



A TRAINING AID TO

Building Resilience

SUPPORTING THE EDUCATION
OF ADVERSE CHILDHOOD
EXPERIENCES AND THE
NEED FOR RESILIENCE

Please use this as inspiration to create your own resources, start discussions, change conversations and educate and train our community on ACEs and it's essential partner, Resilience.

WRITTEN BY DR SHOSHANAH LYONS & HELEN TOWNSEND

What is classed as an Adverse Childhood Experience?



Emotional Abuse: A parent or other adult in the household who often or very often... swears at the child, insults the child, puts the child down or make their child feel humiliated or acts in a way that the child is afraid they may be physically hurt.



Physical Abuse: A parent or other adult in the household often or very often... pushes, grabs, slaps, or throws something at the child or ever hits the child so hard that marks are made or the child is injured.



Sexual Abuse: An adult or person touches or fondles this child or has the child touch their body in a sexual way? An attempt to have or have oral, anal, or vaginal intercourse with the child?



Emotional Neglect: The child often or very often feels that ... no one in their family loves them or thinks they are important or special? Their family doesn't look out for each other, feel close to each other, or support each other?



Physical Neglect: The child often or very often feels that ... they don't have enough to eat, have to wear dirty clothes, and has no one to protect them or their parents are too drunk or high to take care of them or to take them to the doctor if they needed it?



Adult Relationships: Are the child's parents separated or divorced?



Spousal Abuse: Is the child's mother/father or stepmother/father: often or very often pushed, grabbed, slapped, or has something thrown at her/him? Or sometimes, often, or very often kicked, bitten, hit with a fist, or hit with something hard? Or ever repeatedly hit over at least a few minutes or threatened with a gun or knife?



Substance Abuse: Does the child live with anyone who is a problem drinker, alcoholic, or who uses street drugs?



Mental Illness: Is a household member depressed, mentally ill, or has a household member attempted suicide?



Incarceration: Has a household member gone to prison?

Reflection Points

- As an adult, what is the impact on your personal/professional life if you have ACEs?
- Would the community you live and/or work in, consider all of these ACEs?
- Who needs to know that these are Adverse Childhood Experiences?
- How would you communicate what ACEs are to a child?

Adverse Childhood Experience Studies

In 2015, Wales carried out an ACE study on 2028 people. They asked about these stressful experiences that occurred during childhood. The results were:



Within this study, they found people who experienced 4 or more Adverse Childhood Experiences were:



Reflection Points

- Can you see this pattern in your own professional experiences?
- Reflect on your own awareness and perception of what has happened to a child before they came into your life and/or what is happening to them now?
- Who needs to see this research?

The Original Study

The original study was carried out in America. **17,000 patients were asked about ACEs** and their later emotional, behavioural and health outcomes (*Andra et al 2006*). The results, similar to our UK study, shocked doctors into taking action against Adverse Childhood Experiences. Information on the original study can be found here: <https://www.cdc.gov/violenceprevention/cestudy/about.html>

The Bottom Line:

The evidence shows there is a stark dose-response relationship between the number of ACEs a person experiences, and their increased risk of mental health, physical health and anti-social behaviours. The patterns are the same across all socio-economic groups (*70% are college educated*).

Adverse Childhood Experiences are not confined to the under privileged – they are all around us.

Bad stuff is common, it happens to everybody.



Reflection Points

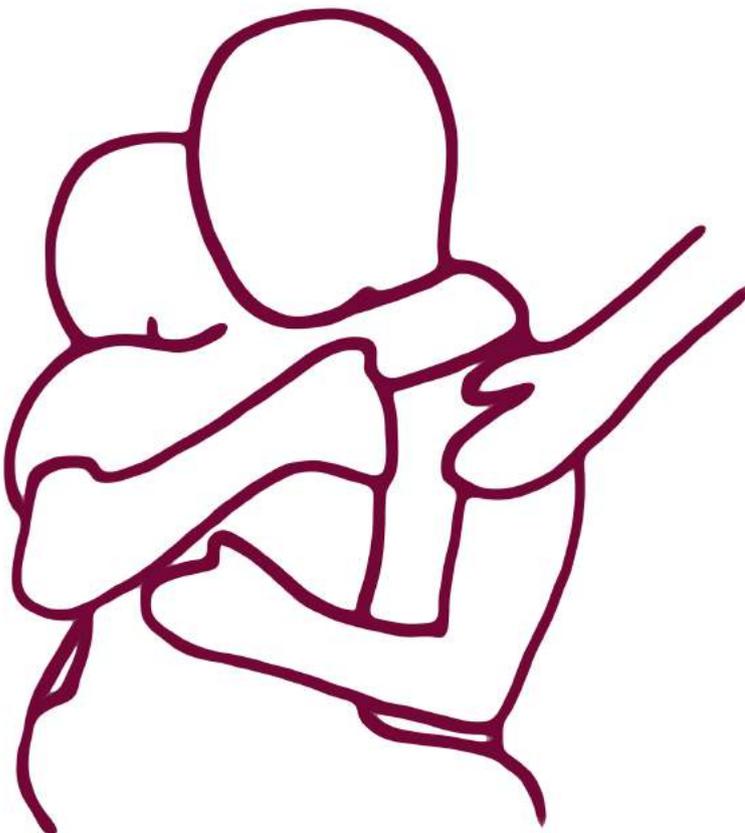
- The research shows that ACEs travel across the classes, how does this challenge your perception of who experiences ACEs?
- Whose responsibility is it to ensure that the children in our community have the chance to grow up into healthy adults?

What is Resilience?

Now we know that bad stuff happens to everybody, we need to build a child's resilience, but **they aren't born with it, we have to build it.**



Resilience is **being able to bounce back and stay grounded after bad stuff happens** and it is vital for every child to have it. Resilience supports healthy development and learning and significantly improves health outcomes in later life.



When Building Resilience:

Consider the child **AND** the parent.

A child's greatest resource is a safe, resilient and loving adult so it is important to reflect on what you are also doing as/for a parent.

Reflection Points

- What resource could you make to show adults or children how Resilience develops in children?
- What do you currently have in place that is designed to build 'Resilience' in children and their parents? Is it obvious or hidden?

Educate

Working together as a community is more effective (and less tiring) than doing it alone.

The Power of Parents:

- Use this training aid to educate the people in your child's world who they regularly come into contact with, (Family, Teachers, School Governors, GP, Health Visitor etc.,) on ACEs and building resilience.
- **Get Heard:** Apply polite pressure to your GP, Local Authority, Police, MP, Schools, Churches etc., to get educated in ACEs and how to build community resilience. What do they know about Adverse Childhood Experiences? Have they seen the Welsh study?

The Power of Professionals:

- Educate your families and their children using ideas inspired by this training aid
- Organise 'In-Service Training' inspired by this training aid, talk to colleagues, share your knowledge. Join together and form an ACE task force. Organize or request training for your work place which delves deeper into toxic stress and the repair of early trauma.
- Arrange a screening of Resilience, invite the community - other companies, organizations, social enterprises, local authorities, schools, prisons etc.

Reflection Points

- What can you turn this training aid into? A PowerPoint presentation? Interactive resources? Online program? A Resilience tool box?
- Who needs to know, who can best help you share this message?

A Safe Base

A child and parent/carer needs a safe base in home, school and in the community. How are you teaching them that they should have:

Physical Safety: An environment where they are safe from being physically hurt. For example, where no-one will kick, hit, shake, drown or burn or deliberately pretends a child is ill or purposefully makes them ill.

Emotional Safety: An environment where they are safe from being emotionally hurt in any way. For example, shaming, teasing, taunting, threatening, isolating, ignoring, inappropriate expectations or silencing.

Social Safety: An environment where they can be taught how to make positive and meaningful relationships with other people. For example, key adults model respectful relationships with other parents, colleagues & professionals and the child has opportunities to meet and socialize with their peers and a school environment where relationships are prioritized.



Cultural Safety: An environment where their background and experiences are respected and acknowledge as valid and important. For example, they are treated with respect, kindness and curiosity. Their history and culture is considered when making decisions about the child.

Reflection Points

- How can this information be safely communicated to the children and young people you work/live with? Consider the culture, community and family dynamics.
- What do you have in your local area to support your child or young person if they share something with you that results in safeguarding concerns?

Connection



A child/parent needs at least one person in their life who understands that the child is doing the best they can given his or her experience.

Do they have the opportunity to build relationships with key adults by:

- The key person/people always being there and never giving up?
- Being listened to, feeling heard?
- Receiving a consistent positive response?
- Experiencing kind humor?
- Being treated with respect?
- Being surrounded by flexible but consistent adults?

Do they have the opportunity to build relationships with their peers by:

- Experiencing adults around them modelling productive communication and positive relationships?
- Attending school: sharing friends, resolving conflicts?
- Giving and receiving peer support?
- Experiencing extra curricular activity/s (excessive amounts may interfere with the key adult relationships)

Do they have the opportunity to build relationships with their community by:

- Being curious about where they live?
- Being exposed to and moving between different cultures within their community?
- Understand the value of serving others in their community?
- Hearing stories of human resilience?

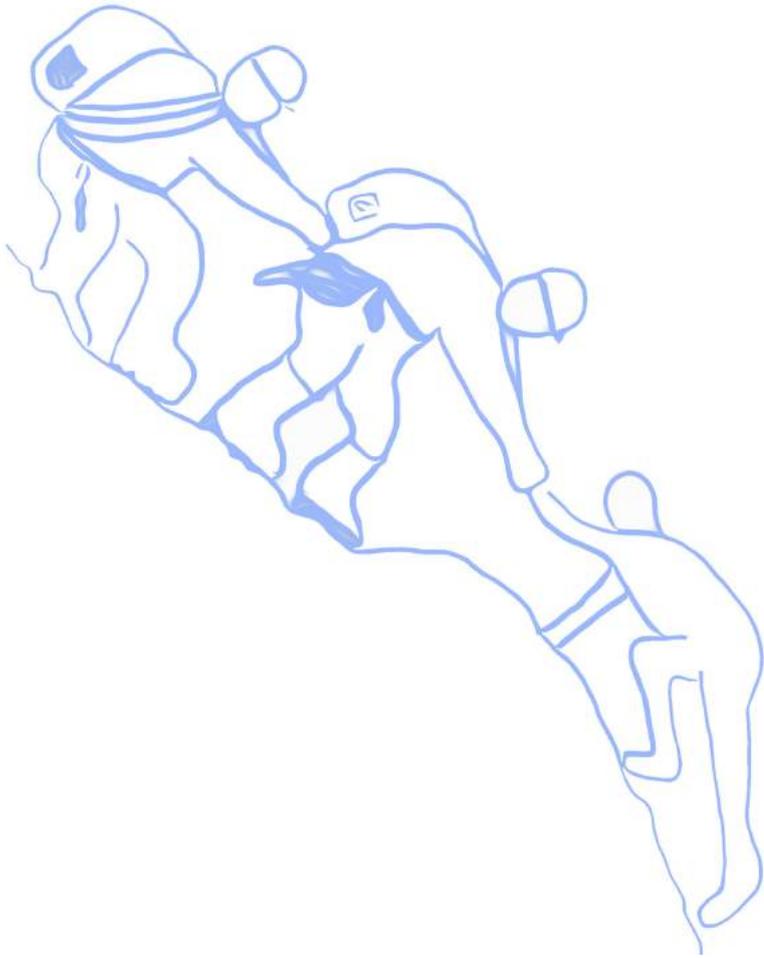
A simple way to check your connection: Does the child know I like them?

Reflection Points

- How can you teach a child what to expect from their relationships?
- What can you do to support a child's relationship with their key adult, peers and their community?
- How does the key adult and the child currently connect? How can you help?

Competence & Confidence

The Power of Your Relationship. How do you...



Build on a child's/parent's individual and unique strengths to give them **confidence in their abilities?**

Set high but realistic expectations/goals for that individual child/parent so they can learn how to **aspire and achieve?**

Can you see the best in them so they feel **confident and connected** in your relationship and about their future?

Do you 'catch them' being good and praise qualities instead of achievements so they have **hope and persistence?**

Treat them as capable human beings so they feel **competent and worthwhile** and in turn building their **self-esteem?**

Reflection Points

- Could you take each statement one at a time and think of an action/resource/person that could build and strengthen the child and parent?
- Reflect on how you model each statement to the children/parents you live/work with. What do you do well and how can it be enhanced? What could you improve?

Competence & Confidence

Empathy = Validation = Self Esteem = Emotional Resilience

Empathy is the ability to understand and share the feelings of another without taking it on as your own.

Ask 'What happened to you?' instead of 'What's wrong with you?'

Stop what you're doing, pay attention and listen

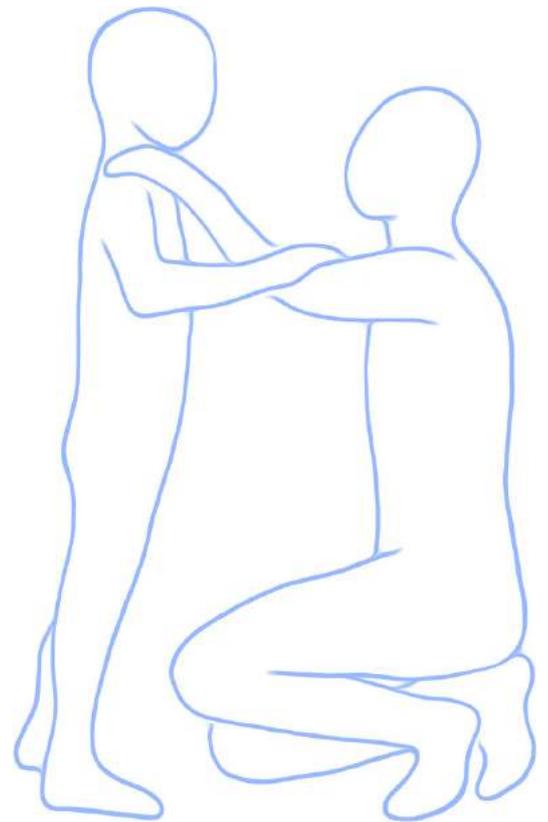
Respect the person's story, no judgement

Be patient, wait until they're finished before speaking

Imagine how you would feel if it was you

Acknowledge the feeling behind the behaviour

Empathy can be easier to do when a child is hurt or sad but empathy is also a **powerful tool for challenging behavior**. When a decision has resulted in unsafe or undesirable behavior, acknowledging the feelings behind the behavior will make the child feel heard and more open to accepting a consequence to their actions.



Reflection Points

- Do you find empathy easy or tricky?
- What does empathy look like for you when faced with challenging behaviour?
- How can you teach a child and/or their parent empathy? What resources could you make to communicate empathy in different ways?

Problem Solving

Do you allow a child to make safe mistakes?

Pause, take a breath, wonder aloud 'how would the child fix the problem?'. Questions can help with direction, however, give them the choice and chance to work it out for themselves.

With empathic support from a key adult; failing, conflict resolution, losing or not succeeding, can be empowering and creates a resilient, resourceful and courageous adult.

They will be able to think critically, creatively and reflectively – all by being allowed to make safe mistakes.



Supporting a child through failure contributes to one of the best developmental outcomes you can give that child.

Reflection Points

- What does failure mean to you? Reflecting on this will help you in supporting a child through their own.
- How could you teach a parent about safe mistakes?
- What resources could you make to communicate the importance of failure to a child?

Autonomy

Are they being taught how to make good decisions?

Are they allowed to take **responsibility** and **master** appropriate tasks?

Do they know how to **repair** – do they know how to make a genuine apology? Do they have a key adult model repair?

Can they discover who they are? By developing a core **sense of identity**, they will refuse to accept negatives beliefs about themselves from others.

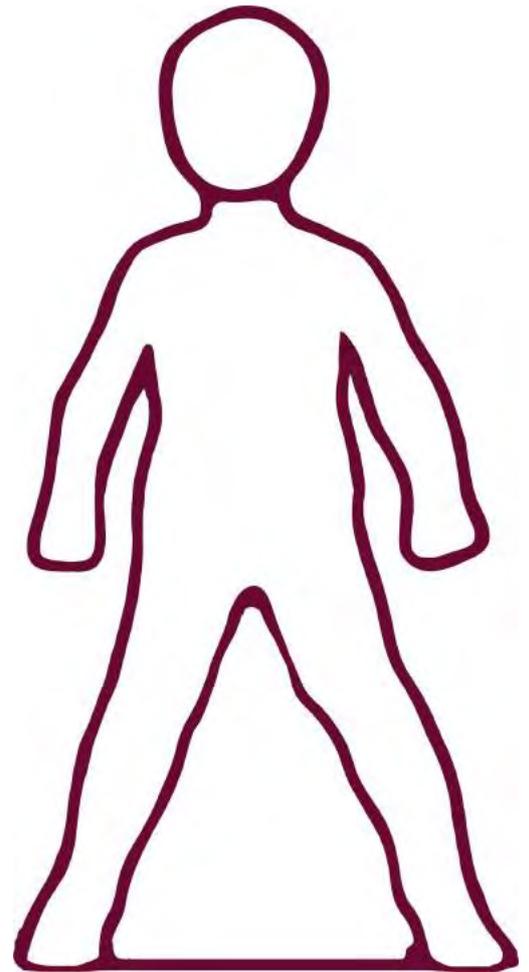
Do they have **appropriate control** over their environment and decision making?

Are they supported in making **sense of their world** and in understanding the experiences they have had?

Are they allowed to experience **ALL feelings** not just the good ones?

Is **self expression** and **self reflection** encouraged to help them make appropriate choices in the future?

Can they sustain relationships with **positive, kind humour**?



Reflection Points

- Does the child/young person have a key adult modelling 'good decisions' and if not, what or who could be put in place to encourage and support this?
- Take each statement in turn, what resource could you make to communicate them to parents and/or children?

Modelling Behavior

Self Reflection: Do you have any unresolved ACEs that contribute to your reactions as a parent and/or professional? What happened to you?

With this in mind, how do you:

- Problem solve?
- Communicate?
- Show different emotions?
- React when you are triggered?
- Cope when things go wrong?
- Let go of things that cant be solved?
- Repair your relationships?

It is not just positive behaviours children and young people need to see us modelling. How we convey, react and cope with negative emotions is also modelling behaviour.

Knowing where you go is a first step to staying connected when times are tough.



Reflection Points

- Who can support you to safely reflect on your own ACEs?
- What support/resources/ideas can be put in place to support you once you have worked out what triggers you?
- What resources could you create to help a parent reflect on their own ACEs?

Self-Care



How are you looking after yourself?

- What do you feel guilty about?
- What makes you anxious?
- How do you sleep?
- What do you do to relax?
- What do you do to have fun?
- What do you do for exercise?
- How is your nutrition?

With these questions in mind, are you adequately looking after yourself so you can look after others?

How are you looking after the parent/carer of this child?

- Are their support resources sufficient? Do they ask for help?
- Do they model self care to their children?
- What do you have in place that cares for the parents emotional health?
- How do you treat the parent/carer of this child?
- Do they know you like them?

How can you actively focus and build upon parental resilience – ultimately this is the most helpful response in preventing and repairing trauma in children and young people.

Reflection Points

- Does the resources you have balance out the demands in your life so self care is possible?
- How could you creatively explore self care with a parent/carer and their child?
- What support is in the local community to support parents/carers with self care?

Challenges

There will always be obstacles, how can we re-frame the issues?

Budgetary Constraints: What can you do with the resources you have? Where would a culture change make the difference? How could existing funds be spent differently? What creative ways of thinking could result in needed change without requiring funds?

It's hard to explain: Can you use each slide from this presentation as the basis for a visual training resource? Who is the person you are trying to explain it too, how do they learn? Can you change the way you're communicating the information.

I work alone: What can I do independently? How does working alone free me up to spread the message?

I work for a huge company, no-one will listen: Who is the greatest resource? Who can I start with? Who is great at communicating to the rest of the team?

I don't know what to do: Where can I learn more? Who can I ask for inspiration?

I want to do more: Who can I ask for help? What is my first action?

I have already tried: What worked, what can I build on?

Reflection Points

- What is your biggest challenge when trying to build Resilience in your community? What happens when you reflect on the opposite of this challenge?
- How can you re-frame your biggest challenge into a positive? Who could help you do this?

Useful Links

The Sussex Community Resilience Project:

<https://www.facebook.com/TheSussexCommunityResilienceProject>

Inspiration: <http://www.suzannezeedyk.com> and <http://reattachparenting.co.uk>
and <https://www.tigersltd.co.uk/news/281-making-scotland-the-world's-first-ace-aware-nation.html> and <http://connectedbaby.net>

Screening Details: <http://dartmouthfilms.com/resilience-screenings-info> and
<http://kpjrfilms.co/resilience/>

Welsh ACE Study: <http://www.cph.org.uk/wp-content/uploads/2016/01/ACE-Report-FINAL-E.pdf>

Developmental Trauma Close Up: <http://beaconhouse.org.uk/developmental-trauma/developmental-trauma-close-up/>

Repair of Early Trauma: <http://beaconhouse.org.uk/developmental-trauma/the-repair-of-early-trauma-a-bottom-up-approach/>

Repair of Early Trauma Animation: <http://beaconhouse.org.uk/developmental-trauma/animation-the-repair-of-early-trauma/>

Free Support Resources: www.innerworldwork.co.uk and <http://www.70-30.org.uk/infographics/>

Miss Kendra's List:

<http://www.traumainformedschools.org/programs/misskendraslist.html>

Professionals: Adding the ACE questionnaire to your information gathering database will help you to provide a more effective trauma informed response to the families you are working with. The questionnaire and guidelines can be found here:

http://www.who.int/violence_injury_prevention/violence/activities/adverse_childhood_experiences/en/



Help your children build resilience.

Resilience can be built in many ways, and we have a great opportunity to help our children with that now. Make family time for yoga or exercise and notice how much better everyone feels. Visit [heysigmund.com](https://www.heysigmund.com) for more strategies that build resilience in children.

#ctfresilienttogether

CHILDREN'S
TRUST FUND
Alliance[™]

National Parent Partnership Council (ANPPC)

ctfalliance.org

<https://www.heysigmund.com/building-resilience-children/>

Resilience Booster: Parent TIP TOOL

Even with the best resources available, meeting the needs of family members in today's fast-paced society is difficult. The daily stress of making ends meet can take a toll on all family members, including children.

Parenting
is hard
work.

While it may be difficult to change circumstances such as housing, employment, and transportation, there are things parents can do to reduce the effects of stress and to help their children develop resilience. Resilience is the ability to recover from or adjust easily to adversity or change. It is important because it allows us to overcome negative experiences, and it is an ability that, when supported appropriately, develops throughout childhood. There is a large body of research supporting the importance of building resilience to help prevent negative consequences of environmental stressors.

WITHOUT RESILIENCE,
children are at risk for poor outcomes in the following areas:



Cognitive: Delayed Language Learning ~
Language Learning Difficulties ~ Memory Difficulties ~
Reduced Ability to Focus/Concentrate ~
School Readiness/Academic Failure

Emotional: Self-Regulation of Emotion ~
Self-Regulation of Behavior ~ Poor Impulse Control ~
High Emotional Reactivity

Physical: Weakened Immune System ~
Changes in Brain Development ~ Obesity ~
Mental Health Problems ~ Chronic Health Issues

Social: Aggression ~ Peer Rejection ~
Hostile Perceptions ~ Volatile Relationships

Parents have the power to make an enormous difference in the outcomes of their children's development. Child Development Research has become more sophisticated and provides more in-depth evidence of when, where, and how parents can protect their children from environmental stressors impacting their lives and development.

This guide is organized according to children's environments, where parents might have greater opportunities to help them build resilience. Think of other ways to adopt resiliency practices in your child's daily experience.

Pass it on— share your experiences with others, on social media, and with us. Email us at oses@apa.org or tweet #resiliencebooster.

**Warm
and nurturing
relationships between
children and the adults
in their lives are the most
important factor in developing
resilience and overcoming
potential negative effects
of daily stress.**



APA Office on Children Youth and Families in collaboration with
the Office on Socioeconomic Status



The home is your child's first environment, and the one where she will spend the most time over the course of childhood. Your home is the most important environment for developing resilience. Key principles to support healthy development in the home include structure and fostering a close, warm relationship.

Structure

Children need to know what to expect and what is expected of them. This structure provides a sense of security and comfort. Structure helps to reduce the sense of chaos or disorganization that can be created by stress. To create structure:



Establish and stick to family routines

- ✓ Meal times
- ✓ Bed times
- ✓ Homework times
- ✓ Hygiene routines
- ✓ Traditions, such as family game night, weekend walks, or movie night

Create rules and expectations and apply them consistently

- ✓ One key to effective parenting and discipline is to let your child know what is expected of him, what to expect if he doesn't do what he is supposed to, and then to follow through, every time.
- ✓ While change may be necessary, reduce the chaos of change by maintaining routines and manage expectations about the approaching changes.

Foster a close, warm relationship

Warm relationships help children feel secure, especially when faced with ongoing daily stress. It is possible to maintain a warm, nurturing relationship and strong rules and expectations at the same time.

Talk about emotions. Children need to learn how to appropriately express and regulate emotions. They look to parents as models for all sorts of behaviors, including emotion regulation.

- ✓ Express your feelings, including anger and sadness: "When accidents happen, I feel frustrated/sad/angry."
- ✓ Talk about the emotions expressed in the world around you. Discuss how characters in books or movies feel about what is happening, how siblings, relatives, or classmates feel about events, or how it might feel to experience something new.
- ✓ Talk to your child about her emotions, both positive and negative. Talking with children about their feelings helps them recognize those feelings and learn how to regulate them effectively.



Model and discuss self-control. The ability to regulate emotions and behavior is essential for succeeding in school, at work, and in social relationships.

- ✓ When talking about how you feel, also talk about what you will do to appropriately express or release those feelings.
- ✓ Model the behavior you want to see in your child, including responses to anger.
- ✓ Play games that support self-control, like musical chairs, or red light/green light.

Model and discuss problem solving

- ✓ Share how you resolve problems, large and small, from what to make for dinner to how to make sure the bills are paid.
- ✓ Play games that ask your child to come up with solutions.
- ✓ When your child has a question or a problem, instead of offering suggestions immediately, start with questions, such as, “What do you think might work?” Help him think through his ideas before offering suggestions of your own, and discuss them too.



Build strong communications skills. Both understanding and using language are important for successful interactions. Communication skills, including a strong vocabulary and correct language use are strongly linked to academic success.

- ✓ Make up family stories in which family members take turns adding something.
- ✓ Talk to your child about your day, and ask about her day.
- ✓ Read together, every day if possible, from birth. As your child begins to read, take turns reading to each other.
- ✓ Sing and dance together.

In the Neighborhood and Community

Your neighborhood provides your child with his first exploration into the world. Although you cannot control all of the factors in your neighborhood, you can build and take advantage of resources that support resilience.

Get to know your neighbors and form close relationships. Neighbors are an important source of support and social interaction. Relationships with neighbors create the social structure in neighborhoods that foster a sense of belonging and caring, social-monitoring to protect and support each other, and positive feelings about the neighborhood.

Seek out resources within your community. Although community services may be limited where you live, seek out any that are offered, and take advantage of all that you can.

- ✓ **Libraries** offer learning opportunities, entertainment programming, and educational programming in addition to lending books.
- ✓ **Community Centers/YMCAs/Boys and Girls Clubs** offer sports programming, social events, entertainment, and educational opportunities at no or low cost, often with lower costs based on income eligibility.
- ✓ **Churches and Faith-Based Institutions** often provide child care, before/after school care, and other youth development programs. They can also facilitate your child's relationships with others around pro-social activities.



- ✓ **Museums & Parks** often have free or low-cost admission fees and special activities for children and youth.
- ✓ **Community groups organized around issues or activities** – If you have questions or concerns about the way things work in your town or city, get involved. The best way to ensure change is to be a part of it.
- ✓ **VOTE** – If you don't have time to take up an issue, you can look for public officials who will address those issues. Find out about the positions on issues important to you of those running for office, and use your vote to seek change.

How can my child care help?

Even when you have limited options for child care, there are important factors you can look for to ensure that this environment will support your child's developing resilience. Basically, the child care environment should mirror the home environment in many ways. Look for child care providers who:

- ✓ **Help** children feel safe, protected, and valued
- ✓ **Get** down on the child's level to interact
- ✓ **Talk** with children respectfully
- ✓ **Interact** frequently and regularly with the children, rather than simply supervising them
- ✓ **Demonstrate** sensitivity to the children's needs and feelings
- ✓ **Play** pre-reading and pre-math games, games that foster imagination and problem-solving, games that practice self-control, and games that discuss and model feelings



How can my school help?

As with child care, you may have few or no options about the schools your child attends. But, there are things you can look for in a teacher or school when considering which teacher to request for the next year, and suggestions you can make to the PTA and School Board for improving the school.

- ✓ Positive, sensitive or caring, and respectful teacher attitude
- ✓ Teachers who reinforce instances of good behavior and good performance
- ✓ Teachers and schools who do not treat children differently or have different expectations of students from different backgrounds or with different test scores
- ✓ Classrooms with mixed child ability levels and interaction of children across ability levels
- ✓ Options for student participation and activities beyond basic reading and math
- ✓ Schools with an emphasis on attendance

References

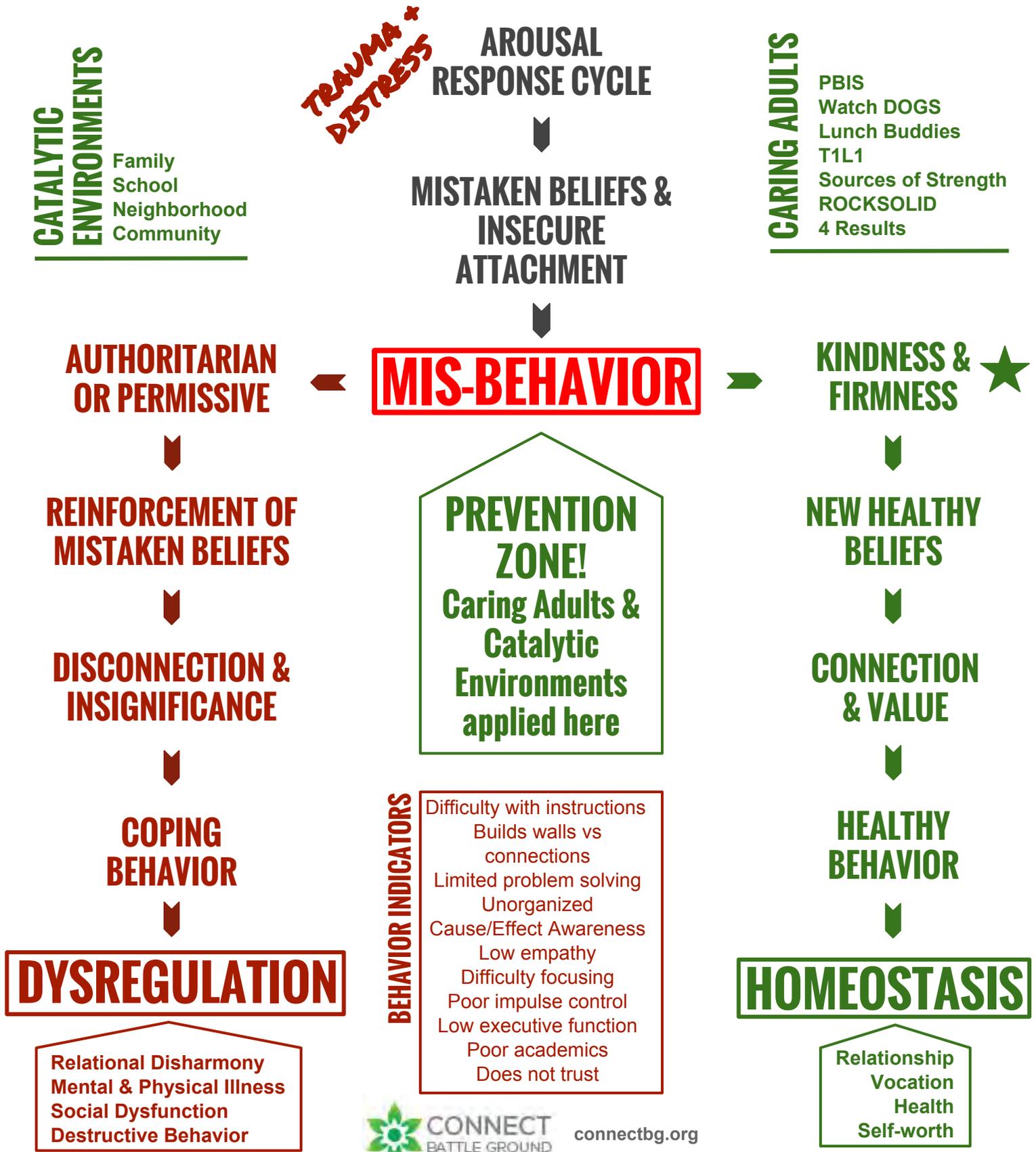
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- Malhomes, V. & King, R.B. (Eds.) (2012). *The Oxford Handbook of Poverty and Child Development*. New York: Oxford University Press.
- McLoyd, V.C. (1998). Socioeconomic disadvantage and child development. *American Psychologist*, 53(2), 185-204.
- Thompson, R.A. (2014). Stress and child development. *The Future of Children*, 24(1), 41-59.

Additional Resources and Links

- Center for Disease Control and Prevention Child Development Resource
<http://www.cdc.gov/ncbddd/childdevelopment/>
- Center on the Developing Child at Harvard University
<http://developingchild.harvard.edu/>
- Thirty Million Words Initiative at University of Chicago | <http://tmw.org/>
- Zero to Three | <http://www.zerotothree.org/>
- Too Small to Fail | <http://toosmall.org/>
- PBS Parents | <http://www.pbs.org/parents/>
- National Association for the Education of Young Children for Families
<http://families.naeyc.org/>

Resilience Strategy

The foundations of misbehavior are established before birth as children experience distress in their arousal response cycle and develop mistaken neurological beliefs and goals. If connection & significance experiences are reinforced early in life, trajectory can be directed toward resilience.



flexible thinking

impulse control



planning and prioritizing

executive functioning skills

task initiation

self-monitoring

organization

let's land this plane!



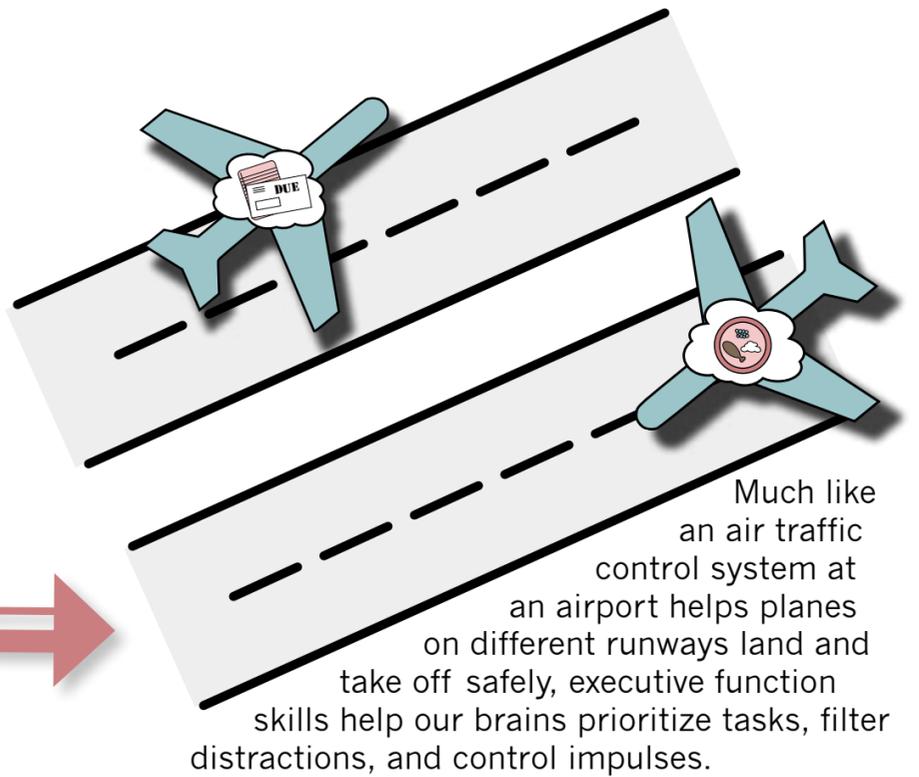
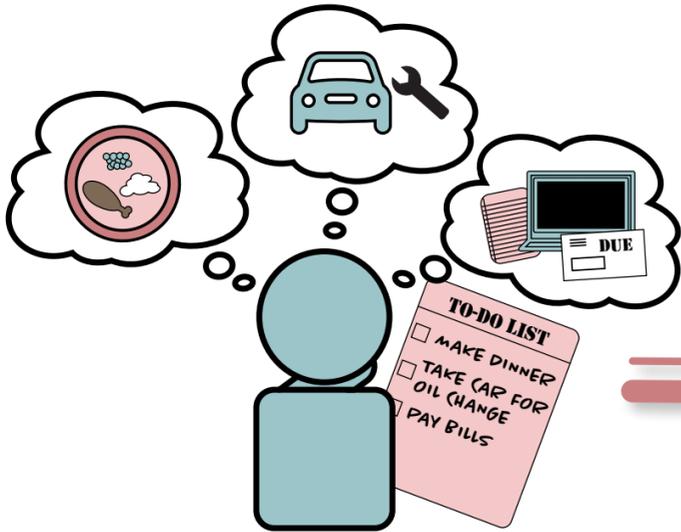
working memory

emotional control

WHAT IS EXECUTIVE FUNCTION?

AND HOW DOES IT RELATE TO CHILD DEVELOPMENT?

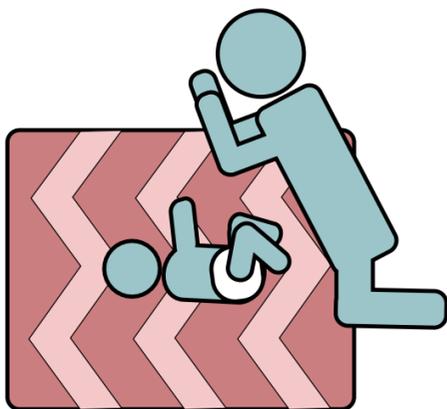
The phrase “executive function” refers to a set of skills. These skills underlie the capacity to plan ahead and meet goals, display self-control, follow multiple-step directions even when interrupted, and stay focused despite distractions, among others.



Much like an air traffic control system at an airport helps planes on different runways land and take off safely, executive function skills help our brains prioritize tasks, filter distractions, and control impulses.

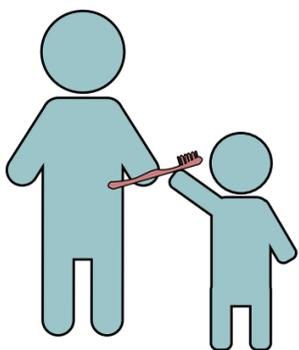
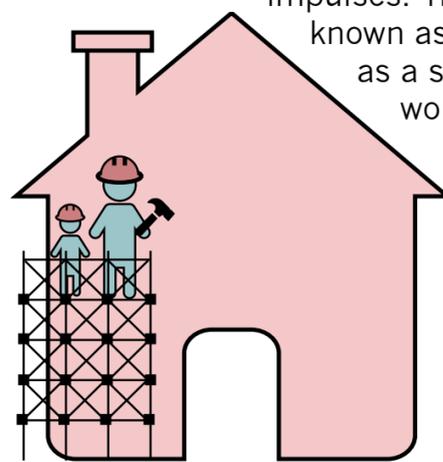
NO ONE IS BORN WITH EXECUTIVE FUNCTION SKILLS, BUT NEARLY EVERYONE CAN LEARN THEM.

Our genes provide the blueprint for learning these skills, but they develop through experiences and practice. The foundation is laid in infancy, when babies first learn to pay attention. Relationships with responsive caregivers are particularly important at this stage. Something as simple as playing a game of peekaboo can help build the early foundations of working memory and self-control as a baby anticipates the surprise.



Adults set up the framework for children to learn and practice these skills over time by establishing routines, breaking big tasks into smaller chunks, and encouraging games that promote imagination, role-playing, following rules, and controlling impulses.

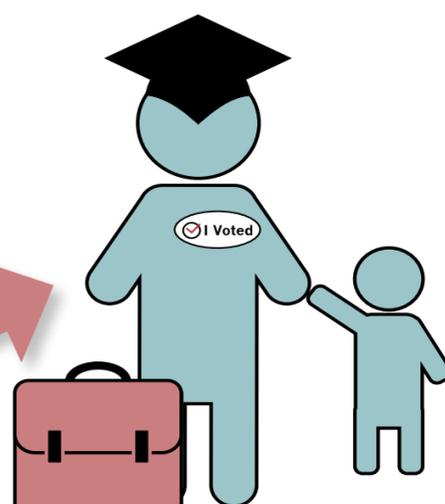
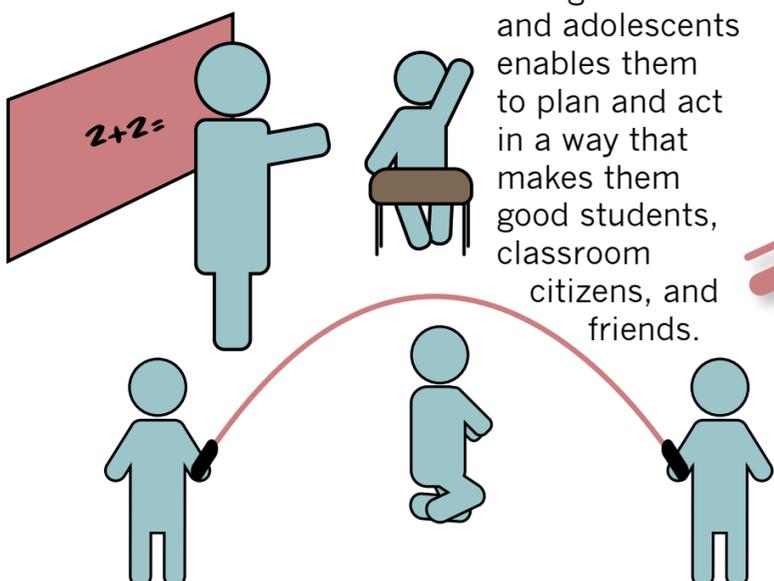
These techniques are known as “scaffolding.” Just as a scaffold supports workers while a building is being constructed, adults can use these activities to support the emergence of children’s executive function skills until they can perform them on their own.



These skills typically develop most rapidly between ages 3-5, followed by another spike in development during the adolescent and early adult years. It takes a long time and a lot of practice to develop them, but, as children’s executive function skills grow, adults can gradually allow children to manage more and more aspects of their environment.

BUILDING CHILDREN’S EXECUTIVE FUNCTION SKILLS BENEFITS EVERYONE.

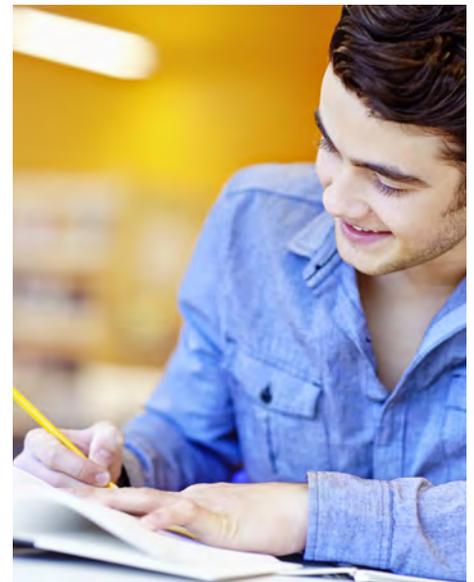
The increasingly competent executive functioning of children and adolescents enables them to plan and act in a way that makes them good students, classroom citizens, and friends.



In turn, this helps them grow into adults capable of juggling a multitude of commitments, such as parenting, employment, continuing education, and civic involvement. Even health is affected, as strong executive function helps people stick to healthy habits

and reduce stress. The more a society invests in building the executive functioning of its children, the greater dividends it will see in the future.

Enhancing and Practicing Executive Function Skills with Children from Infancy to Adolescence



Introduction

Executive function and self-regulation skills provide critical supports for learning and development. Just as an air traffic control system at a busy airport manages the arrivals and departures of many aircraft on multiple runways, executive function skills allow us to retain and work with information in our brains, focus our attention, filter distractions, and switch mental gears. There are three basic dimensions of these skills:

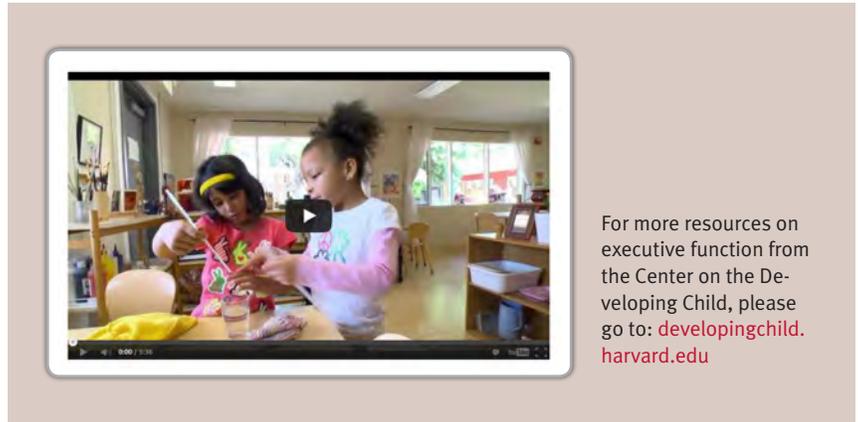
- **Working memory** — The ability to hold information in mind and use it.
- **Inhibitory control** — The ability to master thoughts and impulses so as to resist temptations, distractions, and habits, and to pause and think before acting.
- **Cognitive flexibility** — The capacity to switch gears and adjust to changing demands, priorities, or perspectives.

These skills help us remember the information we need to complete a task, filter distractions, resist inappropriate or non-productive impulses, and sustain attention during a particular activity. We use them to set goals and plan ways to meet them, assess our progress along the way, and adjust the plan if necessary, while managing frustration so we don't act on it.

Although we aren't born with executive function skills, we are born with the potential to develop them. The process is a slow one that begins in infancy, continues into early adulthood, and is shaped by our experiences. Children build their skills through engagement in meaningful social interactions and enjoyable activities that draw on self-regulatory skills at increasingly demanding levels.

Acknowledgements

The Center on the Developing Child wishes to extend deep thanks to Jocelyn Bowne for drafting this manuscript. Thanks also go to Maia Barrow, Silvia Bunge, Deborah Leong, and Philip Zelazo for their thoughtful feedback and suggestions. Their expertise was invaluable in compiling these games and activities. Any errors or omissions are the sole responsibility of the Center on the Developing Child.



For more resources on executive function from the Center on the Developing Child, please go to: developingchild.harvard.edu

In infancy, interactions with adults help babies focus attention, build working memory, and manage reactions to stimulating experiences. Through creative play, games, and schoolwork, children practice integrating their attention, working memory, and self-control to support planning, flexible problem-solving, and sustained engagement. By high school, students are expected to organize their time (largely) independently, keep track of their assignments, and manage projects to completion.

As children develop these capacities, they need practice reflecting on their experiences, talking about what they are doing and why, monitoring their actions, considering possible next steps, and evaluating the effectiveness of their decisions. Adults play a critical role in supporting, or “scaffolding,” the development of these skills, first by helping children complete challenging tasks, and then by gradually stepping back to let children manage the process independently—and learn from their mistakes—as they are ready and able to do so.

The activities that follow have been identified as age-appropriate ways to strengthen various components of executive function. Although scientific studies have not yet proven the effectiveness of all these suggestions, their presence here reflects the judgment of experts in the field about activities that allow children to practice their executive function skills. Practice leads to improvement. These activities are not the only ones that may help; rather, they represent a sample of the many things children enjoy that can support healthy development.

Finally, please note that when websites and products are referenced in these activity suggestions, it is because they are helpful resources or examples. Their inclusion does not imply endorsement, nor does it imply that they are the only, or necessarily the best, resources.

Executive Function Activities for 6- to 18-month-olds

These activities encourage infants to focus attention, use working memory, and practice basic self-control skills. During this stage of development, infants are actively developing their core executive function and self-regulation (EF/SR) skills. Supportive, responsive interactions with adults are the foundation for the healthy development of these skills. However, particular activities can strengthen key components of EF/SR.

In using these activities, adults should attend to the infant's interests and select activities that are enjoyable, while also allowing the infant to determine how long to play.



Lap games for younger infants

Generations of families have engaged babies in games while holding them in the lap. Different games practice different skills, but all are predictable and include some basic rules that guide adult and child behavior. Repetition helps infants remember and manage their own behavior to fit the game's rules.

■ **Peekaboo** — Hide-and-find games like this exercise working memory, because they challenge the baby to remember who is hiding, and they also practice basic self-control skills as, in some variations, the baby waits for the adult

to reveal him or herself. In other versions, the baby controls the timing of the reveal; this provides important practice regulating the tension around an expected surprise.

■ **Trot, Trot to Boston; This is the Way the Farmer Rides; Pat-a-Cake** — Predictable rhymes that end with a stimulating yet expected surprise are well-loved. Infants exercise working memory as they develop familiarity with the rhyme and practice anticipating a surprise, inhibiting their anticipatory reactions while managing high levels of stimulation.

Hiding games

Hiding games are a great way to challenge working memory.

■ **Hide a toy under a cloth** and encourage the infant to look for it. Once infants can find the toy quickly, hide it, show the child that you have moved it, and encourage the child to find it. Make more moves to increase the challenge. As the child remembers what was there and mentally tracks the move, he or she exercises working memory.

■ **Older infants may enjoy hiding themselves** and listening to you search loudly for them while they track your location mentally.

■ **You can also hide an object** without showing an older infant where it is and then allow the infant to search for it. He or she will practice keeping track of searched locations.

■ **Another challenging version** of these games involves putting a set of cups on a turntable (or "lazy Susan"), hiding an object under a cup, then spinning the turntable. Hiding more than one object can also increase the challenge.

Imitation or copying games

Infants love to copy adults. When they imitate, they have to keep track of your actions, remember them, wait their turn, and then recall what you did. In doing so, they practice attention, working memory, and self-control.

■ **These games have a variety of forms**, from taking turns making simple gestures (e.g., waving) to organizing toys in certain ways and asking children to copy you (e.g., placing toy

animals in a barnyard) or building simple buildings by putting one block on top of another and perhaps knocking them down to rebuild.

■ **As infants' skills improve**, make the patterns they copy more complicated.

■ **Adults can also demonstrate** ways to play with toys, like making a toy horse gallop or rocking a baby doll. This introduces the concept of using toys as symbols for real objects.

Simple role play

Older children in this age range enjoy doing the tasks they see you do.

■ **Take turns with any activity** that interests the child, such as sweeping the floor, picking up toys, dusting, etc. These games introduce the basics of imaginary play and practice working memory, self-control, and selective attention, because the toddler must hold the

activity in mind to complete it while avoiding distractions and inhibiting the impulse to do other things.

■ **Children can remember and play out** more complicated roles as they get older. They will also begin to initiate activities. Providing the necessary materials (e.g., a broom, a toy box, a dustcloth) can help children enjoy and sustain this type of play.

Fingerplays

Songs or chants with simple hand motions are a lot of fun for infants, and develop self-control and working memory as well as language. Infants can learn to copy the movements to a song and, with practice, will remember the sequence. *Eensy Weensy Spider*; *Where is Thumbkin?*; and *Open, Shut Them* are examples, but these fingerplays can be found in many languages and cultures.



Conversations

Simply talking with an infant is a wonderful way to build attention, working memory, and self-control.

■ **With younger infants**, start by following the infant's attention and naming aloud the things holding his or her attention. The infant will likely maintain his or her attention a little longer, practicing actively focusing and sustaining attention.

■ **As infants get older**, pointing out and

talking about interesting objects or events can help them learn to focus their attention on something the adult has identified. As babies learn language, they also develop their memory of what is said, eventually mapping words to objects and actions.

■ **Conversations in any language** besides English are also helpful. It has been found that bilingual children of many ages have better executive function skills than monolingual children, so experience using an additional language is an important skill.

Resources

Songs and games

- www.piercecountylibrary.org/files/library/wigglegsticklesall.pdf
- www.turben.com/media-library/8702756_infanttoddlerplaybook.pdf
- www.zerotothree.org/child-development/grandparents/play-o-12-mths-final.pdf

Executive Function Activities for 18- to 36-month-olds

During this stage of development, children are rapidly expanding their language skills. Language plays an important role in the development of executive function and self-regulation (EF/SR), as it helps children identify their thoughts and actions, reflect on them, and make plans that they hold in mind and use. Language also helps children understand and follow increasingly complex rules—both those that regulate behavior and those that apply to simple games. Additionally, bilingualism is associated with better EF/SR, so parents who are fluent in more than one language should use those languages with their children.



Active games

At this age, toddlers are actively developing many important physical skills, and they love physical challenges. The following activities require toddlers to focus and sustain their attention on a goal, inhibit unnecessary and ineffective actions, and try things in new ways if a first attempt fails. They may not always succeed, but the practice is very important. This is a learning process. Many of these activities will require frequent reminders from adult organizers, and they may not last very long!

- **Provide many materials and opportunities** to try new skills, such as throwing and catching balls, walking a balance beam, running up and down an incline, jumping, etc. Set up simple rules to follow for added working memory and inhibition challenges—for example, take turns running to a “finish line” and back.

- **Older toddlers can enjoy simple imitation games**, such as *Follow the Leader*, or song games like *Punchinella* or *Follow, Follow* (“Follow, follow, follow [child’s name], follow, follow, follow [child’s name]”—all children imitate [child]). These are great tests of working memory as well as attention and inhibition.

- **Games that require active inhibition** can be fun, too, like *freeze dance (musical statues)*, although don’t expect children to “freeze” without a few reminders. Also effective are

song games that require children to start and stop, or slow down and speed up, such as *Jack in the Box*; *Popcorn*; *Ring Around the Rosie*; or *Motorboat, Motorboat*.

- **Song games with many movements** are also fun. Examples include *The Hokey Pokey*; *Teddy Bear*; *I’m a Little Teapot*; or *Head, Shoulders, Knees, and Toes*. These require children to attend to the song’s words and hold them in working memory, using the song to guide their actions.

- **Fingerplays, or songs and rhymes with hand gestures** to match, continue to be popular with children this age, similarly challenging children’s attention, working memory, and inhibitory control.



Conversation and storytelling

As children develop more spoken language skills, they can begin to engage actively in conversation with adults and tell simple stories.

- **Simply watching and narrating their play** can be a great way to help very young children understand how language can describe their actions. As children get older, questions can be added, such as “What will you do next?” or “I see you want to put the ball inside the jar. Is there another way to do that?” These comments help children pause to reflect on what they are trying to do, how what they have tried has worked, and how to plan their next move.
- **Telling stories about shared events** can be a great way to reflect on these experiences. The

experience must be held in working memory while the child considers the order in which things happened, why things happened the way they did, and what the experience meant. These stories can also be written or drawn into simple books and revisited.

- **Talking about feelings** is also important, either by labeling children’s feelings as they are noticed (“It looks like you are really angry right now”) or by telling the story of a time a child became upset. By giving children language to reflect on their feelings, these conversations can support the development of emotional regulation, which is essential for engaging executive function.

Matching/sorting games

Children this age are able to play simple matching and sorting games, which require children to understand the rule that organizes the activity (sorting by shape, color, size, etc.), hold the rule in mind, and follow it.

- **Ask children to play a sorting game** in which you take turns sorting objects by size, shape, or color.
- **Engage older toddlers in a silly sorting game**, such as putting small shapes in a big bucket and big shapes in a small bucket.

Children tend to put like with like, so a change is challenging, requiring them to inhibit the expected action and engage their selective attention and working memory.

- **As they get older, toddlers also start to enjoy simple puzzles**, which require attention to shapes and colors. Adults can ask children to think about what shape or color they need, where they might put a certain piece, or where they might put the piece if it doesn’t fit, thereby exercising the child’s reflection and planning skills.

Imaginary play

Toddlers are beginning to develop the capacity for simple imaginary play. Often, toddlers imitate adult actions using objects that they have available (such as sweeping with a broom or pretending to cook with a pot). When they reach this age, these actions are not simply imitative, but can be sustained and show signs of simple imaginary play plots. For example, after “cooking” in the pot, the child will put the pot on the table and pretend to eat.

- **Ask children questions** about what they are doing. Narrate the things you see happening.
- **Play along with the child**, and let the child direct the play. Give the child a chance to tell you what role you should play and how you should do it. Regulating the behavior of others is an important way that children develop their own self-regulation skills.
- **Provide a variety** of familiar household objects, toys, and clothing items to encourage children’s imaginary play.

Resources

Music

- fun.familyeducation.com/toddler/music/37371.html

Other activities

- www.zerotothree.org/child-development/grandparents/play-12-24-final.pdf

- www.zerotothree.org/child-development/grandparents/play-24-36-final.pdf

Pretend play suggestions

- www.mindinthemaking.org/wp-content/uploads/2014/10/PFL-playing-with-household-items.pdf

Executive Function Activities for 3- to 5-year-olds

Children’s executive function and self-regulation skills grow at a fast pace during this period, so it is important to adapt activities to match the skills of each child. Younger children need a lot of support in learning rules and structures, while older children can be more independent. Ultimately, the goal is to shift children away from relying on adult regulation, so when the child seems ready, try to reduce the support you provide.



Imaginary play

During intentional imaginary play, children develop rules to guide their actions in playing roles. They also hold complex ideas in mind and shape their actions to follow these rules, inhibiting impulses or actions that don’t fit the “role.” Players often take ideas from their own lives, such as going to the doctor’s office. They might act “sick,” be examined by the doctor, and receive a shot. The “doctor” talks and acts like a doctor (calm and reassuring), the “sick child” talks and acts like a sick child (sad and scared), and the child in the role of “parent” talks and acts like a concerned parent (worried and caring). While younger children tend to play alone or in parallel, children in this age range are learning to play cooperatively and often regulate each other’s behavior—an important step in developing self-regulation.

Ways to support high-level imaginary play:

■ **Read books, go on field trips, and use videos** to make sure that children know enough about the scenario and roles to support pretend play.

■ **Provide a varied set of props and toys** to encourage this type of play. Younger preschoolers may need more realistic props to get the play started (e.g., toy medical kits), while

older children can re-purpose other things to turn them into play props (e.g., paper towel tube that is used as a cast for a “broken arm”). Reusing familiar objects in a new way also practices cognitive flexibility.

■ **Allow children to make their own play props.** Children must determine what is needed, hold this information in mind, and then follow through without getting distracted. They also exercise selective attention, working memory, and planning. If the original plans don’t work out, children need to adjust their ideas and try again, challenging their cognitive flexibility.

■ **Play plans can be a good way to organize play,** as shown by one early education program designed to build self-regulation, Tools of the Mind. Children decide who they are going to be and what they are going to do before they start playing, and then draw their plan on paper. Planning means that children think first and then act, thus practicing inhibitory control. Planning play in a group also encourages children to plan together, hold these plans in mind, and apply them during the activity. It encourages social problem solving, as well as oral language.

Storytelling

Children love to tell stories. Their early stories tend to be a series of events, each one related to the one before, but lacking any larger structure. With practice, children develop more complex and organized plots. As the complexity of the storytelling grows, children practice holding and manipulating information in working memory.

Ways to support children’s storytelling:

■ **Encourage children to tell you stories,** and write them down to read with the child. Children can also make pictures and create their own books. Revisiting the story, either by reviewing pictures or words, supports more intentional organization and greater elaboration.

continued

■ **Tell group stories.** One child starts the story, and each person in the group adds something to it. Children need to pay attention to each other, reflect on possible plot twists, and tailor their additions to fit the plot, thereby challenging their attention, working memory, and self-control.

■ **Have children act out stories** they have written. The story provides a structure that guides

children’s actions and requires them to attend to the story and follow it, while inhibiting their impulse to create a new plot.

■ **Bilingual families can tell stories in their home language.** Research indicates that bilingualism can benefit a variety of executive function skills in children of all ages, so fostering fluency in a second language is valuable.

Movement challenges: songs and games

The demands of songs and movement games support executive function because children have to move to a specific rhythm and synchronize words to actions and the music. All of these tasks contribute to inhibitory control and working memory. It is important that these songs and games become increasingly complex to interest and challenge children as they develop more self-regulation skills.

■ **Provide many opportunities** for children to test themselves physically through access to materials such as climbing structures, balance beams, seesaws, etc. Setting challenges for children—such as obstacle courses and games that encourage complex motions (skipping, balancing, etc.)—can also be fun. When children are trying new and difficult activities, they need to focus attention, monitor and adjust their actions, and persist to achieve a goal.

■ **Encourage attention control through quieter activities** that require children to reduce stimu-

lation and focus attention—such as using a balance beam or yoga poses that include slow breathing.

■ **Play some music** and have children dance really fast, then really slowly. *Freeze dance* is also fun, and it can be made more difficult by asking children to freeze in particular positions. (Tools of the Mind uses stick-figure pictures to direct children.) When the music stops, children must inhibit action and shift their attention to the picture to imitate the shape depicted.

■ **Songs that repeat and add on** to earlier sections (either through words or motions) are a great challenge to working memory, such as the motions to *She’ll Be Coming ’Round the Mountain*, the words to *Bought Me a Cat*, and backward-counting songs, such as *Five Green and Speckled Frogs* and songs repeating a long list (the *Alphabet Song*).

■ **Traditional song games**, like *Circle ’Round the Zero* are also fun. Complex actions, including finding partners, must be accomplished without becoming distracted.

Quiet games and other activities

■ **Matching and sorting activities** are still fun, but now children can be asked to sort by different rules, promoting cognitive flexibility. Children can first sort or match by one rule (such as by color), and then immediately switch to a new rule (such as by shape). For a more challenging version, play a matching game, but change the rule for each pair. *Quirkle* and *S’Match* are commercially available games that challenge cognitive flexibility in this way. Or play a bingo or lotto game, in which children have to mark a card with the opposite of what is called out

by the leader (e.g., for “day,” putting a chip on a nighttime picture). Children have to inhibit the tendency to mark the picture that matches, while also remembering the game’s rule.

■ **Increasingly complicated puzzles** can engage children this age, exercising their visual working memory and planning skills.

■ **Cooking is also a lot of fun** for young children. They practice inhibition when waiting for instructions, working memory while holding complicated directions in mind, and focused attention when measuring and counting.

Resources

Pretend play suggestions

■ www.mindinthemaking.org/wp-content/uploads/2014/10/PFL-4-year-old-independent-play.pdf

Montessori activities – Walking on the line

■ www.infomontessori.com/practical-life/control-of-movement-walking-on-the-line.htm

Songs

■ kids.niehs.nih.gov/games/songs/childrens/index.htm

Executive Function Activities for 5- to 7-year-olds

Games can exercise children’s executive function and self-regulation skills—and allow them to practice these skills—in different ways. At this age, children start to enjoy games that have rules, but do so with widely varying levels of interest and skill. Since an important aspect of developing these skills is having a constant challenge, it’s important to choose games that are demanding but not too hard for each child. As the child players become familiar with these games, try to decrease the adult role as soon as possible; the challenge is greater for children if they remember and enforce the rules independently. Just be prepared with some techniques for negotiating conflict. Flipping a coin or drawing a straw are some methods used by Tools of the Mind, an early education program designed to build self-regulation.



Card games and board games

■ **Games that require players to remember** the location of particular cards are great at exercising working memory. At the simplest level, there are games such as *Concentration*, in which children uncover cards and have to remember the location of matches. At a more complicated level are games that require tracking types of playing cards as well as remembering their locations, including *Go Fish*, *Old Maid*, *Happy Families*, and *I Doubt It*.

■ **Games in which the child can match** playing cards, either by suit or number, are also good at practicing cognitive flexibility. Examples include *Crazy Eights*, *Uno*, and *Spoons*. *Blink* and *SET* are newer card games in which cards can be matched on more than two dimensions.

■ **Games that require fast responses** and monitoring are also great for challenging attention and inhibition. *Snap* and *Slapjack* are card games that fall into this category. *Perfection* draws on similar skills.

■ **Any board game that involves some strategy** provides important opportunities to make and hold a plan in mind for several moves ahead, consider the varying rules that govern different pieces, and adjust strategy in response to opponents’ moves. Through strategizing, a child’s working memory, inhibitory control, and flexibility have to work together to support plan-based, effective play. *Sorry!*, *Battleship*, *Parcheesi*, *mancala*, *checkers*, and *Chinese checkers* are some of the many examples of these types of games for children this age.

Physical activities/games

■ **Games that require attention** and quick responses help children practice attention and inhibition. They include *freeze dance* (*musical statues*); *musical chairs*; *Red Light, Green Light*; or *Duck, Duck, Goose* for younger children. Some of these games also require the person

who is “It” to mentally track others’ movements, challenging working memory as well; these games include *Mother May I?* and *What Time Is It, Mr. Fox?* Others require selective responses and test inhibition, such as the *Magic Word Game*, in which children wait for a “magic word” to start an action.

continued

■ **Fast-moving ball games**, such as *four square*, *dodgeball*, and *tetherball*, require constant monitoring, rule following, quick decision-making, and self-control.

■ **Simon Says is another great game** for attention, inhibition, and cognitive flexibility, as the child has to track which rule to apply and switch actions, as appropriate. Other versions are the Australian *Do This, Do That* or the variation, *Do As I Say (Not As I Do)*.

■ **Children are now old enough** to enjoy structured physical activities, such as organized sports. Games that require coordination and provide aerobic exercise, such as soccer, have been shown to support better attention skills. Physical activities that combine mindfulness and movement, such as yoga and Tae Kwon Do, also help children develop their ability to focus attention and control actions.

Movement/song games

■ **Copy games**, in which the person imitating has to hold in mind the model's actions, draw on working memory. *Punchinella* is one example, with the model watching during the second verse ("I can do it, too"). Call-and-response songs provide a similar auditory challenge, like *Boom Chicka Boom* and *I Met a Bear*.

■ **Songs that repeat** and add on to earlier sections (either through words or motions) also challenge working memory, like the motions to *She'll Be Coming 'Round the Mountain*, or the words to *Bought Me a Cat*. The classic memory

games of *Packing for a Picnic* or *Packing a Suitcase for Grandma's* fall in this category, too. Older children can enjoy the added challenge of alphabetizing the list.

■ **Singing in rounds** is a challenge for older children that requires use of working memory and inhibition. *Row, Row, Row Your Boat* is a simple round to start with, but there are many with greater complexity.

■ **Complicated clapping rhythms** also practice working memory, inhibition, and cognitive flexibility, and have been popular with generations of children in many cultures. *Miss Mary Mack* and *Down Down Baby* are familiar examples.

Quiet activities requiring strategy and reflection

■ **Children become increasingly independent** at this age, and puzzle and brain teaser books that include mazes, simple word finds, matching games, etc., exercise attention and problem-solving skills (requiring working memory and cognitive flexibility).

■ **Logic and reasoning games**, in which rules about what is possible need to be applied to solve puzzles, start to become interesting and provide great working memory and cognitive flexibility challenges. ThinkFun, a game and puzzle company, provides some appealing and age-appropriate versions with *Traffic Jam* and *Chocolate Fix*, while *Mastermind* is another

old favorite that now has a simpler version for younger children. Educational online game sites provide many similar activities as well.

■ **Guessing games** are also popular and require players to use working memory and flexible thinking to hold in mind previous responses while they develop and discard potential theories. Some examples are *20 Questions* or *Guess My Rule* (often played with blocks of different colors, sizes, and shapes, so that children try to guess which attribute, or set of attributes, defines the rule for the set).

■ **I Spy and the books derived from this game** require children to think about categorization and use selective attention in searching for the correct type of object.

Resources

Online games

- www.coolmath.com
- pbskids.org/lab/games

Game rules

- www.pagat.com
- en.wikipedia.org/wiki/List_of_traditional_children%27s_games

Fun songs

- www.scoutsongs.com

ThinkFun

- www.thinkfun.com

Tools of the Mind

- www.toolsofthemind.org

Helping your child manage social play

- mindinthemaking.org/wp-content/uploads/2015/03/PFL-stubborn-play-schoolage.pdf

Executive Function Activities for 7- to 12-year-olds

These games provide challenges and practice for executive function and self-regulation skills among school-age children. For children in this age range, it is important to steadily increase the complexity of games and activities.

Card games and board games

■ **Card games in which children have to track** playing cards exercise working memory and promote mental flexibility in the service of planning and strategy. *Hearts*, *spades*, and *bridge* are popular examples.

■ **Games that require monitoring and fast responses** are great for challenging attention and quick decision-making in children at this age. *Spit*, for example, requires attending to your own play as well as your opponents' progress.

■ **For younger children, card games requiring matching** by either suit or number continue to test cognitive flexibility. *Rummy* games, including *gin rummy*, are popular examples. Games with more complicated sets of options, such as *poker* and *mahjong*, may challenge older children.

■ **Any game involving strategy** provides important practice with holding complicated moves in mind, planning many moves ahead, and then adjusting plans—both in response to imagined outcomes and the moves of opponents. With practice, children can develop real skill at classic games of strategy like *Go* or *chess*, while challenging working memory and cognitive flexibility. Many more modern strategy games exist as well. Mensa, the high IQ society, holds



a yearly competition testing new games, and provides an interesting list of favorites.

■ **Children this age also enjoy more complex games** involving fantasy play, which require holding in working memory complicated information about places visited in imaginary worlds, rules about how characters and materials can be used, and strategy in attaining self-determined goals. *Minecraft* is a popular computer game of this sort, while *Dungeons & Dragons* is a longtime card-based favorite.

Physical activities/games

■ **Organized sports** become very popular for many children during this period. Developing skill at these games practices children's ability to hold complicated rules and strategies in mind, monitor their own and others' actions, make quick decisions and respond flexibly to play. There is also evidence that high levels of physical activity, particularly activity that requires coordination, like soccer, can improve all aspects of executive function.

■ **Various jump rope games** also become popular among children of this age. Children can become very skilled at *jump rope*, *double Dutch*, *Chinese jump rope*, and other such challenges. Developing skill in these games requires focused practice, as well as the attention control and working memory to recall the words of the chant while attending to the motions.

■ **Games that require constant monitoring** of the environment and fast reaction times also challenge selective attention, monitoring, and

continued

inhibition. For younger children, hiding/tag games, particularly those played in the dark, like *flashlight tag* and *Ghost in the Graveyard*, are fun. Older children may enjoy games like *laser tag* and *paintball*. Many video games also provide practice of these skills, but can include

violent content, so care should be taken in selecting appropriate options and setting reasonable time limits. Common Sense Media, a non-partisan media information organization, provides useful reviews of popular games.

Music, singing, and dance

■ **Learning to play a musical instrument** can test selective attention and self-monitoring. In addition to the physical skill required, this activity challenges working memory to hold the music in mind. There is also some evidence that the practice of two-handed coordination supports better executive function.

■ **Whether or not children learn an instrument, participating in music classes** or community events can still require them to follow rhythmic patterns, particularly when improvisation is involved (e.g., clapping or drumming). This can challenge their coordination of working memory, attention, cognitive flexibility, and inhibition.

■ **Singing in parts and rounds**, as is done in children's singing groups, is also a fun challenge, requiring a similar coordination of working memory, monitoring, and selective attention. As children's musical skills grow,



adults can present them with steadily increasing challenges.

■ **Dancing**, too, provides many opportunities to develop attention, self-monitoring, and working memory, as dancers must hold choreography in mind while coordinating their movements with the music.

Brain teasers

Puzzles that require information to be held and manipulated in working memory can be terrific challenges.

■ **Crossword puzzles** are available for all skill levels and draw on manipulation of letters and words in working memory as well as cognitive flexibility.

■ **Sudoku** provides a similar challenge but

works with numbers and equations rather than letters and words.

■ **Classic spatial puzzles** like *Rubik's Cube* require children to be mentally flexible and consider spatial information in devising potential solutions.

■ **Cogmed and Lumosity** provide computer game puzzles and challenges that are designed to exercise working memory and attention.

Resources

Common Sense Media

- www.common Sense Media.org
- www.common Sense Media.org/game-reviews

List of winning games from American Mensa's Mind Games competitions

- mindgames.us.mensa.org/about/winning-games/

Other programs

- www.cogmed.com
- www.lumosity.com

Tips for using video games

- www.mindinthemaking.org/wp-content/uploads/2014/10/PFL-learning-and-videogames.pdf

Executive Function Activities for Adolescents

During adolescence, executive function skills are not yet at adult levels, but the demands placed on these skills often are. Teenagers need to communicate effectively in multiple contexts, manage their own school and extracurricular assignments, and successfully complete more abstract and complicated projects. Here are some suggestions for helping teens practice better self-regulation throughout the daily challenges they face.

Goal setting, planning and monitoring

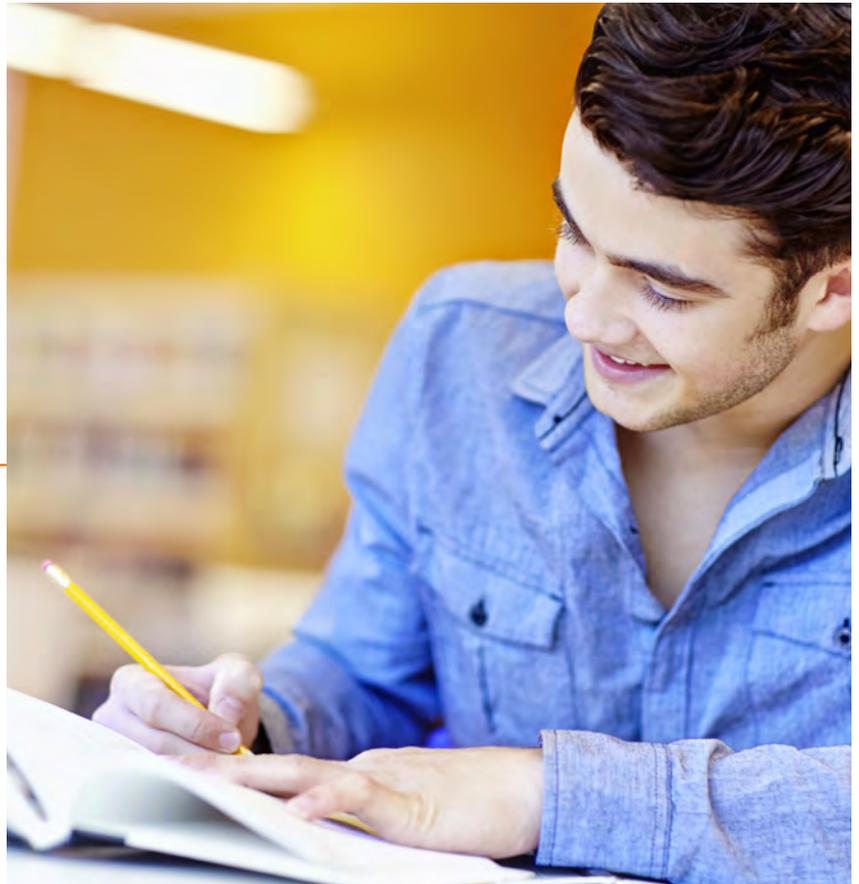
Self-regulation is necessary in any goal-directed activity. Identifying goals, planning, monitoring progress, and adjusting behavior are important skills to practice.

■ **To focus the planning process**, encourage teens to identify something specific that they want to accomplish. Most important is that the goals are meaningful to the teen and not established by others. For some teens, planning the college application process may be self-motivating, but for others, planning a social event may be more important. Start with something fairly simple and achievable, such as getting a driver's license or saving money to buy a computer, before moving on to longer-term goals like buying a car or applying to colleges.

■ **Help teens develop plans** for steps to reach these goals. They should identify short- and long-term goals and think about what has to be done to achieve them. For example: If teens want their team to win the sports championship, what skills do they need to learn? How might they practice them? Identify some problems that might arise, and encourage the teen to plan ahead for them.

Tools for self-monitoring

■ **Self-talk is a powerful way** to bring thoughts and actions into consciousness. Examples include having teenagers talk themselves through the steps of a difficult activity or periodically pausing for a mental play-by-play narrative of what is happening. When occasions



■ **Taking on large social issues**, such as homelessness, domestic violence, or bullying can be both appealing and overwhelming to teens. *DoSomething.org* and *Volunteer-Match.org* can help identify concrete actions.

■ **Remind adolescents to periodically monitor their behavior** and consider whether they are doing the things they planned and whether these plans are achieving the goals they identified. “Is this part of the plan? If not, why am I doing it? Has something changed?” Monitoring in this way can identify counter-productive habitual and impulsive actions and maintain focused attention and conscious control.

arise that provoke strong negative emotions or feelings of failure, self-talk can help adolescents identify potentially problematic thinking and behavior patterns.

■ **Encourage self-talk that focuses on growth.** Help teens recognize that an experience—particularly a failure—can offer lessons, and need

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not be interpreted as a final judgment on one's abilities. For example, when a sports team loses a game, help a discouraged team member to consider what went wrong and what he or she might do to improve next time—rather than simply deciding the team lacks any skills. The same thinking can be helpful for school assignments. Carol S. Dweck, a professor at Stanford University who researches mindsets, has developed a website with more suggestions.

■ **Help adolescents be mindful of interruptions** (particularly from electronic communication such as email and cell phones). Multitasking may feel good, but there is strong evidence that it saps attention and impedes performance. If two (or more) tasks are competing for attention, discuss ways to prioritize and sequence.

■ **Understanding the motivations of others** can be challenging, particularly when people are driven by different perspectives. Encourage teens to identify their hypotheses about others' motivations and then consider alternatives. "Why do you think she bumped into you? Can you think of another explanation?" Teens who are not used to this kind of thinking may need you to model the process: "Could it be that she didn't see you?"

■ **Writing a personal journal** can foster self-reflection by providing teens a means with which to explore thoughts, feelings, actions, beliefs, and decisions. There are many ways to approach journaling, but all encourage self-awareness, reflection, and planning (see websites at end of this section).

Activities

There are many activities that teens may enjoy that draw on a range of self-regulation skills. The key is a focus on continual improvement and increasing challenge. Some examples follow, below:

■ **Sports** — The focused attention and skill development inherent in competitive sports draw on the ability to monitor one's own and others' actions, make quick decisions, and respond flexibly to play. Ongoing, challenging aerobic activity can also improve executive function.

■ **Yoga and meditation** — Activities that support a state of mindfulness, or a nonjudgmental awareness of moment-to-moment experiences, may help teens develop sustained attention, reduce stress, and promote less reactive, more reflective decision-making and behavior.

■ **Music** — Working memory, selective attention, cognitive flexibility, and inhibition are challenged while developing skills in playing a musical instrument, singing, or dancing—particularly when dealing with complicated pieces that involve multiple parts, sophisticated rhythms, and improvisation.

■ **Theater** — A performance is carefully choreographed and requires all participants, on stage and backstage, to remember their jobs, attend to their timing, and manage their behavior. For actors, learning the lines and actions of a role draw heavily on attention and working memory.

■ **Strategy games and logic puzzles** — Classic games like *chess*, as well as computer-based training programs like *Cogmed* and *Lumosity*, exercise aspects of working memory, planning,



and attention. Mensa, the high IQ society, holds a yearly competition testing new games and has an interesting list of strategy games.

■ **Computer games** can also be valuable, as long as time limits are established and observed. Games that require constant monitoring of the environment and fast reaction times challenge selective attention, monitoring, and inhibition. Moving through complicated imaginary worlds, such as those found in many computer games, also challenges working memory. Common Sense Media, a non-partisan media information source, provides some good reviews of popular games.

Study skills

In school, adolescents are expected to be increasingly independent and organized in their work. These expectations can place a large load on all aspects of executive function. Basic organization skills can be very helpful in this regard. The list below can serve as a guide for teens to use.

- **Break a project down** into manageable pieces.
- **Identify reasonable plans** (with timelines) for completing each piece. Be sure that all steps have been explicitly identified and ensure that the completion of each step is recognized and celebrated.
- **Self-monitor while working.** Set a timer to go off periodically as a reminder to check on whether one is paying attention and understanding. When you don't understand, what might be the problem? Are there words you don't know? Do you know what the directions are? Is there someone you can ask for help? Would looking back at your notes help? If you have stopped paying attention, what distracted you? What might you do to refocus? Identify key

times to self-monitor (e.g., before handing in an assignment, when leaving the house, etc.).

- **Be aware of critical times for focused attention.** Multitasking impedes learning. Identify ways to reduce distractions (e.g., turn off electronics, find a quiet room).
- **Use memory supports for organizing tasks.** Mnemonic devices can be powerful tools for remembering information. Developing the habit of writing things down also helps.
- **Keep a calendar** of project deadlines and steps along the way.
- **After completing an assignment,** reflect on what did and did not work well. Develop a list of things that have supported focused and sustained attention as well as good organization, memory and project completion. Think about ways to ensure that these supports are in place for other projects.
- **Think about what was learned** from assignments that were not completed well. Was this due to a lack of information, a need to improve certain skills, bad time management, etc.? What would you do differently next time?

Resources

Journaling with teens – some supports

- extension.missouri.edu/p/GH6150
- www.cedu.niu.edu/~shumow/iit/doc/journal-writing.pdf

Carol S. Dweck's work on mindsets

- mindsetonline.com/changeyourmindset/firststeps/index.html

Common Sense Media

- www.commonsensemedia.org
- www.commonsensemedia.org/game-reviews

List of winning games from American Mensa's Mind Games competitions

- mindgames.us.mensa.org/about/winning-games/

Other programs

- www.cogmed.com
- www.lumosity.com

Stress management suggestions

- www.mindinthemaking.org/wp-content/uploads/2014/10/PFL-school-age-stress-management.pdf

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