduction in executive function abilities. Thus, chronic fear and anxiety associated with living in threatening or chaotic environments can make it very difficult to engage executive functions, even in situations that may, in fact, be safe.

Frequently experiencing circumstances that seem beyond our control can also lead to a low sense of self-efficacy—the belief that one is able to be an agent in improving one’s life—which is an essential component of executing planful, goal-oriented behaviors. This pattern can be seen in work environments with low levels of autonomy and high emotional demands and stress, which can negatively affect parenting behaviors.

In one study, mothers’ transitions to low-wage work with low levels of control were associated with increases in their use of harsh, negative parenting at home and less sensitive, more detached caregiving in child care and early education settings.<sup>67,68</sup> Another study linked the instability of low-wage work and its related economic conditions to increased parenting stress and reduced ability for adults to provide effective care for their children. Harsh and ineffective caregiving have been shown to negatively affect children’s emotional regulation and to increase children’s behavior problems.<sup>69-71</sup>

**Highly rewarding stimuli such as food or drugs can also hijack the brain’s attention system and cue more automatic responses.**<sup>72-79</sup>

This can be seen in addictive behaviors (where brain systems shift away from important long-term goals to fill immediate cravings) or in instances of scarcity (i.e., when food is scarce, the appearance of any food draws attention more powerfully than when food is readily available).<sup>80</sup> How the brain responds to stimuli that are perceived as rewarding—and how quickly it responds—has important implications for parenting.

In one brain imaging study,<sup>81</sup> substance-using mothers showed reduced neural activation in response to infant cries and facial expressions, suggesting that substance use may change the brain in ways that impair mothers’ ability to respond appropriately to their infants,

and may even affect whether their automatic response system notices the cues or deems them important. In another study, putting mothers who smoke in stressful situations where the source of the stress is child-related (e.g., a crying toddler) induced larger cigarette cravings than situations in which the source of stress was not related to a child (e.g., a siren).

**Frequently experiencing circumstances that seem beyond our control can lead to a low sense of self-efficacy—the belief that one is able to be an agent in improving one’s life.**

In circumstances of addiction, it is common for stress to drive people to seek familiar sources of comfort (the addiction) rather than to address the source of the stress. Addictive behaviors can also become linked to and reinforced by a specific stressor or environmental cue, resulting in increased desire in certain situations. So, in this case, the brain associates lighting up with hearing the baby cry, which initiates a new craving for a cigarette each time—even if it means attending to that craving delays attention to the source of the stress.

**Even without the addition of serious trauma, poverty can overload self-regulation, potentially as a result of a pile-up of stresses associated with trying to survive in the face of inadequate resources.**<sup>80,82-85</sup>

Frequent, stressful events (e.g., bills to be paid, needs that can’t be met, safety concerns) capture attention from other areas (e.g., planning, budgeting, getting a bank account). Directing attention to a crisis becomes habitual, while the ability to redirect attention in the face of such stimulation is not well practiced. Dealing with these unceasing demands can deplete the store of physiological energy required for self-regulation, and chronic stress has been shown to weaken the neural circuitry that connects intentional self-regulation to automatic responses.<sup>86-88</sup>

In other words, the multiple stresses that accompany poverty can overload the brain systems involved in decision-making.<sup>83-85,89</sup> Stress

compromises memory, makes it harder to consider different approaches to solving problems, and diminishes our capacity to weigh the future implications of current decisions. As a result, many who have been raised in conditions of significant stress—or who are currently undergoing acute stress—struggle to keep track of the multiple problems in their lives, analyze

those problems, explore options for dealing with them, and set priorities for how best to move ahead.<sup>1</sup> Stress also hijacks our good intentions and increases the likelihood that we will be swept away by our impulses or automatic responses.<sup>89</sup> So, even if we manage to develop a good plan, we will find it harder to stick to it if we are under a pile-up of stress.

## How Can We Build or Restore These Core Capabilities?

BUILDING THE CORE CAPABILITIES OF ADULTS is essential not only to their own success as parents and workers, but also to the development of the same capabilities in the children in their care. Doing this successfully requires

and benefits are logical and clear will help assure that services designed to support adults do not inadvertently become additional burdens. Materials should also be made more accessible by producing them in a variety of formats, using clear language, and breaking down tasks into steps. When possible, bundling services, funding streams, and applications from different agencies and providers can minimize the challenges of navigating multiple service streams and system silos. Allowing people to more easily re-enter programs by eliminating as many barriers as possible is also important.<sup>90</sup>

**Building the core capabilities of adults is essential not only to their own success as parents and workers, but also to the development of the same capabilities in the children in their care.**

attention to two different domains: building supports and reducing overloads in the service and home environments; and increasing the individual's own capabilities to deal with challenges. (For more details on specific program models referenced below, see page 17.)

**Pay attention to the style of interaction between caseworkers and those being served. Instead of caseworkers taking a punitive stance that conveys stigma, a coaching style of mutual respect, genuine listening, and concrete advice and support should be used.**<sup>91</sup> This approach reduces the emotional stress and threat inherent in these interactions and avoids cuing the threat response system, allowing participants to practice more intentional self-regulation. Considering ways to provide positive feedback will support positive moods and openness to opportunity, and create more predictability and order in interaction with adults.<sup>1</sup>

### Environmental Approaches

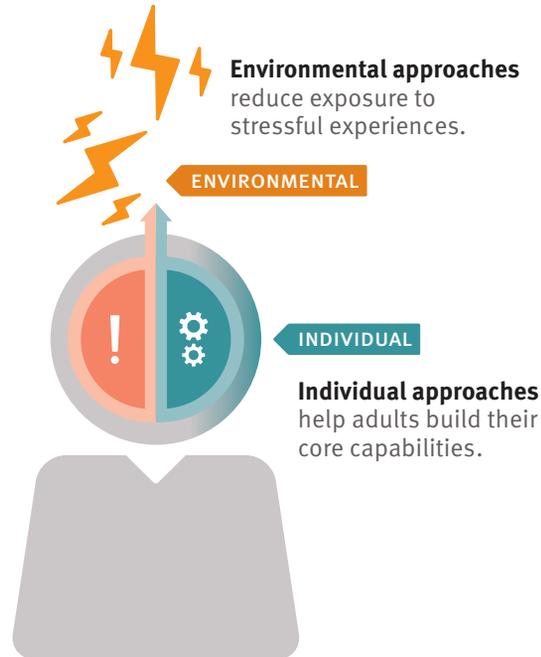
Modifying the environments in which adults live, work, and access services based on an understanding of executive function and self-regulation challenges means looking for ways in which those environments either facilitate or inhibit the ability to use or develop those skills. What changes can we make to programs and services that will create a less stress-inducing environment for people whose core capabilities are challenged? How can we provide positive opportunities to develop and practice those skills?

**Incorporate tools and techniques that help people take greater advantage of available services and build core capabilities.**

**Reduce the ways in which systems and services that are designed for adults living in poverty overload and deplete their self-regulation skills.** Streamlining and combining materials, processes, and procedures so that applications for programs

Examples include relating content to individual needs, creating organizational tools such as checklists and reminders that will help people manage the demands on their lives, and breaking down tasks into incremental steps. Put technology to work assisting adults with plan-

**Two approaches can reset the balance of self-regulation in adulthood.**



ning by sending text reminders about upcoming appointments, deadlines, or classes.<sup>92-94</sup> The best examples not only ensure that the services improve their uptake, use, and retention, but also introduce common tools that augment core capabilities at the same time that they scaffold practicing the underlying skills.

**Use service delivery infrastructure to relieve key stressors in families' lives by filling basic needs.** Examples will vary according to the context of the service, community, and population served, but may include offering diapers, financial services, child care, transportation, or low-interest emergency loans. These may have little to do with the primary service being provided, but by reducing the burden of stress caused by whatever is scarce in people's lives—be it time, cash, or basic supplies—they allow clients to focus on the important matters at hand. Services that reach large populations of people dealing with various forms of adversity have a vital infrastructure that could be used more effectively to reduce the causes of stress in people's lives.<sup>90</sup>

### Individual Approaches

We can also help adults improve their core capabilities at the individual level. What can we do to help adults who have faced adverse con-

ditions throughout their lives to build their self-regulation and executive function skills?

**Provide training in specific self-regulatory and executive function skills aligned to the environment and context in which they will be used.** A parent trying to cook dinner with a baby crying and the phone ringing draws upon key emotional and cognitive regulation resources in order to remain calm. Preparing for specific situations like that can help adults: (1) be aware that a situation calls on regulation (e.g., because it evokes irritability, frustration, sadness, or fear); (2) regulate the feeling or thought (e.g., through “stop and think” or mindfulness techniques); and (3) manage the goal through a problem-focused coping strategy (e.g., prioritizing, postponing the least urgent task, etc.).

There is emerging evidence that providing caregivers with specific behavioral tools aligned to these situations, such as identifying triggers for awareness of the situation and using mindfulness approaches to slow down the response, can improve parent-child relationships, reduce frustration, and boost cognitive control. And, while training discrete skills such as inhibitory control and working memory outside the context in which they will be used (e.g., through computer games) has been accomplished with some success,

these efforts do not always transfer to other contexts.<sup>49,95-104</sup>

**Teach strategies for reassessing a stressful situation and considering alternatives. Such strategies, when practiced in the context of safe, supportive interventions, show potential for preventing automatic responses from undermining effective self-regulation.** For example, teaching and practicing strategies that help us change our motivational framing of a situation, affirm a core value, or simply believe that we can control our actions can all enhance self-regulation.<sup>105-110</sup> Imagine that a co-worker cuts in line during a lunch break. One response is to think that this person is rude and trying to get ahead of you, which might trigger anger and aggression. Using reappraisal strategies learned through consultation and practice, you might shift your thinking to other explanations—perhaps the person just didn't see you. With this alternative way of

impaired by brain injury, substance abuse, or ADHD has improved sustained attention and planning. Mindfulness training (techniques for being more aware of one's reactions) can improve working memory and reduce reactivity to emotional stimuli and anxiety. For parents, being more aware of one's frustration while interacting with a child can reduce reactivity and improve the quality of their relationship with the child.

*Attention bias modification training* is a promising approach for retraining the brain to focus less on negative situations, resulting in reduced anxiety and greater emotional and behavioral control.<sup>111-118</sup> In the example of being cut off in a lunch line, we might simply redirect our attention to what we want to order for lunch. Desensitizing individuals to automatic associations with certain situations—such as the heightened stress one feels in a setting where one has previously experienced violence or confrontation—can help behavioral responses become less emotional and more intentional. In the case of intimate partner violence, the home can be such a place even when there is no longer a threat of violence there. Defusing the anxiety experienced simply by being in the home where violence occurred can be an important step in reducing the impact of the stresses of everyday life.

## Helping adults recall positive memories or see themselves with positive identities can help improve cognitive performance and willingness to participate in programs.

framing the situation, anger can be reduced and a polite request that he or she go to the end of the line may be all that is needed.

Activities that are seen as effortful can also be reappraised. For example, filling out a job application might be seen as an opportunity for improving your income, or getting children ready for school can be thought of as an opportunity to play “grown-ups” together. Such reappraisal techniques can actually reduce the depletion of self-regulatory abilities and heighten motivation to engage in the activities.

**Teach strategies for recognizing and interrupting automatic responses to give more time to activate intentional self-regulation in stressful situations.** For example, feeling intense anger might become a “stop and think” trigger to take a deep breath and remember long-term goals before responding. Training in similar approaches with adults and adolescents

**Strengthen intentional self-regulation through specific training techniques that target the skills that can override automatic responses.**

- *Cognitive behavioral therapy* helps people identify stressors or threats, monitor and reduce their own arousal, and select proactive coping strategies that can be realistically executed in the heat of the moment.<sup>119</sup>
- Interventions with teen parents that focus on goal-setting, monitoring, and reflecting have been successful at improving self-regulation in the short term and have also yielded some long-term health benefits, including changes in markers of inflammation.<sup>120,121</sup>
- *Motivational interviewing* identifies and mobilizes the client's intrinsic values and goals to stimulate behavior change. The counselor's task is to facilitate expression

of both sides of the client's ambivalence toward achieving a goal and to guide the client to an acceptable resolution that produces change, in part by avoiding situations that trigger problematic emotions of fear and craving.<sup>122</sup>

- Training in decision-making can help to regulate impulsive and unwanted behavior. For example, in creating an action plan, a goal is identified and behaviors are broken down into subcomponents that support initiating action, planning for barriers, and dealing with conflicting demands on time and attention.<sup>123-126</sup> A critical component of these approaches appears to be identifying goals that are intrinsically motivating to the subject. This suggests a fundamental mindset shift for social services from making people do what they are supposed to be doing (e.g., get a job) to supporting the identification and pursuit of self-identified goals (e.g., what type of job would you like to have and how can we help you get it?).<sup>124,127-129</sup>

**Create a “multiplier effect,” in which small successes lead to ever-increasing use of**

### **intentional self-regulation and a reinforcing cycle of positive emotional responses.**

Over time, a series of seemingly uncontrollable events and situations can erode or even obliterate the sense of agency—the belief that one's actions will make a difference. Even small shifts in mindset can help. For example, students may engage in writing exercises to change their concept of themselves as learners, which helps them to manage emotions of anxiety and fear and build effective coping techniques.<sup>130-133</sup> This helps students feel that they belong at school, reinterpret challenges as less threatening, and begin to think more about the future, which can be an important component of intentional self-control.

Similarly, helping adults recall positive memories or see themselves with positive identities can help improve cognitive performance and willingness to participate in a program. A parenting coach could, for example, encourage adults to remember a time when they felt proud as a parent or to think of themselves as their child's earliest teacher. This gives them a positive place to start, instead of feeling like they have failed as parents because they need to take a parenting class.<sup>90</sup>

## Implications for New Strategies in Policy and Practice

GETTING OUT OF POVERTY REQUIRES PEOPLE to manage very complicated lives, optimize decision-making, and persevere in the face of huge odds. At the same time, poverty itself layers on severe stresses that can overload people's ability to develop and sustain their core capabilities.<sup>1</sup> For families who have become involved with the child welfare system, these stresses are magnified due to the prospect of potentially losing a child, the wrenching sense of failure as a parent, and the bewildering (and often confrontational) involvement of caseworkers, judges, and police.

These kinds of adverse experiences, and the stresses of poverty in particular, can compromise both a child's development of core capabilities and an adult's use of them in three distinct ways:

- When the self-regulation system is overloaded by the high demands of poverty, the capacity to use the skills that are needed

most to move forward and escape significant economic insecurity is reduced.<sup>1</sup> The challenges and stresses that typical adults and families face every day are already a challenge to the self-regulation system. In situations of poverty, psychologically depleting events are more common and there is often less support to deal with them.

- Experiencing serious adversity early in life without support from adult caregivers overdevelops the regions of the brain that are used most frequently in threatening, stress-inducing situations (i.e., “bottom-up,” automatic responses).<sup>56,57,62,63</sup> By directing physiological energy preferentially toward the development of these areas of the brain, these experiences redirect energy *away* from building the top-down, intentional regulatory skills needed to control them.<sup>58-61,134-137</sup>

- In adulthood, having overdeveloped automatic responses and underdeveloped intentional regulation leads to a self-perception of ineffectiveness and powerlessness *and* a sense that the world is a threatening place that is beyond one's control. That perception makes it even more difficult to draw upon an already-overloaded self-regulation capacity.

the very experience of raising children in poverty. At the same time, they can focus on developing and strengthening core capabilities on an individual level. In this paper, we've described many different training techniques, therapies, and interventions that have been shown to change adults' negative thinking, teach them to regulate intense emotional responses, boost their belief in their ability to change, and more. But these are just the starting point.

The ideas and efforts of every stakeholder—catalyzed by a shared knowledge base—are needed to design policies and deliver services that: (a) demonstrate an understanding of the neurobiological and psychological challenges facing the adults who are trying to access these services; (b) directly reduce the sources of stress in the lives of families in poverty; and (c) encourage the initial development of executive function and self-regulation skills beginning in early childhood.

Transforming current best practices requires a willingness to create new theories of change based on both scientific knowledge and practical experience in the field. It requires taking risks driven by rigorous measurement of what works (and doesn't) for whom, in order to understand why. It requires a continuous cycle of learning and improving. Reducing the intergenerational transmission of poverty, transforming the lives of adults and children facing adversity, and ultimately strengthening our society and economy require nothing less.

## Having a better understanding of the physiological, psychological, and self-regulatory toll of adversity and poverty can help policymakers and practitioners approach solutions to persistent social problems in new ways.

Having a better understanding of the physiological, psychological, and self-regulatory toll of adversity and poverty can help policymakers and practitioners approach solutions to persistent social problems in new ways. These could include strategies to reduce or eliminate the pile-up of multiple sources of stress, from housing to transportation to banking to basic needs like nutritious food and diapers. They can make applying for and accessing services less taxing on parents' executive function skills since these skills are already being depleted by

We would like to thank the many members of the **Frontiers of Innovation (FOI)** community who contributed to this paper, and whose belief in the importance of core capabilities led us to create it.

FOI is the Center on the Developing Child's R&D platform, designed to accelerate the development and adoption of science-based innovations that achieve breakthrough impact at scale. Launched in 2011, FOI employs a structured but flexible model that facilitates idea generation, development, implementation, testing, evaluation, and rapid-cycle iteration. This process is grounded in science and supported within a growing community of change agents who are committed to shared learning, cumulative knowledge, and transformative child outcomes at the population level.

The FOI community includes a diverse portfolio of on-the-ground projects that are aligned under a common theory of change focused on helping adults build their core capabilities—in order to achieve breakthrough outcomes for the children in their care.



## Training Techniques: A Closer Look

**Attention bias modification training (ABMT)** is a relatively new approach that helps people regulate their anxiety levels by training the brain to avoid focusing on anxiety-inducing objects or circumstances. Everyone has his or her own unique attention bias. Upon entering a room, people's attention automatically goes to different objects or situations based on their attention bias. For example, if someone is particularly neat in his own habits, his attention may immediately go to scattered papers on a table. For people facing high levels of stress or anxiety, their bias tends to direct their attention to perceived or real threats in the environment. ABMT uses repetitive computer models and games to train people to divert their attention away from negative messages or stimuli and toward more positive ones. The approach targets a specific attention bias and the specific part of the brain associated with it. Results have been seen in as few as eight 15-minute sessions or less than two hours of therapy.<sup>138,139</sup>

**Cognitive behavioral therapy (CBT)** is a practical, hands-on technique that helps people identify their problematic thoughts, images, and feelings and see how they are connected to self-destructive or negative behaviors. Working with a therapist in weekly sessions over a relatively short period of time (e.g., 4-7 months), people learn to use more constructive ways of thinking that result in healthier behaviors and attitudes. First, the therapist and client decide together which stressful or problematic situations to focus on. Then, the client learns to become aware of his or her thoughts, emotions, and beliefs about those situations and to identify which thoughts are negative, exaggerated, or even inaccurate. Finally, through in-session and at-home practice, the client learns to challenge and question those negative or inaccurate thoughts and avoid the resulting negative behaviors. CBT cannot eliminate unpleasant situations from people's lives, of course, but the technique teaches them to take control of how they cope with those situations, empowering them to feel better about themselves and their lives.<sup>140-142</sup>

**Reappraisal** (also known as cognitive reappraisal or cognitive reframing) is a technique that helps people change the way they assess a situation and redirect their thoughts before they have an intense emotional response, which can become too focused (e.g., feeling only anger

or fear) and result in a destructive negative feedback loop. Through therapy, people learn to use an active coping strategy and quickly make a positive yet realistic reassessment of what they initially see as a negative situation. They can even learn to see the positive long-term results of a negative situation. For example, a person could view being laid off from a job as an opportunity to find a position with better hours or a location closer to home. This strategy helps decrease stress and anxiety levels in the face of difficult situations and enables people to have more control of their emotional responses. Reappraisal involves three important steps: (1) recognizing negative thoughts as soon as they come to mind without giving them time to fester, (2) reappraising the situation and imagining a positive outcome, and (3) redirecting thoughts and focus toward the positive results. Ultimately, people learn that there is almost always more than one way to make sense of a situation and that it's possible to take a different perspective and avoid intense emotions.<sup>143-151</sup>

**Motivational interviewing** is a method of changing people's behavior by helping them see the discrepancies between their current behavior and their personal beliefs, values, or goals for the future. Results can sometimes be seen in as little as one therapy session. This technique can be effective when a person is ambivalent about or resistant to changing his or her behavior. In motivational interviewing, a therapist must be seen as a trusted, empathetic resource who doesn't coerce, argue, or judge. Using reflective listening, therapists can show empathy for and acceptance of a client's situation, without necessarily agreeing with the situation or behavior. A therapist must first understand the client's perspective, feelings, and values before he or she can begin to help the individual focus on discrepancies. Through gentle persuasion, the therapist helps the client see the discrepancies (and possible consequences) between his or her values and behaviors, which then motivates the individual to change. In motivational interviewing, the client must be the one to voice the reasons and arguments for change. A therapist will help the client see how his or her life could be improved and help figure out ways to make that a reality, but the client must convince him- or herself that the change is necessary and that he or she is capable of making those changes.<sup>152</sup>

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