# Self-Regulation and Toxic Stress Report 4:

Implications for Programs and Practice

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# OVERVIEW

Self-regulation has become recognized for its foundational role in promoting wellbeing across the lifespan including physical, emotional, social and economic health and educational achievement.  There is also growing understanding of how early adversity can create tremendous challenges in developing and achieving optimal self-regulation, making children and youth vulnerable to a range of negative, lifelong health and mental health difficulties.  Moreover, there is growing evidence for how chronic stressors like living in poverty contribute to toxic stress, creating biological changes that correlate with self-regulation difficulties.  Fortunately, evidence suggests that interventions focused on skill instruction, caregiver (i.e., parents, teachers, mentors, or program staff) support, and environmental context can reverse these effects and improve long-term outcomes.  Our comprehensive intervention approach described in this report builds upon a broad empirical literature using a well-developed theoretical framework, with the goal of informing child development and family support services that seek to invest in society by strengthening self-regulation in the most vulnerable populations.

This report is the fourth and final in a series entitled *Self-Regulation and Toxic Stress*. The first three reports in this series laid out an applied framework for self-regulation development (http://www.acf.hhs.gov/opre/resource/self-regulation-and-toxic-stress-foundations-for-understanding-self-regulation-from-an-applied-developmental-perspective, described the effects of toxic stress on self-regulation development (http://www.acf.hhs.gov/opre/resource/self-regulation-and-toxic-stress-a-review-of-ecological-biological-and-developmental-studies-of-self-regulation-and-stress), and reviewed the existing interventions for youth from birth through young adulthood (http://www.acf.hhs.gov/opre/resource/self-regulation-and-toxic-stress-report-3). The goal of this final report is to **provide practical implications of this work for programs and populations relevant to the Administration for Children and Families** (ACF).  In this report, we first review key concepts for understanding self-regulation in context, including the relationship between stress and self-regulation. Next, we summarize key findings from our comprehensive review of self-regulation interventions, including the types of self-regulation interventions that have been evaluated, the types of populations that have been studied, and the strength of evidence for different types of outcomes for different ages. Finally and most importantly, we address how our current theory and knowledge of self-regulation may apply to different ACF programs, including those children and families living in adversity.  For each developmental group examined from birth through young adulthood, specific considerations for key strategies and program elements are provided on separate pages that can be pulled out for review.

The key points from this report are as follows:

**A variety of self-regulation interventions result in meaningful positive effects on cognitive, emotional, and behavioral self-regulation as well as broader outcomes across development like mental health and academic achievement**.  However, results are quite variable, with many interventions failing to find significant effects.  There are also many gaps in the current evidence base for self-regulation interventions, and more research and development is needed.  In particular, there are many areas where interventions could be enhanced using some of the guidelines and considerations in this report. For example:

- Provide a more intentional and targeted focus on self-regulation, where cognitive and emotional regulation skills and their integration are systematically taught.

- Increase the focus on developing emotion regulation skills during adolescence.
- Provide support for caregivers' own self-regulation so that they can meet the self-regulation needs of vulnerable children and youth.
- Teach caregivers (e.g., parents, teachers, mentors, or program staff) of children and youth of *all* ages to model, coach, reinforce, and support self-regulation skill development within the context of a warm and responsive relationship and positive behavior support skills.  We call this process "co-regulation" training.

**Many promising intervention approaches exist for supporting self-regulation development that could be incorporated into existing ACF programs**, including many evidence-based parenting programs as well as direct skills instruction with children and youth.  Comprehensive self-regulation interventions would include:
- Interventions combining skills instruction and co-regulation training,
- Interventions provided across development and settings,
- Self-regulation coaching for children and youth of all ages, and
- Support for caregivers' (parents, teachers, mentors, and program staff) own self-regulation capacity.

**Care is needed in selecting those that may be a good "fit" for relevant populations and settings** in addition to impacting outcome domains of interest.  Specific programs should also be selected carefully given considerable variability seen in outcomes.  Additional implementation considerations include:
- Training program staff in how self-regulation develops so they can effectively model it, teach it, and coach it in everyday practice situations for children and youth
- Utilizing best practices suggested from implementation science including gaining "buy-in" from frontline staff.

**Given the profound impacts that self-regulation can have across areas of functioning into adulthood, and given that no single intervention is likely to achieve lifelong self-regulation goals, we suggest a self-regulation framework to support the wellbeing of children and families living in adversity.** The first step is to work towards decreasing environmental stressors that can negatively impact self-regulation development.  Next, universal interventions should be embedded in settings such as schools, which may shift self-regulation development in the overall population and be particularly beneficial for youth who live in adversity or are at-risk.  Finally, children and youth most at-risk are likely to experience the greatest benefit from early intervention.  However, should this opportunity be missed, evidence suggests that interventions for at-risk middle and high school youth can be particularly beneficial.

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# A Review of Key Concepts for Understanding Self-Regulation in Context

Before describing specific strategies and program considerations it will be helpful to review some of the key concepts for understanding self-regulation that are addressed in the first two reports in this series subtitled *Foundations for Understanding Self-Regulation from an Applied Developmental Perspective* and *A Review of Ecological, Biological, and Developmental Studies of Self-Regulation and Stress*. Most importantly, **self-regulation serves as the foundation for lifelong functioning.** It has robust and pervasive effects across a wide range of domains, from mental health and emotional wellbeing to academic achievement, physical health, and socio-economic success. Establishing a foundation for these lifelong benefits during childhood and adolescence benefits communities and society as a whole by strengthening the workforce, increasing economic stability, and reducing costs for human services, medical care, and the justice system. In addition, **self-regulation has proven to be responsive to intervention, making it highly relevant for program developers and policy-makers.** Thus, promoting self-regulation development appears to be a wise investment for the future prosperity of society.

## An Applied Definition of Self-Regulation

Many different terms have been used to describe one's ability to manage emotions, impulses, and behavior. These include "willpower", "grit", "self-control", "executive control", "executive function," "effortful control" and "self-management". Self-regulation is an umbrella term that encompasses all of these and has unique characteristics that support application to practice. More specifically, self-regulation is based on multi-disciplinary work, it implies a broad range of abilities beyond simply controlling impulses, and suggests flexibility and adaptability in response to situational demands and social norms. Self-regulation is related to resilience, coping, and stress management; however, these are considered separate constructs. It also shares some similarities with conceptual models used in programs supported by the Administration for Children and Families. For example, self-regulation is a critical protective factor that supports children's well-being in adverse situations including domestic violence. Self-regulation can be defined from an applied perspective as follows:

> Self-regulation is the **act of managing one's thoughts and feelings to engage in goal-directed actions** such as organizing behavior, controlling impulses, and solving problems constructively.

Self-regulation includes cognitive and emotional skills and processes, which interact to provide the foundation for behavioral regulation. Lack of self-regulation is manifested in a range of difficulties with great relevance for programs and practice, including impulsive, aggressive behavior, attentional difficulties, self-harm, and engagement in risk behaviors such as substance use.

## Importance of an Ecological Framework

**The act of self-regulating is dependent upon specific environmental and contextual supports that are ongoing, as well as factors that are specific to a child or youth.** This process, whereby an individual is embedded within a larger ecology, is depicted in Figure 1 below.

*Figure 1. Factors Contributing to Self-Regulation Enactment*
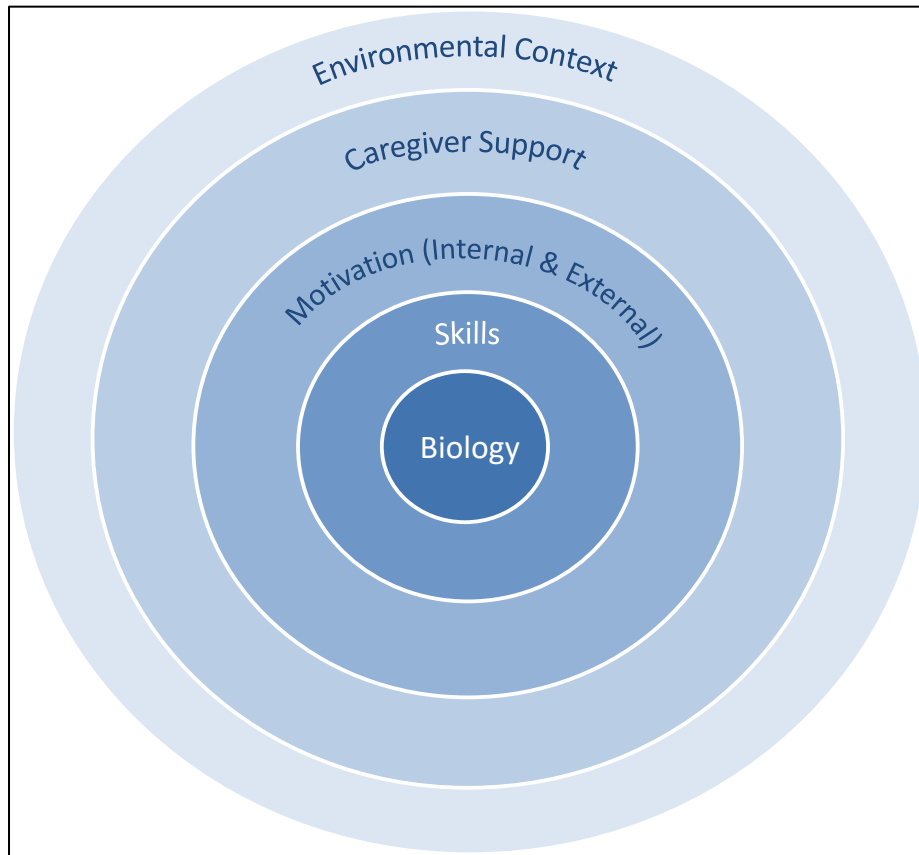


The most internal factor influencing a child's capacity for self-regulation is the child's *biology, genetics, and temperament*, which contribute to individual differences in self-regulation. The next major influence shown in the figure is the *self-regulation skills* that the child or youth develops over time, which are often targeted by interventions. Importantly, however, skills are necessary but not sufficient for the enactment of self-regulation. Next is an individual's *motivation* to self-regulate, which can be derived from either external sources (e.g., rewards and consequences) or internal goals and values (i.e., intrinsic motivation). Motivation interacts with skills in different ways. For example, children with adequate self-regulation skills may fail to self-regulate at times due to lack of motivation, or those with a high level of motivation may lack the necessary skills to self-regulate.

**Skills are a necessary but not sufficient component of self-regulation. Also critical is caregiver support and the environmental context.**

*Caregiver support* (provided by parents, teachers, mentors, or program staff) is critical to the development of self-regulation in children, as depicted by the next layer in our model. Caregivers can strengthen children's self-regulation by modeling, teaching, coaching, and reinforcing specific skills within a warm, responsive relationship with positive behavior support strategies; they can also buffer them from adverse experiences in the larger environment. Finally, the *environmental*

*context,* including the demands or stressors placed on an individual as well as the external resources available, also has a significant influence on one's ability to self-regulate.  It is important to note that all these factors interact with each other across levels.  In sum, self-regulation occurs through dynamic interactions between an individual and the environment; and **for children, the most critical component of the environment is relationships with caregivers** (i.e., parents, teachers, mentors, or program staff)**.** For more information on a model of self-regulation in context, visit: http://www.acf.hhs.gov/programs/opre/resource/self-regulation-and-toxic-stress-foundations-for-understanding-self-regulation-from-an-applied-developmental-perspective .
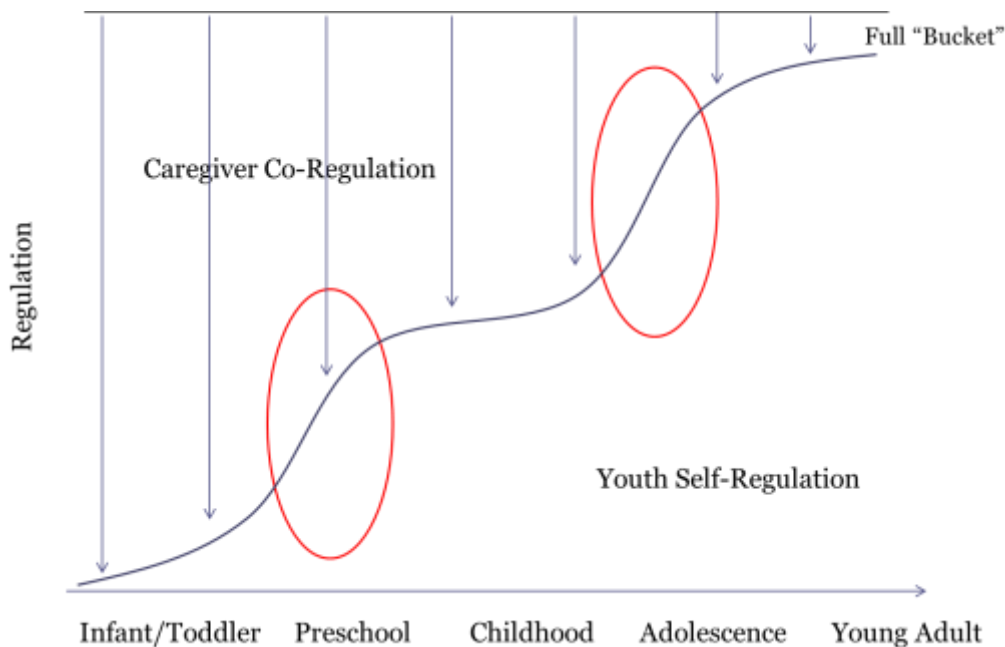
### Development of Self-Regulation:  It doesn't just "happen"

This ecological framework provides a lens for understanding self-regulation interventions across development.  It is also important to understand a few key ideas about how self-regulation develops within normative contexts where children and youth experience manageable and developmentally typical self-regulation demands.

- **Self-regulation develops over an extended period from birth through young adulthood** (and beyond).  Although self-regulation can look very different at different ages, there is a pattern of development across cognitive, emotional, and behavioral domains in which skills build upon each other and become more complex over time as environmental demands and expectations requiring self-regulation increase.

- **There are two clear developmental periods where self-regulation skills increase dramatically** due to underlying changes in brain architecture—early childhood and adolescence—suggesting particular opportunities for intervention.

- **Self-regulation can be strengthened and taught like literacy, with support, instruction, reinforcement and coaching provided from caregivers** (i.e., parents, teachers, mentors, or program staff).  Similar to literacy, self-regulation development starts with simpler skills that build upon one another and require developmental scaffolding across time so that new skills are not introduced until foundational skills are mastered.  It also requires repeated practice with frequent feedback in a supportive context.  And although skills may develop earlier in environments with stronger foundations of support, all people have the capacity to develop these skills with effective instruction, suggesting multiple opportunities for intervention across development.

- **Self-regulation develops in the context of social relationships and is dependent on "co-regulation" provided by parents or other caregiving adults**.  Co-regulation is defined as an interactional process in which a caregiver (i.e.,  parent,  teacher, mentor, or program staff) provides support, coaching, and modeling that facilitates a child's ability to understand, express, and modulate their feelings, thoughts, and behavior.  In co-regulation, caregivers provide the nurturing, instruction, coaching, and support that will promote optimal self-regulation by the child, while simultaneously buffering against environmental stressors that might diminish regulatory capacity.

In Figure 2 below, we present a theoretical model of child self-regulation relative to co-regulation provided by caregivers (i.e., parents, teachers, mentors, or program staff) across different ages. We are not specifying the exact ratio of child to caregiver regulation, as this varies for different children at different times.  Rather, we are describing a normative trajectory in child capacity vis-à-vis need for caregiver support.  One way of thinking about this ratio is that, for optimal self-regulation in a given moment, a child or adolescent needs to have a full "bucket" of skills and supports from which to draw. For this analogy, imagine that regulation of emotion, cognition and behavior can only be successfully enacted if a "bucket" holding accumulated biology, skills, motivation, caregiver support, and environmental support is filled to the top. Depending on developmental stage, environmental circumstances, and individual differences, children themselves have the capacity to fill their self-regulation bucket to varying levels.  However, for optimal functioning, they require caregivers to provide co-regulation that fills the remainder of the bucket.



Figure 2.  Co-Regulation between Caregivers and Youth across Development

## Impact of Stress on Self-Regulation

We now consider how stress may derail the development of self-regulation, with the expectation that in situations where stress is overwhelming for a child, he or she would need to obtain assistance and support in order to self-regulate.  **Self-regulation can be disrupted by prolonged or pronounced stress and adversity including poverty and trauma experiences**.  Although manageable stress may build coping skills, chronic or severe stress that overwhelms children's skills or support can create toxic effects that negatively impact development and produce long-term changes in neurobiology (for additional details, see the second report in this series entitled *A Review of Ecological, Biological, and Developmental Studies of Stress and Self-Regulation* which can be found at

).  A few key points are worth highlighting:

- **Individuals vary in their responses to adverse experiences as a result of complex interactions among genes/biology and the environment**. Children and youth have characteristics that may make them either more resilient in the face of stressors, or more vulnerable.  The nature of the stressors as well as the presence of protective factors in the environment and the child's own coping skills may also impact their stress responsivity.  Thus, different children will respond differently to similar stress experiences.

> **Build Self-Regulation like Literacy**
>
> Start with simpler skills that intentionally depend upon one another
>
> Provide scaffolding across development so that new skills are not introduced until foundational skills are mastered
>
> Provide repeated practice with frequent feedback in a supportive context

- **Previous exposure to stressors may sensitize a child to have more difficulties self-regulating when faced with stress later.**  In dangerous, unpredictable environments, this heightened stress reactivity can be adaptive for survival. However, youth who live in conditions of adversity can experience tremendous challenges in developing and achieving optimal self-regulation to function in normative settings such as school or work.  Likewise, the neurobiological changes that accompany heightened stress reactivity make these youth vulnerable to a range of negative, lifelong health and mental health difficulties without intervention.

- **There is evidence that environmental changes have potential to reverse negative stress effects and change developmental trajectories**, consistent with our understanding that self-regulation is malleable.  In particular, positive parenting practices appear to be a strong buffering factor that mitigates the impact of stress on children, and placing maltreated children in supportive environments is associated with self-regulation improvements.

## A Comprehensive Developmental Approach to Scaffold Interventions across Time and Settings

In sum, self-regulation interventions should support the development of increasingly sophisticated skills, integrating emotional regulation with cognitive regulation across more complex social situations with less and less external support over time.  Self-regulation interventions should therefore focus on different skills at different ages, just like literacy.  And like literacy, we would not expect that any single, brief intervention would provide the comprehensive skills that a child or youth needs for adulthood. Given the long-term nature of self-regulation development, **developmentally-appropriate and culturally-sensitive interventions should be delivered across a range of programs in a purposeful and systematic way across several years**.

Our model also suggests **that both universal and targeted interventions are needed to promote self-regulation development and prevent significant problems related to self-regulation difficulties**.

Universal interventions are generally provided to all children or youth in a certain setting (such as a school or grade), regardless of their individual characteristics.  In such settings, all children may be at-risk due to poverty or other conditions of environmental adversity, making preventive intervention highly relevant.  This level of intervention is particularly appropriate for addressing environmental conditions that create chronic stressors for children.  In contrast, targeted interventions are provided to specific children or youth who are selected to participate in an intervention for a particular reason, usually related to their individual level of risk.  This risk could be defined by early difficulties being demonstrated that do not yet reach the level of clinical diagnosis, or by specific family risk factors such as having divorced or substance using parents.

Co-regulation support provided by parents, teachers, or "coaches" should also be provided from birth through young adulthood, although different levels of support may be needed for different children at different ages and in different contexts.  Adolescents, whose self-regulation needs have received minimal attention in research and program development as compared to early childhood, seem to warrant particular intervention support to address unique developmental risks and neuro-biological opportunities for change.  Our guiding principles for interventions based upon our conceptual model are summarized in Box 1.

This conceptualization suggests a comprehensive developmental approach to thinking about the populations ACF serves and the services they receive through their interactions with ACF programs. Because ACF's programs serve the most vulnerable children and families (e.g., those who experience early and continued adversity) and given the fundamental role of self-regulation for healthy development and its responsiveness to intervention, it seems that the children and youth ACF assists would be well-served if the full range of programs they experienced were designed to help build self-regulation.  Moreover, given some children are served by many ACF programs over the course of their childhood and youth (e.g., Head Start, foster care, employment), it may be helpful for interventions in ACF programs to be designed across ages and settings to provide consistent structure, instruction, support, and reinforcement or coaching that is designed to build similar capacities within children overtime as they grow and develop into self-sufficient adults.  Towards this aim, an important question to ask is:  **What would a comprehensive self-regulation development approach look like that could be *scaffolded* across the programs that serve ACF target populations?**  Thinking of this as a scaffold means that it supports the actions and attitudes of staff, supervisors and services in a shared and mutually-reinforcing way over time. In the remainder of this paper, we provide suggestions on what that might look like as we review the findings from the previous three reports and apply them to ACF populations and programs.

The suggestions made in this report have been informed and reviewed through an iterative feedback process with ACF staff that began with in-person conversations regarding the relevance of our applied model of self-regulation in February 2014.  The process of input, review and feedback continued with drafts of specific sections of the report, and is acknowledged in those specific sections below.   In addition, we would like to acknowledge the following individuals (listed alphabetically) for their participation in early discussions: Kiersten Beigel, Moushumi Beltangady, Jean Blankenship, Caryn Blitz, Melissa Brodowski, Jennifer Brooks, Amanda Bryans, Nancye Campbell, Kathleen Dwyer, Christine Fortunato, Rosie Gomez, Catherine Heath, Charisse Johnson, Earl Johnson, David Jones, Lauren Kass,

Marylouise Kelly, Deborah List, Resa Matthews, Joyce Pfennig, Brian Richmond, Emily Schmitt, Elaine Stedt, Lauren Supplee, Mary Bruce Webb, and Erica Zielewski.  Naomi Goldstein's review of the final

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**Box 1.  Guiding Principles for Self-Regulation Interventions**

**Universal Interventions**
- *Provide self-regulation interventions across development*
  - ★ Target both emotional regulation and cognitive regulation
  - ★ Address different skills at different developmental levels
  - ★ Deliver across a range of programs in a purposeful and systematic way, like strategies for promoting literacy
  - ★ Provide multiple opportunities for practicing skills within an every-day context
- *Focus on co-regulation from birth through young adulthood*
  - ★ Teach caregivers (e.g., parents, teachers, mentors, program staff) to provide responsive caregiving, environmental structure, and coaching support to children and youth
  - ★ Give caregivers instruction and support for using self-regulation skills in their own lives so they can more effectively teach and support youth to do so

**Targeted Interventions**
- *Target vulnerable children preventatively*
  - ★ Address chronic stressors that can add up to produce toxic effects  (e.g., living in poverty, experiencing trauma, or having multiple adverse childhood experiences)
  - ★ Provide vulnerable children with supports to cope with chronic stressors *early* – this may help *prevent* problems with self-regulation later
- *Focus on co-regulation from birth through young adulthood (as described above)*
- *Provide intensive intervention to children with self-regulation challenges*
  - ★ Interventions that provide support in coping *after* problems have emerged may help *reverse* negative effects

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document resulted in substantive contributions as well.

## Key Findings from a Comprehensive Review of Self-Regulation Interventions

A comprehensive literature review of self-regulation interventions is summarized in the third report in this series entitled *A Comprehensive Review of Self-Regulation Interventions from Birth through Young Adulthood*. Readers are encouraged to reference this report at http://www.acf.hhs.gov/programs/opre/resource/self-regulation-and-toxic-stress-report-3 for further details. Because the present report focuses on implications of this intervention review, we briefly review some of the key points of our approach and findings in this section.

Report 3 describes our methodological approach and provides graphical depictions and a listing of findings for the 299 interventions reviewed. Peer-reviewed studies published between 1989 and November of 2013 were identified from four databases using two lists of search terms (one with terms denoting some type of intervention and one with self-regulation terms). Studies were included if they 1) evaluated an intervention that explicitly targeted one of our two key theoretical mechanisms of self-regulation development (i.e., warm and responsive caregiving, direct instruction) *or* 2) included outcomes assessing cognitive, emotional, or behavioral self-regulation (with the caveat that studies measuring only behavioral self-regulation were not included unless they also met intervention criteria).

The two key theoretical mechanisms of self-regulation development used to characterize interventions in this review are as follows:

1. **Warm and responsive caregiving** (from a parent, teacher, or mentor), which includes providing developmentally-appropriate opportunities for self-regulation, modeling self-regulation, prompting and reinforcing self-regulation, and managing behavior effectively (i.e., "co-regulation").

2. **Direct skills instruction** in cognitive, emotional, and/or behavioral domains of self-regulation development, with developmentally-appropriate, coached opportunities to practice these skills.

The key methods of our analytic approach for Report 3 are summarized in Box 2 below. The broad goals of this review were to describe existing interventions that have been evaluated to improve self-regulation in universal or targeted samples and evaluate their impact across development. As the focus of this review was on prevention studies that have greatest relevance to ACF programs, we excluded treatment studies; that is, any study with a clinical sample defined by a specific medical or psychiatric condition. Similarly, we excluded interventions administered in a highly restrictive setting (e.g., prison) or where a clinical degree was required to deliver a program. The specific questions addressed in our review are as follows:

- What types of self-regulation interventions have been evaluated, with what populations, and in what settings?
- What is the strength of evidence for self-regulation interventions, by developmental group?
- How do effects vary by outcome domain?

Before considering the implications generated for programs and practice from Report 3, it may also be helpful to briefly summarize the research that was reviewed in that report.

## Characteristics of the Research Reviewed in Report 3

The vast majority of studies meeting criteria for this review examined interventions for children between the ages of three and twelve.  **The evidence base is limited for the youngest children (birth through age two), those in high school, and young adults (through age 25)**.

- **Males and females were equally represented in the studies.**

- **Of those studies reporting race and ethnicity, slightly more than half the participants were identified as either African-American or Hispanic; however, this diversity varied by age group.** In particular, the young adult studies included a majority of white youth, many of whom are attending college.

- **The percent of studies targeting participants living "in adversity"** (defined by poverty or other environmental risk factors such as being in foster care or having a divorced or substance abusing parent) or who were considered "at risk" on the basis of individual health or wellbeing characteristics **declined markedly with age.** That is, the majority of intervention studies for younger children targeted participants "in adversity" or "at risk", while this would apply to only the minority of high school or young adult studies.

- **Two-thirds of the studies were randomized controlled trials,** which provide the most rigorous level of evaluation by randomly assigning participants to either an intervention or control group.

- **About two-thirds of the studies were conducted in the U.S.;** most of the others were conducted in well-developed English-speaking countries.

- **Only about one-third of the studies reported on the fidelity of interventions delivered,** limiting interpretation of poor outcomes for studies where fidelity is unknown.

- Although not reported in many studies, **implementation supports were identified for the majority of interventions** with the exception of those for young adults. The level of reported implementation supports appears to decline with age.

## Characteristics of the Interventions Reviewed in Report 3

- **Intervention approaches varied considerably by age of participants**. For participants from Birth through Age 2, all the interventions were based in co-regulation. The percentage of studies including this component declines dramatically with age, such that no studies for high schoolers or young adults involve co-regulation. Direct skills instruction increases proportionally with age, starting during the preschool years and increasing to over 90% in high school and young adult studies.

- Across different ages, skills instruction interventions included **social-emotional curricula, problem-solving, conflict resolution, violence prevention, and at older ages, coping skills, leadership, and life skills.**

  o **For preschool and younger, many interventions involved parenting programs** based in social-emotional learning and attachment theory.
  o **For middle schoolers and older youth, intervention approaches became increasingly diffuse and variable**, although there was increased focus on cognitive and mind-body interventions.

- The majority of interventions across all developmental groups except Birth through Age 2 were considered "universal" in nature. For example, they may have been provided to all the children or youth in a certain setting (such as a school or grade) or to volunteers from a general population. A minority of interventions were "targeted," that is, they were provided to individuals selected from within a population due to their personal characteristics (e.g., disruptive behavior, foster care status, or depressive symptoms).

- A wide range of individuals were used to deliver interventions including teachers, other school staff, university staff, clinicians, and staff trained in a specific curriculum or specialty area. Interventions were also self-directed through technology, primarily for older youth. There is again considerable variability across developmental groups.

- The majority of interventions (except for the youngest and oldest developmental groups) were implemented in schools or childcare/preschool settings. Relatively few have been implemented in settings specifically serving youth living in adversity such as foster care, shelters, or group homes.

The key characteristics of the studies and interventions reviewed in Report 3 are summarized in Box 3.

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**Box 3. Summary of the Intervention Research Reviewed in Report 3**

- There is a large body of self-regulation intervention research which is generally rigorous in design, providing reasonable confidence in results. However, there is considerable variability in study quality as more broadly defined by things like sample size, methodology, measurement, and analytic methods used, with *less* rigorous studies showing more positive intervention effects.

- There is substantial variability in existing research with regard to sample composition and size, intervention approaches, outcomes assessed, and types of measures used (from self-report to parent and teacher ratings, and computerized or laboratory measures).

- Study participants include a fairly large representation of minorities and those living in adversity or at-risk (although there is some variability by developmental group). Thus, results should be reasonably generalizable to many of the populations served by ACF programs (with the exception of young adults).

- Many of the interventions that address self-regulation may be conceptualized as targeting social-emotional competencies, relationship and communication skills, anger management, and job skills training or "soft skills". However, interventions being used for adolescents are frequently more diffuse and less theoretically relevant than those used in early childhood, which may influence effectiveness.

- Both universal and targeted interventions exist and in some cases have been used together, providing models for our recommended approach. Schools are the most common setting for intervention.

- Existing interventions do not adequately address the following: 1) enhancing parent or teacher skills to support co-regulation after early childhood, 2) caregivers' own self-regulation needs, and 3) emotion regulation development during middle and high school.

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## Key Impact Findings from Report 3

Across all studies in Report 3 with a control group (approximately 2/3rds of the studies), there are several overall findings that apply across developmental groups but also some differences in impacts,

which are summarized here.  There are also some important general limitations, which impact the strength of the findings and their implications.

- On average, interventions have **small to medium effects on self-regulation as well as functional outcomes** across a wide range of measures.  However, there is considerable variability in effects across different interventions, with outcomes ranging from negative effects to no effects to large effects across domains.

    o Although there is some variability across ages, both cognitive and emotional regulation may be enhanced, depending on the intervention focus. This is important given that we think of these components as building blocks for behavioral regulation.

    o Positive effects are seen for both internalizing (depression/anxiety) and externalizing (impulsivity, disruptive behaviors) outcomes. Thus there are benefits not only for those children whose challenging behaviors typically garner adult attention and intervention, but also for those less likely to gain attention.

    o Benefits extend to other domains such as language, learning, delinquency, mental health, and interpersonal outcomes, underscoring the foundational role of self-regulation.

    o Outcomes improve on a range of measures from direct child assessment and self-report (for older youth) to parent and teacher report and biological measures, strengthening the validity of these findings.

    o Studies without a control or comparison group (that fail to account for improvements that may occur over time for children) reported more positive outcomes.  Therefore we excluded those from our effect size analyses and conclusions.

    o Although there are relatively few interventions that have been studied in settings that specifically serve youth living in adversity, general outcomes for such children and youth do not differ from those without such risk characteristics.  However, such populations may benefit from including both child skills instruction and co-regulation approaches.

- **Developmental differences** in impacts can be summarized as follows:

    o Across the range of interventions examined, those serving **younger children** demonstrated moderate to large effects for parenting outcomes and small to medium effects on all aspects of child self-regulation (cognitive, emotional, behavioral) as well as stress.  Functional improvements are also seen in attachment, learning, social competence, and mental health.  Moreover, classroom climate improves when teachers are targeted.

    o Across the range of interventions examined for **middle and high school youth**, positive parenting effects are seen when they are targeted (which is infrequent).  Small functional improvements are seen for health, mental health, and delinquency.  Cognitive regulation improves consistently and behavioral regulation improves in middle

school; however, emotion regulation does not improve.  This is likely due to the lack of attention to this domain in interventions for this age group, as well as a lack of targeted caregiver involvement (i.e., from parents, teachers, mentors, or program staff).

- o Across interventions examined for **young adults**, moderate to large effects are seen on cognitive and emotional regulation, stress and mindfulness.  Functional improvements are also seen for mental health.  However, these outcomes are qualified by a small number of studies, narrow sample characteristics, and an over-reliance on youth self-report measures.

- Some **general limitations** should be considered in interpreting these results:

- o Intervention effects should not be directly compared across developmental groups due to major differences in types of interventions, measures used, and the nature of self-regulation skills across development.

- o Several important outcome domains have not been well-assessed at different ages.  These include:  1) language for toddlers (which appears to have promising effects in a few studies), 2) stress during middle and high school (which is particularly important for at-risk youth), and 3) motivation/initiative, interpersonal outcomes and job performance for young adults.

- o As noted above, studies with less rigorous methods actually show more positive results, indicating that study quality should be considered in interpreting results. At the same time, findings may be constrained by small sample sizes and reduced power, measure limitations, or lack of fidelity of delivery of interventions.  Thus, the actual efficacy of some programs may be under-estimated.

## Report 3 Conclusions

Evidence supports the benefits of universal and targeted self-regulation interventions for children and youth who may be at risk for negative developmental outcomes.  Interventions generally result in meaningful positive effects on core self-regulation as well as a variety of functional domains.  However, there are outcome differences across developmental groups and considerable variability across interventions, suggesting that care is needed in selecting interventions to adopt one that may fit the setting and be effective for the outcomes of interest with the specific populations.  In addition, there appears to be considerable room for improvement in existing intervention approaches when we compare the interventions reviewed to what would be recommended based upon our theoretical model of self-regulation development (summarized earlier in this report).  In particular, we would recommend that interventions:  1) more comprehensively target emotional and cognitive self-regulation (and their interaction), 2) consistently teach co-regulation to caregivers of older youth (i.e., parents, teachers, mentors, or program staff), not just younger children, 3) be embedded within settings (as is done with literacy in schools), and 4) be provided across development and settings, particularly for youth who live in adversity or are at-risk.

# Implications for Practice and Policy

As a division of the Department of Health and Human Services (DHHS), ACF promotes the economic and social well-being of children, families, individuals, and communities (http://www.acf.hhg.gov/) through a broad array of programs in offices such as the Office of Head Start, the Office of Community Services, the Office of Family Assistance, the Children's Bureau, and the Family and Youth Services Bureau.  The theoretical self-regulation framework presented in Report 1 and empirical findings from Reports 2 and 3 in this series (summarized above) yield a number of implications for policy and practice.  It is important to note that considerations regarding **intervention approaches can be incorporated into existing programs rather than requiring new programs and interventions**.

The remainder of this report will discuss implications for program administrators and practitioners which are informed by theory, data from our empirical intervention review, and discussions with ACF program staff.  First, we consider setting and implementation factors that apply to a large number of programs.  Second, we consider programs that serve different age groups from birth through young adulthood as well as programs that specifically serve children who are at-risk or living in adversity.

## Setting and Implementation Considerations

To the extent that established intervention programs targeting self-regulation may be useful for ACF to adopt, the following setting and implementation considerations will be applicable.

**Need for implementation supports.**   Many of the interventions studied included supports such as manuals or curricula, standardized training, and coaching or supervision of staff who are implementing the program, particularly when younger children are targeted.  This suggests that such supports may be needed to obtain similar results in practice.  It is encouraging that so many programs have curricula available, as these may support consistent implementation.

**Staffing and Training Needs.** Our recommended intervention approach suggests that *program staff need to understand the development of self-regulation and be able to effectively model it, teach it, and coach it* in everyday practice situations for children and youth. This will likely require competent staff. This may be challenging in situations where staff expected to deliver curricula have low levels of education, or are highly stressed themselves (such as some early care or shelter care providers). However, lower levels of competency with self-regulation may be compensated by high-quality training and coaching (Fixsen, Blase, Naoom, & Wallace, 2009).  We provide specific suggestions for what such training and coaching might look like later in this report.

**Consider best practices from the field of implementation science when using existing programs.** Implementation science would suggest that implementation capacity, infrastructure, and best practices in service delivery of an evidence-based program are critical for the successful translation of science into practice (Blase & Fixsen, 2013).  These involve the following:

- **Building Capacity:**  Build readiness and "buy-in" from frontline staff as well as key stakeholders and organization leaders with a clearly articulated vision for how the intervention will address specific needs of the population of interest.  Provide support for local agencies or grantees to professionally develop their service providers to deliver the intervention with fidelity.  Create an

organizational climate that supports implementation of the intervention within the local agencies. Develop data systems that can support data-driven decision making for quality improvement.

- **Building Infrastructure:**  Identify and embed leadership and management roles within local agencies or grantee organizations.  Create "implementation teams" with three or more individuals whose responsibility is to carry out implementation activities (specified in the next bullet point) and who, as a group, possess expertise in both the intervention and implementation science.

- **Implementation Activities:**  Recruit and select staff with specific competencies to implement the intervention.  Provide high-quality expert training that is evaluated on an ongoing basis and used to inform specific coaching supports.  Provide materials needed for implementation.  Provide coaching from individuals with expertise in the intervention, who utilize observational data in their coaching, and whose coaching is evaluated for impact on providers' fidelity.  Evaluate the quality of delivery of the intervention on an ongoing basis.  Collect and analyze data on outcomes to be used in quality improvement cycles.  Share data reports both within the agencies and in the larger community of stakeholders.  Identify and address policy and practice barriers to effective implementation.

- **Adaptation issues.**  As noted, the majority of interventions identified were developed for use in schools and may need modification to transfer to settings with different characteristics like group homes or shelters or even to agencies that serve more targeted populations than do schools.  In other situations, programs may have been implemented with mothers but not with fathers or other caregivers like grandparents or foster care parents.  Similarly, a program may have been implemented by a teacher but not another type of caregiver like a "job coach" or mentor.  Simply because an intervention has not yet been studied with a specific population or in a specific setting does not mean that it may not have benefit.  However, it does warrant careful study either through further research or use of continuous quality improvement data to maintain fidelity of the evidence-based intervention and inform changes when needed to achieve desired impact.

## Schools as an Implementation Setting

Although schools are not typically targeted directly by ACF, ACF does partner with the Department of Education and ACF grantees often partner with education systems in their states.  As noted above, our literature review of preventive self-regulation interventions indicated that **the majority of published interventions are being implemented in schools.**  Given that almost all youth between 5-18 years attend school, schools are an ideal setting for universal interventions and also offer many opportunities for implementation of targeted interventions.  School-wide supports that improve the culture and climate of schools may have particular benefits for youth living in adversity.  Thus, partnering to provide interventions in schools would appear to have many benefits for the populations ACF targets.

**Schools have several advantages as an implementation setting:**

- School implementation allows for building skills across ages in a cohesive intervention approach from preschool through elementary and secondary schools.

- Universal interventions in schools may impact the school climate and culture, which may then further support self-regulation development.  For vulnerable populations in particular, this may increase resilience to negative stress effects experienced in other contexts.

- Implementing interventions in schools provides shared learning and practice opportunities for a student with his/her peers, which may be a particularly powerful learning method for adolescents especially.

There are also **challenges to implementing self-regulation interventions in schools,** requiring creative strategies to address.

- Given that schools' primary focus is on student achievement, any non-academic program or intervention may require justification of the staff and student time and resources needed. Fortunately, there is evidence from our intervention review (see Report 3: *A Comprehensive Review of Self-Regulation Interventions from Birth through Young Adulthood*) that self-regulation interventions can have a positive impact on learning and academic outcomes in addition to benefits seen on social-emotional and behavioral competencies that are critical for academic readiness.  Although the effect sizes for these outcomes tend to be small, even very small academic effects can translate into measurable and meaningful change over time (Hill, Bloom, Black, & Lipsey, 2008).  Moreover, interventions studied to date tend to be brief.  With a cohesive, ongoing program that builds skills cumulatively across grade-levels, effects are likely to be strengthened.

- Specific self-regulation curricula may be challenging to schedule into the school-day, particularly beyond preschool and early elementary school, raising concerns about fidelity of implementation.  However, there may be ways that some curricular elements could be integrated into existing classes such as health education, which share goals to enhance student wellbeing. These classes may already be addressing topics such as conflict resolution, stress management, and mental health, just not from a specific self-regulation framework.

- Many schools have also embraced programs such as Positive Behavior Intervention Supports (PBIS), a multi-tiered system that emphasizes teaching positive behaviors to all students and providing targeted interventions and special education services to those students who do not respond.  Self-regulation intervention approaches and frameworks including co-regulation could be integrated into each of these levels, building upon infrastructure that may already be in place.

- Zero-tolerance policies that suspend students for impulsive or aggressive behaviors that may result from poor self-regulation have become increasingly common in many schools.  This is not consistent with a model that supports the development of self-regulation skills and builds relationships with school staff.  Zero-tolerance policies also risk creating additional trauma experiences for the most vulnerable students, either through the process of suspension itself or through secondary consequences such as retention.  More positive discipline approaches consistent with self-regulation intervention exist, including the Supportive School Discipline Initiative through the Office of Juvenile Justice and Delinquency Prevention (OJJDP) in the U.S. Department of Justice.

- With limited time and funding for professional development for teachers and other school staff, adding trainings around self-regulation may be challenging.  By emphasizing how self-regulation can provide a framework for a number of initiatives aimed at enhancing student wellbeing, there may be opportunities to incorporate specific self-regulation training components into existing professional development programs.  Similarly, existing behavior coaches or consultants could utilize a "co-regulation" model in helping teachers build relationships with challenging students as well as build self-regulation skills in students throughout their day to day interactions. Finally, teacher preparation programs could include this type of training in their curricula.

- Strengthening self-regulation development for all students through school-wide approaches also helps those who live in adversity or have experienced trauma.  One model for doing this has been developed by the Massachusetts Advocates for Children through the Trauma and Learning Policy Initiative (TLPI), which provides resources for creating and advocating for trauma-sensitive schools.  This model teaches school staff about the impact of trauma on learning, behavior, and relationships, reframing behavioral and emotional challenges using a trauma lens. This shift in understanding supports staff's adoption of a co-regulation role. Though this model has not yet been rigorously evaluated, it has been successfully implemented in many schools, demonstrating the feasibility of holistic, whole-school approaches.

## Self-Regulation Interventions in Early Childhood Programs (Birth through Age 2)

In considering self-regulation interventions for children during the first three years of life, it is first helpful to reflect on the key characteristics of normative development at this age when self-regulation demands are manageable and developmentally typical.  As described in Box 5a below, early building blocks of self-regulation emerge during infancy with simple attentional skills and brief delay of gratification developing during toddlerhood.  Behavior regulation at this age is limited because emotions are stronger than cognitive regulation.  However, in situations where adversity or stressors are prolonged or severe, self-regulation development may lag.  To support self-regulation development, co-regulation through the activities listed in the table is needed.  Such supports can be provided by caregivers (i.e., parents, teachers, mentors, or program staff) through interacting with young children either at home or in a care setting such as Early Head Start.  These strategies are also relevant for teens or young adults who are also parents and simultaneously experiencing adversity themselves (e.g., foster care or homelessness).

| Box 5a.  Self-Regulation Development and Co-Regulation from Birth through Age 2 | | |
|---|---|---|
| **Developmental Stage** | **Characteristics of Self-Regulation** | **How Caregivers Can Provide Co-Regulation** |
| Infancy (birth to ~age 1) | • Orient attention away from stressors <br> • Engage caregivers as resources for comfort <br> • Begin to self-soothe | • Interact in warm and responsive ways <br> • Anticipate and respond quickly to child's needs <br> • Provide physical and emotional comfort when child is stressed <br> • Modify environment to decrease demands and stress |
| Toddlerhood (~1-2 years) | • Begin to select and shift attention (attentional control) <br> • Adjust behavior to achieve simple goals <br> • Delay gratification and inhibit responses for short periods when there is structure and support <br> • Emotions are stronger than cognitive regulation <br> • Feelings of attachment support prosocial goals | • Reassure and calm child when upset by removing child from situations or speaking calmly and giving affection <br> • Model self-calming strategies <br> • Teach rules and redirecting to regulate behavior |

It is also useful to briefly review some of the specific data for self-regulation intervention studies and outcome results for this developmental group (see Box 5b), the details of which can be found in Report 3 at http://www.acf.hhs.gov/programs/opre/resource/self-regulation-and-toxic-stress-report-3.   In this developmental group, **most interventions were attachment-based and many were home-visiting programs.  Specific interventions include the ABC program, Bucharest Early Intervention, Family Foundations, Child First, and PALS**.  Specific intervention studies reviewed and their outcomes across domains can be found in Tables C1 and C2 in Report 3, Appendix C.

Based upon these data, a strong theoretical model, and knowledge of early childhood development programs supported by ACF, the following considerations are offered for program administrators and practitioners to strengthen self-regulation development in children age 0-2 years. Some of these also apply to children aged 3-5 and will be repeated in that section.

**Deliver promising self-regulation interventions (with medium to large effects across domains) to at-risk parents.**  Given variability in outcomes, programs should be selected carefully to achieve desired outcomes.  One delivery approach would be for Early Head Start (EHS) programs to contract with mental health consultants to provide services through the home-visiting component of EHS or through adaptation of biweekly socialization activities into group parenting meetings.

**Obtain training for staff in using co-regulation skills in interacting with children in center-based programs or in home visiting programs.**   The key components of co-regulation for those working with infants and toddlers include:
- Interacting in warm, responsive ways
- Anticipating and responding quickly to children's needs
- Providing physical and emotional comfort when child is stressed
- Modifying the environment to decrease demands and stress
- Reassuring and calming the child when upset by  removing child from situations or speaking calmly and giving affection
- Modeling self-calming strategies
- Teaching rules and redirecting to regulate behavior

**Identify ways to support staff's own self-regulation capacity, so they can better provide co-regulation support to young children and "buffer" them from stress and adversity in the environment.** This will be particularly important for low-wage earners and staff who have experienced trauma in their own lives. Staff supports may include mindfulness instruction and practice, reflective supervision, and public acknowledgement of use of co-regulation strategies.

### Conclusions on Interventions for Children from Birth-Age 2

Early interventions with parents and caregivers (i.e., parents, teachers, mentors, and program staff) of young children from high risk backgrounds are clearly effective in building caregiver co-regulation, which is foundational for supporting children's self-regulation development. It is particularly noteworthy that parenting behaviors change in meaningful and measurable ways given that the samples studied include many young children at risk for maltreatment and exposed to domestic violence. Young children also benefit in important ways from these parenting interventions, with greater results expected to accumulate over time. More intentional and systematic use of a self-regulation framework in trainings for early childhood program staff and existing interventions may enhance children's long-term developmental outcomes.

### Acknowledgments

## Self-Regulation Interventions in Early Childhood Programs (3-5 years)

In considering self-regulation interventions for children during the preschool years, it is first helpful to reflect on the key characteristics of normative development at this age when self-regulation demands are manageable and developmentally typical.  As described in Box 6a below, several cognitive regulation skills are developing rapidly along with language skills which support impulse control and rule following. Skills in managing emotions increase and allow young children to calm themselves and tolerate some frustrations and distress. However, in situations where adversity or stressors are prolonged or severe, self-regulation development may lag.  To support self-regulation development, co-regulation through the activities listed in the table is needed.  Such supports can be provided by caregivers (i.e., parents, teachers, mentors, or program staff) through interacting with young children either at home or in child care settings such as Head Start.

| Box 6a.  Self-Regulation Development and Co-Regulation for Ages 3-5 | |
| --- | --- |
| **Characteristics of Self-Regulation** | **How Caregivers Can Provide Co-Regulation** |
| <ul><li>Focused attention increases but is still brief</li><li>Begin to use rules, strategies and planning to guide behavior appropriate to situation</li><li>Delay gratification and inhibit responses for longer periods</li><li>Perspective-taking and empathy support prosocial goals</li><li>Language begins to control emotional responses and actions</li><li>Tolerate some frustration and distress apart from caregiver (self-calming skills emerge)</li></ul> | <ul><li>Model, prompt, and reinforce (or "coach") self-calming strategies when child is upset</li><li>Instruct and coach use of words to express emotion and identify solutions to simple problems</li><li>Coach rule-following and task completion</li><li>Provide external consequences to support emerging self-regulation skills</li></ul> |

It is also useful to briefly review some of the specific data for self-regulation intervention studies and outcome results for this age group (see Box 7b), the details of which can be found in Report 3 at http://www.acf.hhs.gov/programs/opre/resource/self-regulation-and-toxic-stress-report-3. Interventions in this developmental group include **several well-established social-emotional programs like PATHS, Incredible Years, ParentCorps, Head Start REDI, Tools of the Mind, and the Chicago Schools Readiness Project (CSRP).**  Specific intervention studies reviewed and their outcomes across domains can be found in Tables C3-C5 in Report 3, Appendix C.

**Box 6b. Relevant Report 3 Intervention Data for Ages 3-5**

- Study and Intervention Characteristics:  Large number of studies (*n* = 75), majority delivered universally
- Half of the samples live in adversity or are at-risk, suggesting strong application to those served by ACF programs
- 59% of participants were from a minority background (34% African-American and 25% Hispanic)
- Almost half were implemented across a full year of preschool (30 = modal # sessions)
- Almost 60% were implemented in childcare/preschool; 20% were implemented in homes
- Almost 80% of studies directly targeted children with the intervention; 57% targeted parents and 23% targeted teachers

Results Show:
- Consistent medium positive effects on parent co-regulation, skills, attitudes, & support as well as on classroom climate (when targeted)
- Small to medium effects on cognitive, emotional, and behavioral self-regulation, although this reflects considerable variability across programs, with some having no effects and others having large effects
- About half the interventions have a positive effect on stress and functional outcomes like learning, social competence, and mental health
- Comparable child outcomes are seen for different intervention approaches, including co-regulation only, child skills only, and the combination of co-regulation and child skills

Based upon these data, a strong theoretical model, and knowledge of early childhood programs supported by ACF including Head Start (HS), the following considerations are offered for program administrators and practitioners to strengthen self-regulation development in this developmental group.

**Deliver well-evaluated child skills curricula that have been shown to enhance self-regulation.**  In this age group in particular, there are several well-established programs that have been evaluated in large-scale studies and have guidelines and supports for effective implementation.  Program selection may be guided by particular outcomes of interest.  Inclusion of self-regulation interventions in early learning programs can be justified by results that show positive effects on language and learning as well as many other "approaches to learning" that are necessary for kindergarten readiness.  Implementation of such curricula by early childhood education teachers can be supported by TA providers or mental health consultants.

**Obtain training for staff in using co-regulation skills in interacting with children in center-based early care and pre-k programs such as Head Start**.  The key components of co-regulation training for those working with preschool-aged children include:
- Building warm, responsive relationships with children
- Intentional modeling, monitoring, and "coaching" of specific, targeted self-regulation skills such as identifying and expressing emotion, calming down and waiting

- Providing external regulation of emotions by anticipating and responding to children's needs and reassuring and comforting them when upset
- Providing external regulation of behavior by teaching rules, setting limits and redirecting

**Encourage preschool teachers to provide "self-regulation coaching" to young children.** This includes:

1) Prompting use of self-regulation skills in specific situations (e.g., taking deep breaths when upset)
2) Anticipating self-regulation demands (e.g., during transitions or less structured activities) and reviewing rules and strategies proactively
3) Role-playing such strategies to support the child's effective implementation of skills in the moment/situation
4) Monitoring the child while they are using these skills and providing specific positive feedback on small steps and efforts
5) Praising and reinforcing the child for success and teaching the child to self-praise, and
6) Helping the child consider alternative solutions to problems when efforts are not successful.

**Identify ways to support staff's own self-regulation capacity, so they can better provide co-regulation support to young children and "buffer" them from stress and adversity in the environment.** This will be particularly important for low-wage earners and staff who have experienced trauma in their own lives. Staff supports may include mindfulness instruction and practice, reflective supervision, and public acknowledgement of use of co-regulation strategies.

## Conclusions on Interventions for Preschool-Aged Children

Broad, substantive changes in self-regulation can be obtained with comprehensive interventions during the preschool years, with programs that typically last for several months. A variety of intervention approaches appear effective, including those that focus on direct skills instruction with children and those that focus on caregiver co-regulation. The critical component is that interventions be focused and intentional in targeting self-regulation development, with strategies that involve both parents and teachers such as self-regulation coaching. Teachers in particular are often overlooked for their role in creating a positive classroom climate and providing co-regulation.

## Acknowledgments

## Self-Regulation Interventions in Elementary School (Ages 5-10 years)

In considering self-regulation interventions for elementary-aged children, it is first helpful to reflect on the key characteristics of normative development at this age when self-regulation demands are manageable and developmentally typical.   As described in Box 7a below, children at this age have increased cognitive abilities that support behavior regulation, problem-solving in more complex social situations, and organizing their behavior to achieve goals.  They are learning to manage their emotions "in the moment" and may be motivated by empathy and concern for others.  However, in situations where adversity or stressors are prolonged or severe, self-regulation development may lag.  To support self-regulation development, co-regulation through the activities listed in the table is needed.  Such supports can be provided by parents, teachers, mentors, or other program staff.

**Box 7a.  Self-Regulation Development and Co-Regulation for Ages 5-10**

| Characteristics of Self-Regulation | How Caregivers Can Provide Co-Regulation |
|---|---|
| • Use of cognitive strategies and internal speech to control behavior<br>• Increased cognitive flexibility, attentional control, and more accurate appraisal of situations<br>• Emerging ability to manage emotion "in the moment"<br>• Empathy and concern for others may motivate behavior<br>• Social problem-solving emerges<br>• Increased ability to organize behavior in complex ways to achieve goals | • Teach problem-solving<br>• Model conflict resolution strategies<br>• Provide time, space, and support to manage emotions<br>• Model, prompt, and reinforce ("coach") organization and time management skills<br>• Monitor task completion while encouraging independence and providing external consequences as needed |

It is also useful to briefly review some of the specific data for self-regulation intervention studies and outcome results for this developmental group (see Box 7b), the details of which can be found in Report 3 (http://www.acf.hhs.gov/programs/opre/resource/self-regulation-and-toxic-stress-report-3). Interventions in this age group include **Fast Track, Strengthening Families, Making Choices, I Can Problem-Solve, Strong Start, Second Step, mindfulness, yoga, and computerized attention training.** Mindfulness is an increasingly mainstream technique of intentionally focusing attention on one's emotions and thoughts in the present moment, and accepting these thoughts and feelings without judgment.  Specific intervention studies reviewed and their outcomes across domains can be found in Table C6-C8 in Report 3, Appendix C.

**Box 7b. Relevant Report 3 Intervention Data for Elementary School**

Study and Intervention Characteristics
- Large number of studies (*n* = 134), the majority of which are universal
- Half of the samples live in adversity or are at-risk, suggesting strong application to those served by ACF programs
- 47% of participants were from a minority background (30% African-American and 17% Hispanic)
- About 3/4ths of interventions were implemented in schools
- Few interventions include co-regulation (1/3rd targeted parents; 10% targeted teachers); only 1/4 combined skills instruction and co-regulation approaches
- Half the interventions were implemented by teachers; the others by clinicians or other trained staff
- Intervention length varied widely, with about a third being 6-12 sessions long, a third 13-29 sessions, and a third more than 30 sessions in duration

Results show:
- Parenting outcomes are more variable at this age compared to early childhood (only 50% show positive results)
- When teachers are taught positive behavior management skills and ways to build relationships with students, classroom climate improves measurably
- There is broad positive impact overall across a number of core and functional domains including cognitive, emotional, and behavioral self-regulation; stress, delinquent behavior, interpersonal relationships, and mental health
- Tremendous variability is seen in effects across different interventions, suggesting caution in selecting any specific intervention program

Key strategies and considerations for strengthening self-regulation in this developmental group are primarily related to the school setting and are similar to those for middle school youth, so are presented in the next section.

## Self-Regulation Interventions in Middle School (Ages 11-14 years)

In considering self-regulation interventions for middle-school aged youth, it is first helpful to reflect on the key characteristics of normative development at this age when self-regulation demands are manageable and developmentally typical. As described in Box 8a below, early adolescent youth experience strong reward-seeking and emotional arousal which impacts decision-making, although they also become more focused and increasingly capable of organizing behavior and managing time independently. In situations where adversity or stressors are prolonged or severe, this normative self-regulation development may lag. To support self-regulation growth, co-regulation through the activities listed in the table is needed. Such supports can be provided by parents, teachers, or other adult mentors.

| Box 8a. Self-Regulation Development and Co-Regulation for Early Adolescence (Ages 11-14) | |
|---|---|
| **Characteristics of Self-Regulation** | **How Caregivers Can Support Co-Regulation** |
| • Increased focus and task completion<br>• More goal-oriented behavior and self-monitoring<br>• More complex behaviors and more independent time management<br>• Use of strategies to manage distress<br>• Emotional arousal stronger than cognitive controls<br>• Strong reward-seeking with relatively low fear<br>• Poor decisions made "in the moment" | • Monitor and reinforce task completion as needed given the youth's abilities and need for independence<br>• Continue to coach organizational skills<br>• Teach planning and prioritization<br>• Collaboratively problem-solve social and academic issues<br>• Coach healthy stress management<br>• Encourage decision-making when less emotional<br>• Review future goals<br>• Set limits to reduce risks related to increased reward-seeking<br>• Reduce the emotional intensity of interactions and situations exceeding coping skills |

It is also useful to briefly review some of the specific data for self-regulation intervention studies and outcome results for this developmental group (see Box 8b), the details of which can be found in Report 3 (http://www.acf.hhs.gov/programs/opre/resource/self-regulation-and-toxic-stress-report-3). Interventions evaluated in this developmental group include a wide range of programs including: **Coping Power, Multisite Violence Prevention, SEAL (Going for GOAL), Family Check-Up and others described as coping, life skills, problem-solving, conflict-resolution and youth development, as well as some mindfulness programs and a few self-regulated learning interventions**. Mindfulness is an increasingly mainstream technique of intentionally focusing attention on one's emotions and thoughts in the present moment, and accepting these thoughts and feelings without judgment. Specific intervention studies reviewed and their outcomes across domains can be found in Tables C9-C11 in Report 3, Appendix C.

**Box 8b. Relevant Report 3 Intervention Data for Middle School Youth**

Study and Intervention Characteristics
- Large number of studies (*n* = 78), the majority of which are universal (73%)
- Slightly less than half (40%) target youth living in adversity or those who are at-risk, primarily through work in high poverty schools
- 53% of participants were from a minority background (35% African-American and 18% Hispanic)
- Almost 80% of interventions were implemented in schools
- The most typical length of interventions was 6-12 sessions, representing about 50% of studies
- Few target parents (20%) or teachers (<10%) with co-regulation interventions, although caregiver involvement was more likely for youth targeted due to living in foster care or with substance using or divorced parents
- Very few (14%) include skills instruction AND co-regulation approaches

Results show:
- Positive effects on parenting skills and parents' mental health when targeted
- Primarily small overall effects on child self-regulation and functional domains, although this reflects considerable variability across different programs with many finding no significant effects
- Most promising benefits are seen for cognitive and behavioral regulation and delinquent behavior; this is consistent with the targeted goals of typical middle school interventions
- Limited impact on emotion regulation, despite the developmental need at this age; this may be due to lack of intervention focus on this domain

Based upon these data, a strong theoretical model, and knowledge of programs supported by ACF for **elementary and middle-school aged children** such as relationship education, teen pregnancy prevention, and afterschool care for school-age children, the following key strategies are identified for consideration by  school and program administrators and practitioners to strengthen self-regulation development in this developmental group.

### School and Afterschool Programs

**Encourage a positive school climate during the school day and in afterschool programs to support self-regulation development for all students**.  This is characterized by warm, responsive teachers and staff and a positive discipline system that emphasizes instruction of skills over harsh, zero-tolerance consequences.  According to the National School Climate Standards (http://www.schoolclimate.org/climate/standards.php), such a climate includes norms, values, and expectations that support students feeling socially, emotionally and physically safe; fosters respect and collaboration across students, families, and educators; and nurtures equal opportunity for all students to succeed.  Whole-school approaches that shift peer norms may be particularly useful for early adolescents whose peer relationships are increasingly influential in their decision-making and risk behaviors.

**Incorporate language and practices from school-wide positive behavior supports (PBS) into afterschool programming.**  Consistency could be enhanced by having afterschool administrators

participate in PBS teams, sharing data on behavior incidents that occur during afterschool with school administrators, and coordinating individual behavior intervention plans for students who are experiencing challenges being successful during the school day.  This consistency will enhance students' ability to learn self-regulation skills and regulate themselves in different situations.

**Deliver self-regulation skills training in at-risk schools during afterschool programs.**  Specific curricula for targeted populations could be provided during small groups of similarly-aged students a few times per week as a special activity.  This setting may also facilitate parent involvement in co-regulation training or at least sharing information about skills being addressed, with suggestions for home reinforcement.  Programs are encouraged to select curricula carefully using Report 3's Appendix C of intervention findings given the variability in outcomes seen for different types of curricula.  Programs that more intentionally address cognitive, emotional, and behavioral domains of self-regulation would be preferable.  For middle schoolers in particular, emotion regulation skills should be targeted given the developmental imbalance of cognitive controls with reward-seeking and emotional arousal systems in the brain.

**Obtain training for teachers and afterschool staff in how to teach, model, reinforce, and coach self-regulation skills throughout the school day**.  Such co-regulation training could be provided during existing professional development opportunities under the broader umbrella of healthy living skills or positive youth development.  Teacher training in this area is an intervention approach that is under-utilized for school-aged children, but appears to have great potential given that teachers are commonly delivering curricula to students.  The key components of co-regulation training at this age are:
- Building warm, responsive relationships
- Teaching intentional modeling, monitoring, and "coaching" of specific, targeted self-regulation skills such as organizing and planning for school success, collaborative problem-solving to achieve goals and resolve conflicts, making decisions when less emotional, managing frustration and distress, and seeking help when needed in dangerous or stressful situations
- Providing external regulation of emotions by reducing the emotional intensity of conflict situations and interactions
- Providing external regulation of behavior by regularly reviewing rules and using positive discipline strategies including setting limits to reduce risks for early adolescents

**Identify ways to support school and program staff's own self-regulation capacity, so they can better provide co-regulation support to children and youth and "buffer" them from stress and adversity in the environment.**  This will be particularly important for low-wage earners and staff who have experienced trauma in their own lives.  Staff supports may include mindfulness instruction and practice, reflective supervision, and public acknowledgement of use of co-regulation strategies.

**Encourage afterschool staff and other student support staff to "coach" self-regulation during recreational and other less structured activities**.  Self-regulation coaching for elementary and middle school children involves:

- Prompting use of self-regulation skills in specific situations (e.g., taking deep breaths or pausing when upset)
- Anticipating self-regulation demands (e.g., during less structured activities or interactions with unfriendly peers) and developing plans to solve anticipated problems
- Role-playing such strategies to support the child's effective implementation of skills in the moment/situation
- Monitoring the child while they are using these skills and providing specific positive feedback on small steps and efforts, or having older children share self-reflections of their implementation soon afterwards
- Praising and reinforcing the child for success and teaching the child to self-praise efforts
- Helping the child consider alternative solutions to problems when efforts are not successful

When at-risk youth such as those in foster care or who are homeless are targeted, training may need to be more specialized (as described later in this report). In particular, school staff would also be taught to attend to the early signs that a youth may be experiencing an emotional crisis in order to avoid what can be a very rapid escalation or "dysregulation". Staff can also be taught to pay attention to their own feelings and do what is necessary to ensure they are able to respond effectively.

## Conclusions on Interventions for Children in Elementary and Middle School

Although data suggest that relatively few self-regulation interventions have targeted teachers and school staff, enhancing the school climate and adopting positive discipline approaches are potentially powerful universal supports for self-regulation development in elementary and middle school aged children. This also decreases environmental stress for youth with adverse childhood experiences that place them at risk for self-regulation difficulties. Afterschool programs provide a unique opportunity to target more at-risk schools and students with self-regulation skill development curricula. Although parenting interventions at this age appear somewhat less effective than for younger children, this may be related to the lack of a clear intervention approach for building self-regulation at this age.

### Acknowledgments

## Self-Regulation Interventions in High School (Ages 14-18 years)

In considering self-regulation interventions for high-school aged youth, it is first helpful to reflect on the key characteristics of normative development at this age when self-regulation demands are manageable and developmentally typical.   As described in Box 9a below, adolescent youth have increased focus and organization and are developing future perspective.  They become better able to manage their emotions during this period, although continue to need guidance and support particularly with new tasks and when they are under stress.  For youth where adversity or stressors are prolonged or severe, this normative self-regulation development may lag.  To support continued self-regulation growth during this important developmental period, co-regulation through the activities listed in the table is needed.  Such supports can be provided by parents, teachers, or other adult mentors.

**Box 9a.  Self-Regulation Development and Co-Regulation for High School (Ages 14-18)**

| Characteristics of Self-Regulation | How Caregivers Can Support Co-Regulation |
|---|---|
| • Focus and persist on complex and challenging tasks<br>• More complex and independent planning, time management, and prioritization<br>• Future orientation may influence behavior<br>• Consideration of others' perspectives in goal-setting<br>• Making less emotional decisions<br>• Managing distress more effectively with support | • Monitor achievement of goals<br>• Provide problem-solving support as needed<br>• Prompt and reinforce effective time management and goal completion<br>• Help anticipate difficult decisions before they arise<br>• Encourage future perspective<br>• Prompt and support healthy stress management<br>• Reduce risks that may exceed coping skills or provide "safe" risks |

It is also useful to briefly review some of the specific data for self-regulation intervention studies and outcome results for this developmental group (see Box 9b), the details of which can be found in Report 3 (http://www.acf.hhs.gov/programs/opre/resource/self-regulation-and-toxic-stress-report-3). Interventions evaluated in this developmental group include a **wide range of programs including life skills, leadership, problem-solving, conflict-resolution, mindfulness, and several mind-body interventions** such as yoga and meditation.  Mindfulness is an increasingly mainstream technique of intentionally focusing attention on one's emotions and thoughts in the present moment, and accepting these thoughts and feelings without judgment.  Specific intervention studies reviewed and their outcomes across domains can be found in Tables C12-14 in Report 3, Appendix C.

**Box 9b. Relevant Report 3 Intervention Data for High School Youth**

Study and Intervention Characteristics
- Few studies (*n* = 36) were identified for this age group, the majority (72%) of which were universal
- 39% included samples living "in adversity" or considered "at-risk"; most of these were for students with risk characteristics
- About 60% of participants were from a minority background (45% African-American and 14% Hispanic)
- Over 80% of interventions were implemented in schools
- Only 1 study used a co-regulation approach and none targeted teachers; over 90% used direct skill instruction alone; only about 5% combined these approaches.
- More than half of the interventions were 12 sessions or less
- Almost 40% of the interventions were implemented by teachers; most of the others were delivered by clinicians, university staff, or other trained staff

Results show:
- Moderate and reasonably consistent effects on cognitive self-regulation
- Small effects on youth mental health (although outcomes vary considerably across studies) and delinquency; this latter small effect may translate to meaningful improvements for higher-risk youth
- Minimal overall effects on a variety of other self-regulation and functional domains assessed
- Some programs are considerably more effective than others, which may reflect differences in intervention approaches.

Based upon these data, a strong theoretical model, and knowledge of programs supported by ACF for high-school aged children such as relationship education and teen pregnancy prevention, the following key strategies are identified for school and program administrators and practitioners to consider for strengthening self-regulation development in this developmental group.

**Encourage a positive high school climate to support self-regulation development for all students.** This is characterized by warm, responsive teachers and staff and a positive discipline system (like Positive Behavior Interventions and Support) that emphasizes instruction of skills over harsh, zero-tolerance consequences. According to the National School Climate Standards (http://www.schoolclimate.org/climate/standards.php), such a climate includes norms, values, and expectations that support students feeling socially, emotionally and physically safe; fosters respect and collaboration across students, families, and educators; and nurtures equal opportunity for all students to succeed. Whole-school approaches that shift peer norms and reduce bullying may be particularly useful for adolescents whose peer relationships are influential in their decision-making and risk behaviors.

**Provide specific targeted self-regulation curricula in health education classes** that will support more advanced self-regulation skills necessary for successfully transitioning to post-secondary education, self-sufficiency, and satisfying careers. Many programs supported by Healthy Marriage Responsible Fatherhood (HMRF) grants and the Personal Responsibility Education Program are already implementing school-based curricula that address life skills and relationships. However, intentional self-regulation skills instruction may not be included. Given the limitations of existing curricula for this age group,

comprehensive and effective approaches may involve adopting components of different interventions that impact different domains or adapting more comprehensive curricula reviewed in Report 3's Appendix for younger age groups.  Areas to address with such a curricula include:  goal setting, planning, monitoring, and self-reinforcement, planning ahead for challenging decisions, problem solving in stressful situations, decision-making with greater future perspective and compassion for self and others, awareness of and attention to emotions, managing distress more independently, and seeking help when needed in dangerous or stressful situations. Special attention should be given to emotional regulation, perhaps with promising mind-body strategies that have been effectively delivered in a number of high schools.

**Enhance programs focused on "soft skills", life skills, mentoring or leadership with more intentional and targeted self-regulation skill-building.**  Unfortunately, a supportive mentoring relationship is necessary but not sufficient to enhance self-regulation.  Self-regulation skills should ideally be taught systematically according to a theoretical model with ongoing scaffolding and support.  There should also be a specific focus on emotion regulation, which is particularly important given the nature of development and social relationships in adolescence, and on the integration of emotion regulation with cognitive regulation.  See the previous recommendation for specific suggestions on content.

**Obtain training for teachers and other school staff responsible for delivering self-regulation curricula** so they can effectively teach, model, reinforce, and coach use of these skills throughout the school day.  Such training could be provided during existing professional development opportunities under the broader umbrella of healthy living skills.  When in-risk youth such as those in foster care or who are homeless are targeted, training may need to be more specialized (as described later in this report).  Teacher training is an intervention approach that has seldom been adopted for this age group, but appears to have great potential given that teachers are commonly delivering curricula to students.  The key components of co-regulation training are described in the recommendation for self-regulation coaches.

**Identify ways to support school and program staff's own self-regulation capacity, so they can better provide co-regulation support to children and youth and "buffer" them from stress and adversity in the environment.**  This will be particularly important for low-wage earners and staff who have experienced trauma in their own lives.  Staff supports may include mindfulness instruction and practice, reflective supervision, and public acknowledgement of use of co-regulation strategies.

**Provide self-regulation "coaching" for adolescents within schools and other programs.**  Self-regulation coaching at this age involves strategies such as:
- Monitoring achievement of short and long-term goals
- Providing collaborative problem-solving support
- Prompting and reinforcing effective time management and goal completion
- Helping anticipate difficult decisions before they arise
- Encouraging adolescents to gain perspective on their future
- Prompting and supporting healthy stress management

**Obtain training for self-regulation coaches, including mentors, in the co-regulation process and strategies.**  For program and high school staff, this training would ideally include the following:

- Building warm, responsive relationships in which adolescents can feel safe to learn and make mistakes as they increasingly navigate bigger decisions and more complex situations on their own
- Prompting use of self-regulation in specific situations
- Anticipating self-regulation demands (e.g., difficult decisions in risk situations, end of semester workload) and collaboratively planning strategies to address
- Rehearsing such strategies as needed to support the youth's effective implementation of skills in the moment/situation
- Monitoring the youth while they are using these skills or having the youth share self-reflections of their implementation soon afterwards
- Encouraging the youth to self-praise efforts if successful, and if not, to problem-solve their strategies or revise their goals
- Connecting youth's efforts and progress to their long-term goals and encouraging a future perspective.
- Providing external regulation of emotions by reducing the emotional intensity of conflict situations
- Providing external regulation of behavior by limiting opportunities for risk-taking behaviors, providing positive discipline, and natural consequences for poor decisions.

## Conclusions on Interventions for High School-Aged Youth

The types of programs being used to target self-regulation for this age group are diffuse, ranging from life skills, leadership, problem-solving, and conflict-resolution to mind-body interventions. Not surprisingly, existing self-regulation interventions for this age group have found weaker social-emotional outcomes than for younger children, which may be due to the broader, more diffuse approach to interventions, the lack of attention to emotion regulation, or the lack of involvement of caregivers (i.e., parents, teachers, mentors, or program staff) in providing co-regulation support. Thus, further work on intervention development is needed to more intentionally focus on self-regulation skills, particularly emotion regulation, and to include parents, teachers, and mentors as self-regulation coaches. More rigorous evaluation of outcomes is also needed. Strategies and considerations are guided by a strong theoretical model that supports co-regulation and coaching together with an intentional skill-building approach.

## Acknowledgments

## Self-Regulation Interventions for Young Adults (Ages 18-25 years)

In considering self-regulation interventions for young adults, it is first helpful to reflect on the key characteristics of normative development at this age when self-regulation demands are manageable and developmentally typical.   As described in Box 10a below, young adults are further developing an array of cognitive and emotional self-regulation skills that support good decision-making and goal achievement with increased abilities to solve complex problems and manage stress.   However, for youth where adversity or stressors are prolonged or severe, this normative self-regulation development may lag.  To optimize self-regulation growth during this developmental period, co-regulation through the activities listed in the table is needed.

| Box 10a.  Self-Regulation Development and Co-Regulation for High School (Ages 18-25) | |
| --- | --- |
| **Characteristics of Self-Regulation** | **How Caregivers Can Support Co-Regulation** |
| • Persist on long-term projects<br>• Manage time independently<br>• Self-monitor, self-reinforce, and overcome challenges to goals<br>• Delay gratification to achieve goals<br>• Future orientation begins to guide behavior<br>• Make decisions with broader perspective and compassion for self and others<br>• Organize complex behaviors in context and independently<br>• Manage frustration and distress independently<br>• Maintain emotional balance in response to normative stressors | • Provide consultation on important decisions<br>• Provide guidance for complex problem-solving<br>• Provide support in coping with significant stressors and negotiating more complex life situations |

It is also useful to briefly review some of the specific data for self-regulation intervention studies and outcome results for this age group (see Box 10b), the details of which can be found in Report 3 (http://www.acf.hhs.gov/programs/opre/resource/self-regulation-and-toxic-stress-report-3). Interventions evaluated in this age group include **a relatively large number of mind-body interventions and mindfulness; they also focused on stress management and resilience, cognitive modification, and life skills**.  Mind-body interventions include yoga and meditation.  Mindfulness is an increasingly mainstream technique of intentionally focusing attention on one's emotions and thoughts in the present moment, and accepting these thoughts and feelings without judgment.  Specific intervention studies reviewed and their outcomes across domains can be found in Table C15 in Report 3, Appendix C.

**Box 10b. Relevant Report 3 Intervention Data for Young Adults**

Study and Intervention Characteristics
- Relatively few studies (*n* = 23) were identified for this age group
- The large majority (87%) were universal interventions, many of which were implemented in college settings with undergraduate or graduate students
- 17% included samples considered "at-risk"; none included youth living "in adversity"
- 33% of participants were from a minority background (22% African-American and 11% Hispanic)
- Almost half the interventions were implemented in a research laboratory; about 1/4th were implemented in a more general college setting
- No studies used interventions with a co-regulation approach or involved the youth's parents as participants
- Over half the interventions were five sessions or less
- Interventions were implemented (in relatively equal numbers) by clinicians, university staff, other trained staff, or computers (22%)

Results show:
- Medium to large effects in a number of core self-regulation domains including emotion regulation, stress, and mindfulness
- Small to medium effects are seen on broader functional domains including learning, delinquency and mental health
- These encouraging effects must be interpreted within the context of the narrow sample characteristics and measures which appear to be highly aligned with interventions (especially for cognitive outcomes)

Based upon this information and knowledge of programs supported by ACF for young adults such as TANF employment programs, Healthy Marriage Responsible Fatherhood (HMRF) programs, the following key strategies and considerations are provided for program administrators and practitioners for strengthening self-regulation development in this developmental group.

### Youth Development and Employment

**Provide self-regulation interventions that support skills relevant to employment success and self-sufficiency.** Such skills include interpersonal skills, motivation/initiative, organization, prioritization, time management, stress management and positive mental health. Unfortunately, however, no studies identified in our review specifically examined job performance, employment outcomes, or financial wellbeing. Individual intervention components from the available studies could be selected for adoption based on review of outcome domains in Report 3's Appendix, with the goal of enhancing both cognitive and emotional regulation (and their integration) as well as relevant functional domains. Potentially promising areas include mindfulness and computer-administered programs. However, the existing self-regulation intervention literature for this developmental group is limited in its application to youth served by ACF programs and outcome effects may not extend to broader functioning.

**Include self-regulation skills as a non-core job skill in "soft skills" programs supported by TANF, including summer youth employment programs.** Self-regulation skills should ideally be taught systematically according to a theoretical model with ongoing scaffolding and support. There should also

be a specific focus on emotion regulation, which is still developing in young adults, and on the integration of emotion regulation with cognitive regulation. Indeed, failing to integrate these two components likely contributes to lack of follow through and poor decisions that lead to youths' employment and self-sufficiency failures.

**Provide self-regulation coaching to assist youth in finding, applying for, and keeping a job and becoming self-sufficient**. Such coaches could include job supervisors, faculty or support staff at higher education institutions, or other adult mentors such as those provided through TANF, the Career Pathways model in the Health Professions Opportunity Grant (HPOG) program, or other youth development programs. The focus of such job coaching would involve:

- Prompting use of planning skills for finding and applying for positions and use of problem-solving when conflicts with supervisors or coworkers arise
- Anticipating conflicts with coworkers or scheduling that requires time management and prioritization (e.g., having school assignments due when asked to do an extra shift) and collaboratively planning strategies to address
- Rehearsing such strategies as needed to support the youth's effective decision-making and follow through in the moment/situation
- Having the youth share self-reflections of their implementation of strategies soon afterwards,
- Encouraging the youth to self-praise efforts if successful, and if not, to problem-solve their strategies or revise their goals, and
- Connecting their efforts and progress to the youth's long-term career goals and encouraging a future perspective.

**Obtain training for youth development and employment program staff in co-regulation processes and strategies.** This includes building a positive agency climate and warm, responsive interactions with young adults. This will help build youths' self-regulation skills for self-sufficiency as well as healthy marriage and responsible parenthood. In particular, service access can be streamlined and made available to all target youth unless they opt out, thereby bypassing some of the self-regulation challenges often inherent in registering for services. Staff training can ensure that staff understand how self-regulation develops (like literacy), how stress and adversity can interfere with this, and how they can strengthen this for the young adults with whom they work. This will engender supportive attributions when youth repeat mistakes and make poor decisions. Staff can also be trained to provide self-regulation coaching as described above, which may be useful during teachable moments that arise during their work with youth even if their coaching roles are not formal or ongoing. For example, emotion regulation can be supported when staff validate youth's experiences during times of stress and defer problem-solving until they can focus calmly and take some perspective on their situation. Cognitive regulation can be supported with careful reframing, empowering positive self-talk in youth, and planning ahead for difficult decisions that are anticipated.

### Conclusions on Interventions for Young Adults

This review indicates that young adulthood is not too late to build self-regulation skills, and indeed, may be an ideal time to improve outcomes in some domains such as those related to employment success and self-sufficiency. It is particularly encouraging that emotion regulation improves at this age, in contrast to findings for younger adolescents, perhaps because of the inclusion of a large number of mindfulness-related interventions. The strong positive intervention effects seen in several domains are nonetheless qualified by narrow sample characteristics in most of the studies identified and lack of

assessment of job performance or financial wellbeing outcomes.  Key strategies for consideration  are guided by a strong theoretical model that supports co-regulation and coaching together with an intentional skill-building approach.

## Acknowledgments

## Self-Regulation Interventions for Children and Youth who are At-Risk or Living in Adversity

A number of ACF programs target children and youth who are at-risk or living in conditions of extreme adversity, including those who are homeless, at risk for or living in foster care, group homes, domestic violence shelters, and runaway/homeless shelters.  In considering implications of self-regulation interventions for these children and youth, it is important to note that relatively few intervention studies identified in our Report 3 review targeted these samples and setting specifically.  Of those that did, most sampled children/youth in foster care and a few sampled children whose families were being monitored by Child Protective Services.  Thus, implications are also drawn from our theoretical model of self-regulation development (described in Report 1) and from knowledge of how stress impacts self-regulation development (described in Report 2) as well as existing intervention data.

As detailed in Report 3, samples included in our outcome analyses were considered to be living "in adversity" if they were identified on the basis of environmental factors known to predict self-regulation difficulties (e.g., trauma, poverty).  *In-adversity due to poverty* was defined as samples having >70% free/reduced lunch rates, Head Start programs average household income < $20,000, or defined by study authors as "low income".  *In-adversity due to other factors* included children and youth in foster care , those with a depressed or substance-using parent, and those whose parents had divorced, among others.  Interventions for samples in adversity were either universally provided to all participants within the relevant setting (e.g., a low-income school), or were provided in a more targeted program format (e.g., in a program just for children of divorce).  Samples were considered *"at risk"* if they were identified based upon an individual health or well-being risk characteristic such as elevated rates of social-emotional (e.g., depressive thinking) or behavior difficulties or physical characteristics such as prematurity, low birth weight, or HIV status.  Interventions for such samples were typically provided in some type of targeted format (e.g., pull-out program in a school setting).

It is also useful to briefly review some of the specific data for self-regulation intervention studies and outcome results for this population (see Box 11), the details of which can be found in Report 3 (http://www.acf.hhs.gov/programs/opre/resource/self-regulation-and-toxic-stress-report-3).

**Box 11. Relevant Intervention Data for Children and Youth At-Risk or Living in Adversity**

- The percent of interventions addressing these populations decreases dramatically by age, from almost 80% for infants and toddlers to less than 20% for young adults
- Across elementary, middle, and high school, 20-30% of interventions target at-risk samples
- Relatively few interventions have been implemented in special settings serving these populations (e.g., shelters, foster care)
- Many interventions for youth living in adversity due to factors beyond poverty include co-regulation approaches, which is encouraging; however, relatively few focus on both skills instruction and co-regulation
- At younger ages, some improvements are seen in stress (including decreased salivary cortisol levels), but very few studies assessed stress during adolescence
- Living "in adversity" impacts outcomes for some age groups (in both positive and negative directions), but this is not a consistent effect.

Based upon this information and knowledge of programs supported by ACF for children and youth at-risk or living in adversity such as foster care and group care, runaway and homeless shelters, and domestic violence shelters, the following key strategies are identified for program administrators and practitioners to consider for strengthening self-regulation development in this developmental group.

### Foster Care and Group Care

**Provide a predictable, responsive, and supportive setting with warm and caring adults, ideally in a family environment.** For youth whose primary caregivers are not parents or other family members, special efforts are needed to build warm, responsive relationships with foster parents and other caregivers (including residential and group home staff), as well as other caring adults while simultaneously providing structure and limits within a positive discipline approach. This can be challenging for youth who have had adverse childhood experiences and may have delays in self-regulation including interpersonal difficulties as well as disruptive and risky behaviors. Moreover, such youth often experience high stakes consequences for impulsive behaviors (e.g., being kicked out of extended foster care) that could result in a loss of co-regulation supports and relationships that are important for the youth's self-regulation development.

**Build a trauma-sensitive, positive climate within group homes and foster care homes, with behavior management systems that support self-regulation development.** This involves creating norms, values, and expectations that support youth feeling socially, emotionally and physically safe and fosters respect and collaboration between youth and their caregivers. More specifically with regard to behavior management systems, greater emphasis should be placed on rewards than punishments. In addition, there should be a focus on teaching skills rather than simply providing external rewards and consequences.

**Educate foster parents and staff about the impact of trauma on self-regulation including stress reactivity, executive functioning, and emotion regulation.** In other words, teach them to identify children's individual "triggers" and tendency to distort or misperceive even innocuous adult behaviors. Adopting a trauma-sensitive "lens" may positively shape their attributions about and responses to

children and youth's behaviors.   It may also support foster parents and staff in better understanding how to approach different children given their unique triggers and methods of self-calming.

**Provide specific training to foster parents and other caregivers in self-regulation development and co-regulation**.  Evidence-based parenting programs evaluated for this caregiving population (e.g., Multi-dimensional Treatment Foster Care) that emphasize both relationship-building and positive discipline may be useful. Training should also address self-regulation development, the impact of stress on self-regulation and the importance of adopting a trauma-sensitive lens, and the need for environmental supports.  Components of co-regulation training may be provided as an enhancement to more general parenting programs, however, each of these specific training elements should be included:

1) Building warm, responsive relationships in which youth can feel safe to learn and make mistakes as they increasingly navigate bigger decisions and more complex situations on their own
2) Teaching intentional modeling, monitoring, and "coaching" of specific, targeted self-regulation skills
3) Providing external regulation of emotions by reducing the emotional intensity of conflict situations
4) Providing external regulation of behavior by limiting opportunities for risk-taking behaviors, providing positive discipline, and natural consequences for poor decisions

**Address staff's own self-regulation needs to enable them to provide co-regulation and serve as effective self-regulation coaches**.  Many staff working in care environments have their own traumatic histories, have heard stories of youth's traumatic histories, and may even be the target of violence (verbal and/or physical) at the hands of those they are trying to help.  It can thus be challenging for staff to provide co-regulation when they may be struggling with self-regulation themselves.  Thus, before staff are expected to provide co-regulation, these issues should be addressed, with continued support provided throughout their service.  Staff supports may include mindfulness instruction and practice, reflective supervision, and public acknowledgement of use of co-regulation strategies.

**Engage foster parents and other caregivers and advocates as self-regulation "coaches" for at-risk youth.**  Such coaching involves:

1) Prompting use of self-regulation skills in specific situations
2) Anticipating self-regulation demands (e.g., stressful situations) and collaboratively planning strategies to manage stress and address the situation
3) Rehearsing such strategies as needed to support the youth's effective implementation of skills in the moment/situation
4) Monitoring youth while they are using these skills or having the youth share self-reflections of their implementation soon afterwards
5) Encouraging the youth to self-praise efforts if successful, and if not, to problem-solve their strategies or revise their goals
6) Connecting their efforts and progress to the youth's long-term goals and sharing perspectives on their future.

For at-risk youth who often have trauma histories, it is also important for foster parents and other caregivers (including school staff) to attend to the early signs that a youth may be experiencing an emotional crisis in order to avoid what can be a very rapid escalation or "dysregulation".  Staff can be taught to pay attention to their own feelings to ensure they are able to respond effectively through programs such as the Mandt system, Therapeutic Crisis Intervention (TPI) or those offered by the Crisis Prevention Institute (CPI).

**Provide scaffolded opportunities for practicing self-regulation skills in developmentally appropriate situations** with "safe risks". As with all learning, self-regulation skill development is optimized when children and youth are asked to manage their behavior and complete tasks at the edge of, but not beyond, their abilities and frustration tolerance. Thus, in order to maintain optimal emotional arousal for learning, some demands may need to be modified, broken down, or specific supports from caregivers may need to be provided. In addition, older children and youth need opportunities to make decisions and solve problems in normative situations and activities such as having sleepovers and driving. These opportunities should be paired with the coaching described above.

**Provide targeted self-regulation skill-building interventions for youth evidencing difficulties**. Although youth with a history of adverse experiences are more likely to have trouble self-regulating when faced with changes and new stressors, there is evidence that interventions can reverse a negative developmental trajectory. Ideally, such skills instruction would build upon universal self-regulation supports provided through schools, using similar language and curricula for different ages. It would be provided in coordination with co-regulation training for caregivers (i.e., parents, teachers, mentors, or program staff), again with consistent language and targeting of skills. Indeed, any child or youth whose self-regulation difficulties are at the clinical level should be referred for such an evidence-based mental health treatment program with self-regulation components [e.g., Dialectical Behavior Therapy (DBT) or Trauma-focused Cognitive Behavior Therapy (TF-CBT)] and a focus on parent/caregiver skills and supports.

## Acknowledgments

During crisis situations, **the shelter itself can provide co-regulation support to parents and children** through a warm, supportive, and safe environment.  Shelter staff can support emotion regulation by listening to and validating the family's experiences.  Cognitive regulation for older children and adults can be supported by empowering positive self-talk and using therapeutic strategies from DBT and TF-CBT.  Older youth and adults can be encouraged to maintain a future orientation and identify meaningful small steps towards long-term goals.  All family members should be supported in continued help-seeking when stress is unmanageable or their environment is dangerous, using relevant family intervention approaches when possible.  In addition, parents and children should be connected to other programs that can continue to support self-regulation development, safety maintenance, and trauma processing once the family leaves the shelter.

**Educate shelter staff and parents about the impact of trauma on self-regulation** including stress reactivity, executive functioning, and emotion regulation.  In other words, teach them to identify children's individual "triggers" and tendency to distort or misperceive even innocuous adult behaviors.  Adopting a trauma-sensitive "lens" may positively shape their attributions about and responses to children and youth's behaviors.   It may also support parents and staff in better understanding how to approach different children given their unique triggers and methods of self-calming.

**Shelter staff can also teach parents to use co-regulation with their children during times of stress.**  This would involve:
1) Buffering children from external stressors by maintaining consistency and removing sources of stress when possible
2) Interacting in warm, responsive ways that will help youth feel safe and cared for despite stressors in the environment
3) Providing external regulation of emotions by reassuring and comforting children when upset and reducing the emotional intensity of conflict situations, and
4) Providing external regulation of behavior by providing limits and consistently using positive discipline.

It is also important for shelter staff and parents to attend to the early signs that a child or youth may be experiencing an emotional crisis in order to avoid what can be a very rapid escalation or "dysregulation".

**Provide specific training to shelter staff around self-regulation and co-regulation**.  Training should address self-regulation development, the impact of stress on self-regulation, and the importance of environmental supports.  Components of co-regulation training include:
1) Building warm, responsive relationships in which youth feel supported to learn from their experiences and mistakes
2) Teaching intentional modeling, monitoring, and "coaching" of specific, targeted self-regulation skills
3) Providing external regulation of emotions by reducing the emotional intensity of conflict situations
4) Providing external regulation of behavior by limiting opportunities for risk-taking behaviors, providing positive discipline, and natural consequences for poor decisions.

Such training would also support staff's own self-regulation when needed to enable them to provide co-regulation and serve as effective self-regulation coaches.

**Shelter and Transitional Living Program staff can provide co-regulation support to youth** through a warm, supportive, and safe environment, even if youth's stays are only very short-term.  Shelter staff can support emotion regulation by listening to and validating the youth's experiences.  Cognitive regulation can be supported by empowering positive self-talk and using therapeutic strategies such as those from Dialectical Behavior Therapy (DBT) or Trauma-focused Cognitive Behavior Therapy (TF-CBT).  Older youth can be encouraged to maintain a future orientation and identify meaningful small steps towards long-term goals.  They should be supported in continued help-seeking when stress is unmanageable or their environment is dangerous, using relevant family intervention approaches when possible.  In addition, youth should be connected to other programs that can continue to support self-regulation development within a stable living situation once the youth leaves the shelter.

**Introduce or review targeted self-regulation skill-training relevant to the current situation.**  Although youth with a history of adverse experiences are more likely to have trouble self-regulating under stress, shelters provide an opportunity to prevent a further negative cascade.  Ideally, such time-limited skills instruction/review would build upon universal self-regulation supports provided through schools, using similar language and curricula for different ages.  Specific universal programs can be identified in the Report 3 Appendix for different age groups. Additionally, some programs developed for clinical populations like Dialectical Behavior Therapy (DBT) or Trauma-focused Cognitive Behavior Therapy (TF-CBT) may also be relevant to consider.  Specific self-regulation skills relevant to youths' current situation include anticipating difficult decisions they may face in risk situations and planning ahead to address these when they are less emotional, and coping through mind-body or stress management strategies.
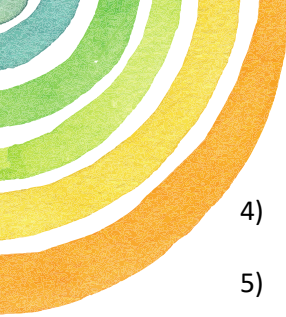
**Provide specific training to shelter and transition living center staff around self-regulation and co-regulation.**  Training should address self-regulation development, the impact of stress on self-regulation, and the importance of environmental supports.  In particular, shelter staff should consider that stress may be impairing youths' problem-solving and decision-making during this time.  Components of co-regulation training include:
1) Building warm, responsive relationships in which youth feel supported to learn from their experiences and mistakes
2) Teaching intentional modeling, monitoring, and "coaching" of specific, targeted self-regulation skills
3) Providing external regulation of emotions by reducing the emotional intensity of conflict situations
4) Providing external regulation of behavior by limiting opportunities for risk-taking behaviors, providing positive discipline, and natural consequences for poor decisions.

Such training would also support staff's own self-regulation when needed to enable them to provide co-regulation and serve as effective self-regulation coaches.

**Encourage shelter staff to provide self-regulation coaching in the moment as the need arises.**  Such coaching for youth with a history of adverse experiences involves:
1) Prompting use  of self-regulation skills in specific situations
2) Anticipating self-regulation demands (e.g., stressful situations) and collaboratively planning strategies to manage stress and address the situation
3) Rehearsing such strategies as needed to support the youth's effective implementation of skills in the moment/situation

4) Monitoring youth while they are using these skills or having the youth share self-reflections of their implementation soon afterwards
5) Encouraging the youth to self-praise efforts if successful, and if not, to problem-solve their strategies or revise their goals
6) Connecting their efforts and progress to the youth's long-term goals and sharing perspectives on their future.

**Provide strong co-regulation support to pregnant teens so that they have enough emotional, cognitive, and behavioral self-regulation skills to begin parenting.** This support is needed so that adolescents and young adults beginning their own families can learn to self-regulate under the stress of new parenthood as well as learn to provide co-regulation for their expected children. This message is consistent with the Center for Disease Control's promotion of Safe, Stable, and Nurturing Relationships (SSNRs) as a protective factor for early childhood adversity including maltreatment. As specified on the FRIEND's website (http://friendsnrc.org/cbcap-priority-areas/well-being-and-the-young-child/early-years), providers (such as maternity group home staff) can "support healthy parent-child relationships by creating responsive relationships with parents. This, along with other needed supports, enhances parents' capacity to offer nurturing care to their young children." However, teen mothers are likely to need long-term support in building and practicing self-regulation skills in order to gain self-sufficiency as well as to reduce the risk of self-regulation difficulties in the next generation. One approach that may serve this population well is evidence-based home visiting programs that provide support prenatally and continue through the first few years of the baby's life.

### Acknowledgments

## Conclusion

This report is intended to encourage programs and funders to consider a self-regulation framework for supporting the development and wellbeing of children and youth.  This framework capitalizes on important recent findings from developmental neuroscience while building upon existing interventions and practices.  Such an approach has potential to enhance outcomes by providing more targeted and intentional supports for self-regulation development across settings and development.  The key strategies identified here for consideration  are based on a series of reports prepared for ACF on Self-Regulation and Toxic Stress including two comprehensive literature reviews and extensive feedback from ACF program officers.  Additional resources including several briefs are being prepared to support the future work proposed including professional development for program staff.

## References

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