



# Executive Function and School Readiness

Resource Paper, November 2012

## What are Executive Functions?

Getting ready to start school is about more than just learning the ABCs. Educators and other experts say that in order to be successful in school, young children need to develop skills in **executive functions**. Executive functions underlie your child's ability to:

- Focus on complicated problems.
- Control impulses.
- Set goals and work toward achieving them.
- Get along with others.

Executive functions serve as the manager of the mind. Some experts have described executive functions as "an air traffic control system at a busy airport to manage the arrivals and departures of dozens of planes on multiple runways."<sup>1</sup>

Teachers rate these qualities as more important than academic skills like knowing the alphabet or being able to count to 20. Experts say that children who lag behind in these executive function skills are less ready to learn traditional academic skills than their classmates. When surveyed about important qualities for school readiness, kindergarten teachers<sup>2</sup> name qualities like:

- Being curious and enthusiastic about learning.

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<sup>1</sup> Center on the Developing Child at Harvard University. (2011). *Building the Brain's "Air Traffic Control" System: How Early Experiences Shape the Development of Executive Function: Working Paper No. 11*. <http://www.developingchild.harvard.edu>

<sup>2</sup> U.S. Department of Education, National Center for Education Statistics. (1993). *Public School Kindergarten Teachers' Views on Readiness for School*.

<http://nces.ed.gov/surveys/frss/publications/93410/index.asp?sectionid=1>

- Using words to communicate needs and wants.
- Being able to follow directions.
- Being able to take turns and to share.
- Being sensitive to other children's feelings.
- Being able to sit still and pay attention.
- Not being disruptive in class.
- Being able to focus and finish tasks.

The development of executive functions begins in infancy, and they continue to mature throughout our lives. According to Ellen Galinsky's recent book, *Mind in the Making*,<sup>3</sup> key executive functions include:

1. Focus and self-control.
2. Taking the perspective of others.
3. Communication.
4. Making connections among things or ideas.
5. Critical thinking (e.g., understanding cause and effect).
6. Taking on challenges.
7. Self-direction and engagement.

## Why Are Executive Functions Important?

Executive functions lay the groundwork for school success. That is why it is so important that young children begin to develop these skills before entering school. Compared with children who show weaker executive functioning, children who start school with strong skills make greater gains in cognitive or academic areas like math or reading.

Children who are behind their peers in these skills show more aggression, have difficulty getting along with others, are disruptive in

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<sup>3</sup> Ellen Galinsky. (2010). *Mind in the Making*. Harper Collins: New York.

class, and are slower to master academic skills in school. Later in life, they may have more difficulty managing friendships or getting and keeping a job.

### **What Does Executive Functioning Look Like in Your Child?**

Your child can do amazingly complex tasks that rely on executive functioning.

Normal childhood games help develop executive functioning. For example, you might remember playing Simon Says. You could obey a direction only if it began with “Simon says.” “Simon says, touch your nose.” “Simon says, pat your head.” “Simon says, sit down.” “Stand up.” You heard an ever-faster stream of directions, and you followed them more and more quickly ... until you realized that you had followed a direction without hearing, “Simon says”! You were managing the competing demands of following the instructions while listening for the key ingredient, “Simon says.” This requires the executive function skills of focus and self-control and managing complicated tasks.

In imaginative play, your child makes up complicated rules, develops characters and long story lines, and negotiates with others about who can participate. This kind of play requires the executive function skills of working memory (remembering information about the characters and rules of the game) and understanding the perspectives of others.

Researcher Walter Mischel demonstrated the long-lasting importance of executive function in an experiment sometimes called the Marshmallow Test.<sup>4</sup> In this study, children were given a choice between getting one marshmallow right away or getting two marshmallows by waiting just a few minutes longer. Children who were able to delay their impulses and wait got a better reward. Follow-up research with the same children showed the connection between executive function and later school success.

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<sup>4</sup> Ibid.

The researcher noted that children who were able to delay gratification were later more likely to have more positive self-esteem and attain a higher education level.

### **Executive Functions and Child Care**

Executive functions are not skills that are learned at a desk with pencil and paper or through flash card drills. Executive functions are learned through repeated experiences where adults gradually guide children toward the development of skills.

A high-quality early child care setting helps children develop executive function – and sets them up for success in school and in later life. As children are more able to show self-direction and self-control, less direction is required from caregivers.

A child care program can support your child’s skills by:

- Maintaining a daily routine with activities at predictable times (e.g., circle time, followed by free play at activity centers, snack, outside play, lunch, nap, etc.).
- Having an orderly environment with defined spaces, storage for toys and activity centers for different types of play.
- Providing opportunity for child-led activities, such as free choice in centers or imaginative play, with flexibility to allow time to complete activities.
- Setting expectations for gradually longer “time on task” as children get older.
- Setting clear rules and expectations for behavior.
- Giving children age-appropriate jobs such as cleaning up, hanging up their own coat, being the line leader or serving their own food.
- Promoting empathy and perspective-taking in resolving conflicts. (“How did Jenny feel when that happened?”)

- Planning games and songs that require turn-taking, memory, sequencing, and stop-and-start, such as Duck-Duck-Goose, Simon Says, Memory, “I’m going on a picnic,” “roll-call” songs, Candyland, etc.
- Involving children in story time discussions about “why?” “what if?” and “what then?”
- Starting and ending the day in a “plan-do-review” routine. Children describe what they will do that day and reflect on their day at the end.
- Supporting learning about how to join an activity that has already started and how to get along by planning activities for small groups (e.g., three children at the sand table, five in the house area).

These are just a few examples of good practices that “scaffold” or support the development of executive function in the daily routines of a child care setting.

### **What Does This Look Like in Practice?**

A scene you can see every day is your child’s caregiver helping children transition from outside playtime to an inside activity. A caregiver using some of the strategies above might:

- Give a five-minute advance warning to children before a play period ends.
- Use a familiar cue such as a song or call-out that children must respond to (“Day-o!”) .
- Have a set routine for lining up and going inside.

With a warning, children can finish a game. They know that soon they will be asked to line up and come inside from recess. They know what behavior is expected (lining up by first come first served, or a certain order) and what will come next (going inside, hanging up coats and washing hands.)

### **Practices That Work Against the Development of Executive Function**

- Large group sizes or high child:staff ratio.
- Disengaged staff or not enough chance for children to interact directly with adults.
- Unpredictable routines or lack of schedule.
- Too many transitions during the day, or not enough time to focus on completing an activity.
- Crowded, chaotic environments.
- Too much screen time (crowding out other, richer, concrete experiences interacting directly with people).
- Overly strict rules or discipline taken to an extreme (too much standing in line, not being allowed to talk at mealtimes, etc.).

### **Professional Development for Teachers Supports Executive Functioning in Children**

A high-quality early childhood program depends on teachers and caregivers who have the education and ongoing training to support the school-readiness of all children. In a high-quality program:

- a) Teachers understand child development and the importance of executive function for school readiness.
- b) They use successful classroom management strategies to promote age-appropriate behaviors and support executive function for children at different stages of development.
- c) They plan daily activities based on the program’s curriculum and the individual needs of children.

A well-prepared teacher has training that includes information about how to recognize and support age-appropriate behaviors and how to recognize and flag children who might have difficulty and need additional screening or supports to succeed. Child

Care Aware® of America supports training for early childhood teachers that includes social, emotional, physical and cognitive development, which are the core areas that make up early childhood development programs.

In many publicly funded pre-K programs, teachers are required to complete early childhood education degrees that include this essential training.<sup>5</sup> Similar requirements are being phased in for teachers in Head Start programs. However, in many states, this training is not a requirement for caregivers in child care settings.

Recent research by Child Care Aware® of America has shown that only 20 states require caregivers in child care centers to have any qualifications in early childhood education beyond a high school degree.<sup>6</sup> Our research has also shown that many states do not have strong requirements for child:staff ratios and group size in licensed centers and family child care homes. We have also found that many states have minimal requirements for structured activities in small family child care homes to support the development of executive function and school readiness.

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<sup>5</sup> Barnett, W.S., Carolan, M.E., Fitzgerald, J., & Squires, J.H. (2011). *The State of Preschool 2011: State Preschool Yearbook*. New Brunswick, NJ: National Institute for Early Education Research. <http://nieer.org/yearbook>

<sup>6</sup> National Association of Child Care Resource & Referral Agencies (2011). *We Can Do Better: 2011 Update. NACCRRRA's Ranking of State Child Care Center Regulations and Oversight*. <http://www.naccrra.org/publications/naccrra-publications/2011/9/we-can-do-better-2011-update-naccrra%E2%80%99s-ranking-of-state-chi>

## About Child Care Aware® of America

Child Care Aware® of America is the nation's leading voice for child care. We work with more than 600 state and local Child Care Resource and Referral agencies nationwide to help ensure that all families in the United States have access to quality, affordable child care. To achieve our mission, we lead projects that increase the quality and availability of child care, offer comprehensive training to child care professionals, undertake groundbreaking research and advocate child care policies that positively impact the lives of children and families. To learn more about Child Care Aware® of America and how you can join us in ensuring access to quality child care for all families, visit [www.usa.childcareaware.org](http://www.usa.childcareaware.org).

## Conclusion

Executive functions help us manage complex tasks, plan our actions and get along with others. They set the stage for school readiness and are a key part of development in the early years and beyond. A high-quality child care program can support children's development of these important skills. Child Care Aware® of America is encouraging parents to look for a high-quality program with well-trained teachers who are ready to promote the development of executive function for young children.

## Additional Resources

- Child Care Aware®, *Resources for Parents and Guardians Choosing Care*, <http://childcareaware.org/parents-and-guardians>
- Center on the Social and Emotional Foundations of Early Learning, <http://csefel.vanderbilt.edu/>
- Center on the Developing Child, Harvard University, <http://developingchild.harvard.edu/>
- Learn the Signs, Act Early, [www.cdc.gov/ncbddd/autism/actearly/](http://www.cdc.gov/ncbddd/autism/actearly/)
- National Center for Learning Disabilities, <http://www.nclld.org/types-learning-disabilities/executive-function-disorders>