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INTRODUCTION

This FreeBook brings together a selection of chapters from Guilford Press and Routledge books dedicated to the development of executive function skills in children. This collection is a valuable resource for parents and therapists alike and covers diverse topics within the field: from supporting executive function development in babies and guiding schoolchildren through their development, to helping your teenager with executive function difficulties and looking at why such difficulties exist.

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CHAPTER 1: BUILDING A CONNECTION BETWEEN HOME AND SCHOOL

Are you sick of nagging your child to write down homework assignments? Is his or her backpack a black hole that eats up papers, books, and gym clothes? Organizational skills problems aren’t just frustrating—they get in the way of school success and wreak havoc at home. The Organized Child is a unique resource based on a scientifically tested program that shows how you can teach your child to develop important skills.

In this chapter Richard Gallagher, Elana G. Spira, and Jennifer L. Rosenblatt explore the importance of identifying a “point person” at your child’s school who can help support your child’s organizational skills.

“[I]t’s important for teachers and other involved staff members to understand the challenges your child is facing and your plan for addressing them. The key issues you want them to understand are that your child struggles to learn organizational skills that are easier for many kids to develop [in other words, she is not just lazy], and that you are working with her on developing these skills in a step-by-step fashion. A teacher who understands that a child is working on writing down assignments and will get to time management later is more likely to notice positive changes in assignment tracking, rather than just focusing on a late assignment.”
INTRODUCTION

CHAPTER 2: LANGUAGE, WORDS AND SYMBOLS

*Nurturing Natures*, provides an indispensable synthesis of the latest scientific knowledge about children’s emotional development. Integrating a wealth of both up-to-date and classical research from areas such as attachment theory, neuroscience, developmental psychology and cross-cultural studies, it weaves these into an accessible enjoyable text. Graham Music covers how children develop language understanding and communication and the challenges brought by developmental disorders, as well as highlighting the impact of background on development.

“What distinguishes human language from the rudimentary copycat words that parrots can use, or the alarm calls that monkeys make, is such psychological understanding. Language use is not just about signs, that one word ‘stands for’ a thing. It requires the ability to ‘tune in’ to another’s mind, to make sense of their intentions.”

CHAPTER 3: EPIGENETICS: THE END OF THE NATURE-VERSUS-NURTURE DEBATE


“Epigenetic change is to DNA as control dials are to the electronic circuits on your car stereo. The stereo plays something very different when you change the bass–treble ratio, change the volume, or even change the station. After you change the settings, the new volume stays that way until you change the dial again. Yet the underlying electronics have not changed.”

CHAPTER 4: THE DEVELOPMENT OF COGNITIVE SKILLS

*Understanding Child Development* introduces the main areas of developmental psychology in childhood. It covers both classic and contemporary theories and research, while also examining child development in real-world settings. Sara Meadows outlines in this chapter what we know about the development of specific cognitive skills - perception, executive functions, attention, memory, metacognition.
and social cognition – and draw some conclusions about the developmental processes involved and how they can be facilitated.

“Being able to be attentive on demand is an essential skill for success in relationships and social settings. Being able to distract oneself from an emotional difficulty or an insoluble problem may contribute to one’s emotional wellbeing and mental health. All of these attentional skills have roots in infancy and become better with practice and brain maturation.”

CHAPTER 5: LINKING ASSESSMENT TO INTERVENTION

Executive Skills in Children and Adolescents, 3rd Edition presents effective ways to assess students’ strengths and weaknesses, create supportive instructional environments, and promote specific skills, such as organization, time management, sustained attention, and emotional control. Strategies for individualized and classwide intervention are illustrated with vivid examples and sample scripts. In this chapter Peg Dawson and Richard Guare look at a number of interventions designed to address specific problems and a case example to illustrate the process.

“The goal of assessment is intervention. To meet this goal, the assessment process is designed to gather behavioral information relevant to intervention. It is not enough, however, to be able to describe the behaviors of concern to design an effective intervention. We must also have some understanding of why the behavior occurs.”

CHAPTER 6: PSYCHOLOGY

In The Science inside the Child Sara Meadows presents some of the ways in which science can describe and explain how and why children develop in the way they do. It looks at children’s individual development within the development of our species, at genes, at the hormone systems that flood our bodies, at the neuroscience of children’s brains, and at patterns of behaviour. It looks, in other words, at the different influences on child development according to the scientific disciplines of evolutionary theory, genetics, epigenetics, endocrinology, neuroscience, epidemiology and psychology. This chapter explores parenting behaviour and how it affects child development.
“‘Developing’ children is analogous to developing a photograph; there’s what the picture is doing as it gains detail and clarity (‘tasks’), and there’s what the photographer is doing to bring about that change (‘frames’).”

CHAPTER 7: ATTENTION, EXECUTIVE FUNCTIONING, AND MOTIVATION PROBLEMS IN TEENS

Parent-Teen Therapy for Executive Function Deficits and ADHD: Building Skills and Motivation is a user-friendly manual presenting an innovative, tested approach to helping teens overcome the frustrating organizational and motivation problems associated with executive function deficits and attention-deficit/hyperactivity disorder (ADHD). The Supporting Teens’ Autonomy Daily (STAND) approach uses motivational interviewing (MI) to engage teens and their parents in building key compensatory skills in organization, time management, and planning.

In this chapter, Margaret Sibley gives a case study example of handling this difficult period and tools for professionals to help parents.

“Most therapists who treat teenagers have met Marcus. He may be a typically developing teen who stumbles with the increasing demands of adolescence. He may have a clinical diagnosis of attention deficit/hyperactivity disorder (ADHD), an autism spectrum disorder (ASD), or another diagnosable neurocognitive deficit. What is clear is that Marcus struggles in a way that significantly affects his daily life. Marcus could benefit from intervention—but which approach would be best for him?”

CHAPTER 8: WHAT CAN MY NEWBORN DO?

What are infants capable of? Sarah Kuppen, expert in early child development, uses her scientific expertise to sort through the hype and give you the facts. Using the latest developmental research, she provides practical tips and solves more than 50 familiar parent questions in Little Kids, Big Dilemmas. In this chapter she covers how newborns first develop skills.

“Babies come pre-programmed for learning, and are very choosy in how they focus their attention. Babies tune into the things that matter and quickly block out those that don’t. They also come
equipped with a wide range of survival skills. Many of these are related to forming social attachments.”

As you read through this FreeBook you will notice that some excerpts reference previous or further chapters. Please note that these are references to the original text and not the FreeBook.
READ THE LATEST CHAPTERS ON EXECUTIVE FUNCTION WITH THESE KEY TITLES

- Understanding CHILD DEVELOPMENT
- Nurturing Natures
- The Science Inside the Child
- Parent–Teen Therapy for Executive Function Deficits and ADHD
- Getting Ahead of ADHD
- The Organized Child

GET 20% OFF THESE TITLES WHEN YOU ORDER ONLINE. SIMPLY ENTER THE DISCOUNT CODE EXF20 AT CHECKOUT.
BUILDING A CONNECTION BETWEEN HOME AND SCHOOL

Richard Gallagher, Elana G. Spira and Jennifer L. Rosenblatt

In this chapter, you will learn how to:

• Identify a “point person” at your child’s school (your child’s teacher or a support staff member) who can help support your child’s use of organizational skills.

• Conduct an initial meeting with this person.

IDENTIFYING A SINGLE “POINT PERSON” AT THE SCHOOL

If you want your child to integrate new organizational skills and routines into his everyday life, you will need to enlist support and involvement from teachers and other key support staff at his school. It’s helpful to identify a single “point person” at the school with whom you can communicate while working on this program. The appropriate person to fill this role differs, depending on the school context. In elementary school, often, it is simplest to work directly with the child’s classroom teacher. Beyond elementary school, when a child has many teachers, the situation is usually more complicated. It’s often useful to start at the top (with the principal or headmaster), explain the type of help you need (by the end of this chapter, you’ll have a good sense of the assistance required), and ask for advice regarding who might be the most useful partner in this endeavor. Possible contacts include a school psychologist, guidance counselor, or advisor; a staff member from student support services; the lead teacher of a teaching team; or a learning specialist.

If the child is assigned a paraprofessional (a teaching assistant whose role is to provide additional instructional and/or behavioral support) or aide, this can be a useful person to bring into the fold as you work on this program. Be clear about the skills that you plan to help your child develop, and describe exactly how you would like the paraprofessional to help. Explain that you would like to work together to find ways that the paraprofessional can support your child in learning those skills. In particular, you can request that the person prompt and praise your child, rather than doing tasks for the child. For example, you may ask the paraprofessional to prompt your child to write the assignments on the planner, and then initial these to indicate that they were recorded correctly, rather than writing down the assignments for your child.
WHY TEACHERS/SCHOOL PERSONNEL ARE ESSENTIAL

UNDERSTANDING AND SUPPORT

First, it’s important for teachers and other involved staff members to understand the challenges your child is facing and your plan for addressing them. The key issues you want them to understand are that your child struggles to learn organizational skills that are easier for many kids to develop (in other words, she is not just lazy), and that you are working with her on developing these skills in a step-by-step fashion. A teacher who understands that a child is working on writing down assignments and will get to time management later is more likely to notice positive changes in assignment tracking, rather than just focusing on a late assignment. The teacher will also be more likely to praise positive steps that the child takes toward getting organized, as opposed to criticizing failures to meet larger organizational demands.

PROMPTS AT SCHOOL

Second, as we’ve discussed in Chapter 5, your child will require frequent prompting when he is first learning a new organizational skill, before that skill becomes part of an established routine. We’ve found that children are more likely to master skills when teachers and other staffers know which new skills children are working on and prompt them to perform those skills at appropriate times. For example, the first new skill that we introduce to children is the use of a Daily Assignment Record (DAR), where the child must write down assignments, materials needed, and due dates. (The DAR is described in full in Chapter 7.)

Third grader Juan had a teacher who was excited about the OST program and enthusiastic about the value of the DAR. Each day she prompted Juan to turn to a blank DAR page and write down the assignments and materials needed. She then reviewed the list for accuracy, and she gave Juan a check mark on his DAR if he had recorded everything correctly. Juan quickly learned to use the DAR correctly; he was also proud that he was able to earn points at home for the positive feedback received from his teacher.

In contrast, fourth grader Rebecca consistently came home with partially completed or blank DARs. She was disappointed that she was unable to earn all of her daily points, because her teacher rarely remembered to review or sign her DAR. Rebecca often forgot to fill
out the DAR on her own, and even when she remembered, she was shy about going up to the teacher’s desk and asking for a check mark. It took several months for Rebecca to learn to use the DAR consistently, and she continued to forget materials at school as a result.

To set your child up for success, it’s important to ensure that responsible adults can provide reminders and praise at the time when the skill is needed—especially when your child is just learning to use new, unfamiliar skills or routines.

APPROVAL FOR ORGANIZATIONAL TOOLS

Another reason why teachers/school staffers are vital members of the organizational “team” is that they often need to give approval for new organizational tools or systems. Roger, a sixth grader who struggled with paper management, illustrates how essential this approval can be. Roger often forgot to punch holes in his papers to store them properly in the recommended three-ring binders, and his papers would get shoved into the front pocket of the binder or would be left to float in the bottom of the backpack. After working with an OST therapist, Roger started using an accordion file, which made it much easier for him to file papers correctly. However, a few days after he started using the accordion file, Roger was sent home with a note saying that he needed to use the same system for storing papers as the rest of the students. Because his parents had not cleared this new system with the teacher ahead of time, Roger was given negative feedback for his efforts to organize himself and was back at square one.

We’ve found that teachers vary widely in how explicitly they teach organizational skills or require the use of specific tools/systems. It’s important to approach teachers and other school staff members at the outset and work together to figure out which systems work best for your child and which modifications may be acceptable. In all of Part III (Chapters 7–10), we suggest alternatives to the specific tools and routines that we recommend, with the understanding that some flexibility may be necessary to accommodate the specific demands of the child’s school environment. We believe you’ll find—as we have found—that when parents work hand in hand with teachers, changes to children’s organizational routines are most lasting and beneficial.
BUILDING A CONNECTION BETWEEN HOME AND SCHOOL
Richard Gallagher, Elana G. Spira and Jennifer L. Rosenblatt

HOW TO GET TEACHERS/OTHER STAFF INVOLVED

To set the stage for a coordinated effort that will enhance your child’s organized behavior in school, schedule an initial meeting with the teacher and/or other identified “point person.” (From here on, we’ll refer to this person simply as “the teacher,” for simplicity’s sake.) At this meeting, you will:

1. Learn more from the teacher about your child’s organizational performance in class.
2. Determine what organizational routines/tools the teacher asks the students to use, and how those are working for your child.
3. Determine whether the teacher is willing to work with you to prompt, monitor, and praise your child’s use of new organizational routines/tools.

To accomplish the first goal, you will want to make sure that you focus the meeting on specific questions about your child’s organizational strengths and weaknesses in school. To guide this conversation, you can refer to the behaviors listed on the Teacher’s Organization, Time Management, and Planning (OTMP) Inventory (page 77). (See the end of the Contents for information on downloading and printing additional copies of this form.) You may want to ask the teacher to fill out this inventory before your meeting, so you can then discuss problems that the teacher notes as frequently affecting your child’s performance in school.

To accomplish the second goal, finding out what steps the teacher has already taken to improve your child’s organization in school, you can use the questions in the Teacher Interview form on page 78. (See the end of the Contents for information on downloading and printing extra copies of the form.)

You and the teacher may disagree about your child’s problems with organization. In fact, children often act differently in different settings. For example, some children are moderately organized at school, where organizational routines are built into the schedule, but struggle to get homework done at home, where routines are less structured. Other children might manage organizational demands at home quite well, with one-on-one support from a parent, but fail to keep track of materials or get work done on time in class, without that individualized support. Your goal in this initial meeting is to understand how the teacher perceives your child’s organizational strengths and weaknesses in school, as you want to work together to devise strategies to improve performance in that setting.
# TEACHER’S ORGANIZATION, TIME MANAGEMENT, AND PLANNING (OTMP) INVENTORY

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<thead>
<tr>
<th></th>
<th>Never</th>
<th>Sometimes</th>
<th>Often</th>
<th>Always</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Tracking assignments</strong></td>
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<tr>
<td>The child writes down assignments inconsistently.</td>
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<tr>
<td>The child neglects to hand in assignments on the day they are due.</td>
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<tr>
<td>The child is unprepared for tests.</td>
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<tr>
<td><strong>Managing materials</strong></td>
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<tr>
<td>It is hard for the child to find the papers he/she needs.</td>
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<td></td>
<td></td>
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<tr>
<td>The child forgets important items [e.g., books, notebooks] at home.</td>
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<tr>
<td>The child’s desk is messy.</td>
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</tr>
<tr>
<td>The child’s folders/binders are disorganized.</td>
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</tr>
<tr>
<td><strong>Time management</strong></td>
<td></td>
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<tr>
<td>The child has difficulty getting started with in-class assignments.</td>
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<tr>
<td>The child takes a long time to complete in-class assignments.</td>
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<tr>
<td><strong>Task planning</strong></td>
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<tr>
<td>The child has trouble knowing how to start projects/assignments.</td>
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<tr>
<td>The child has trouble creating a plan for completing tasks [e.g., writing assignments].</td>
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<tr>
<td>The child has difficulty meeting deadlines for long-term assignments.</td>
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<tr>
<td>The child often hands in work that is incomplete and/or messy.</td>
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</tbody>
</table>

From *The Organized Child* by Richard Gallagher, Elana G. Spira, and Jennifer L. Rosenblatt. Copyright © 2018 The Guilford Press. Purchasers of this book can photocopy and/or download enlarged versions of this material [see the box at the end of the table of contents].
# TEACHER INTERVIEW

**Assessing Existing Organizational Routines/Tools**

This form gives a question to ask your child’s teacher for each of four main areas of organization, time management, and planning that many students need support with.

<table>
<thead>
<tr>
<th>KEEPING TRACK OF ASSIGNMENTS</th>
<th>TIME MANAGEMENT</th>
</tr>
</thead>
<tbody>
<tr>
<td>“How do students record assignments (for example, planner, notebook, online)?”</td>
<td>“Do you use specific methods to help students get tasks done on time (for example, timers, clocks)?”</td>
</tr>
<tr>
<td>Current method:</td>
<td>Current method:</td>
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<tr>
<td></td>
<td></td>
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<tr>
<td></td>
<td></td>
</tr>
<tr>
<td>Is this method working for your child?</td>
<td>Is this method working for your child?</td>
</tr>
<tr>
<td>□ Yes □ No</td>
<td>□ Yes □ No</td>
</tr>
<tr>
<td>If no, will the teacher allow your child to use a different method?</td>
<td>If no, will the teacher allow your child to use a different method?</td>
</tr>
<tr>
<td>□ Yes □ No</td>
<td>□ Yes □ No</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>MANAGING MATERIALS</th>
<th>PLANNING</th>
</tr>
</thead>
<tbody>
<tr>
<td>“How do students file and organize papers?”</td>
<td>“Do you break larger projects down into steps for students? If so, how?”</td>
</tr>
<tr>
<td>Current method:</td>
<td>Current method:</td>
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<tr>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td>Is this method working for your child?</td>
<td>Is this method working for your child?</td>
</tr>
<tr>
<td>□ Yes □ No</td>
<td>□ Yes □ No</td>
</tr>
<tr>
<td>If no, will the teacher allow your child to use a different method?</td>
<td>If no, will the teacher allow your child to use a different method?</td>
</tr>
<tr>
<td>□ Yes □ No</td>
<td>□ Yes □ No</td>
</tr>
</tbody>
</table>
Your third task is to enlist the teacher’s active participation in working with you and your child on an organizational program. You may want to share portions of this book with the teacher, including either the child or teen version of the Guide to the Glitches (see Chapter 3), which helps to explain how you will be discussing and approaching organizational difficulties with your child. You may also want to let the teacher know that the principles and techniques you will be using from this book were developed in an intervention called the Organizational Skills Training (OST) program, which has been shown to be effective in research studies.

Explain that you will be working with your child at home on learning key organizational skills and integrating those new skills into a regular routine. You can share portions of Chapter 4 with the teacher, to highlight key areas that you will focus on with your child. We have found that it is most helpful to ask teachers to prompt and praise children for working on two key skills in the classroom: writing down assignments in the DAR, and filing papers appropriately for transfer between school and home (using an accordion file, as discussed in detail in Chapter 8). Ask if the teacher is willing to support the child’s use of these skills in school by prompting, praising, and monitoring these specific target goals. You can also ask the teacher which other organizational routines would be most beneficial to your child in class. You can use this discussion to determine how best to focus your joint work with the child as you start to tackle organizational skills in the school setting.

Specifically, you will be asking the teacher to do these things:

1. **Prompt** the child to perform specific target goals (these will be noted on a copy of the DAR, as discussed below, and will change as treatment progresses).
2. **Praise** the child for performing the target goals.
3. **Provide** the child with a check on the DAR (which translates into a point at home) for performing the target behaviors. The teacher can place a check mark with his initials at the bottom of your child’s DAR page for that day to indicate that the child has met the target goals for the day.

You will then provide home points and rewards to the child, based in part on the teacher’s record of whether or not your child performed the target goals.

When speaking with your child’s teacher, remember how busy a teacher’s day is. What with managing the needs of multiple students, preparing lessons and materials, grading assignments, and dealing with administrative demands, teachers are often working at maximum capacity every minute of the day (and often after the school day).
For that reason, your request to give individual attention to your child, in the midst of a sea of other students who require the teacher’s attention, may be seen as burdensome. Be sensitive to that reality: Make sure you tell the teacher that it should take only a few minutes each day to prompt and praise the child’s performance of target goals and to put a check mark with initials on the DAR. Ask the teacher how you can help make this task less burdensome, by sending reminders, creating forms for documenting the child’s performance, and providing support at home. Furthermore, remember to express your appreciation for your teacher’s willingness to dedicate these precious few minutes to your child. This small investment of time will provide invaluable support to the child, as the child learns and practices new organizational skills.

**THE DAILY ASSIGNMENT RECORD: THE LINK BETWEEN HOME AND SCHOOL**

As mentioned above, the teacher will be able to provide a check for the child on the DAR for each target goal that the child performs in school. When you meet with the teacher, share the DAR form in Chapter 7 (page 95) and the Teacher’s Guide to the DAR handout on the following page [see the end of the Contents for information on downloading and printing copies of this form and this handout]. Request that the teacher follow these steps to reinforce use of the DAR:

1. Prompt the child to fill in the DAR each day.
2. Correct any errors that the child makes.
3. Put a check mark with initials on the page if the child completes the DAR accurately and does not require any corrections.

If the teacher is not comfortable with the idea of the child’s using the DAR to record assignments, and would prefer that the child use the same method of recording assignments as the rest of the class, discuss with the teacher how to make that method work (see Chapter 7). Just be sure to find a spot on the other assignment record where the teacher can record a check mark for successful performance. If your child is uncomfortable getting the teacher’s signature on the DAR or other assignment record because it’s embarrassing to do so in front of classmates, you can figure out a more subtle way to get this done. For example, the teacher can sign the planner in the course of making normal rounds around the class, or your child can arrange to drop by during a free period to get the DAR checked and initialed.
BUILDING A CONNECTION BETWEEN HOME AND SCHOOL

Richard Gallagher, Elana G. Spira and Jennifer L. Rosenblatt

REQUESTING REGULAR FEEDBACK

Once you have enlisted the support of your child’s teacher in working on organizational skills, it’s important to keep communicating regularly. Check with the teacher at regular intervals to see how successfully your child is using the various organizational skills/routines in school. Rather than waiting for quarterly grades to find out how your child is doing in school, you will be able to get immediate feedback that will help you fine-tune your work with your child and assure more continuous improvement. You may want to use a form like the Weekly Teacher Feedback Form shown on the following page, to ensure that you are constantly up to date on your child’s school performance. Beyond elementary school, getting feedback every two weeks is more practical for teachers. [See the end of the Contents for information on printing copies of the form or downloading an electronic version you can e-mail to the teacher.]

TEACHER’S GUIDE TO THE DAILY ASSIGNMENT RECORD (DAR)

Your student has been taught and practiced a new method for writing down school assignments on a form called the Daily Assignment Record, or DAR. The DAR is designed to help students keep track of their assignments and the materials they need to complete those assignments. A copy of the DAR is provided along with this handout, so you can see its basic features:

1. A space to write down homework assignments for each subject.
2. A space to check what items need to go home (e.g., textbooks, notebooks, worksheets).
3. A space to write down any other assignments or tests that are due in the future.

The first target goal will be completing the DAR. Please review your student’s DAR each day, and put a check mark with your initials on the page if it is completed accurately, without your help. If there are errors, you can correct them, but then please do not provide a check mark with your initials.

Please remember the three P’s:

Prompt your student to use the target skill.
Praise the student.
Provide a check mark if the student met the target behavior.

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BUILDING A CONNECTION BETWEEN HOME AND SCHOOL
Richard Gallagher, Elana G. Spira and Jennifer L. Rosenblatt

Excerpted from The Organized Child

CHAPTER 1

ESTABLISHING FORMAL ASSISTANCE

If your child’s organizational difficulties are related to a diagnosed condition, such as attention-deficit/hyperactivity disorder (ADHD) or a learning disorder, it might be appropriate to use what is known as a “Section 504 plan” to facilitate teacher involvement in working with your child. Many children with ADHD have such plans, which recognize their status as children with an impairing condition, usually designated in the category of “other health impairment.” Such a plan provides for teaching accommodations, usually including extended time on tests, preferential seating, and the use of daily behavior report cards. If your child already has a Section 504 plan, you could suggest adding another accommodation to the established plan, relating to organizational skills development. The new accommodation could provide for daily teacher supervision of the use of organizational tools and routines, to include a few minutes’ time to prompt and praise the child’s use of such tools and routines. If your child does not have a Section 504 plan and you believe that one would be appropriate, speak with the school psychologist to initiate the process of establishing a plan, and to suggest the inclusion of a teacher accommodation related to support for organizational skills acquisition. With such an official plan in place, the teacher might feel more comfortable with providing the needed assistance. It should be noted that while public schools are legally bound to provide the accommodations listed on a 504 plan, private schools are not under similar obligations.

Some other students are designated as in need of special education support. For such a student, school supports are developed and listed in an individualized education program (IEP). Issues with OTMP skills are concerns for many children with IEPs. If your child already has an IEP, you can petition to have specific goals and specific teacher support provided for building OTMP skills. We recommend that you discuss this with your child’s IEP chair. In our experience, a variety of school professionals have been involved in providing OTMP support to students, including learning disability specialists, school psychologists, guidance counselors, and occupational therapists.

TROUBLESHOOTING TIP!

Working flexibly with the school

Even if parents follow all the steps suggested in this chapter to encourage school involvement in their work with their children on organization, teachers are likely to vary in their level of participation. If your child’s teacher is either unable to provide help in the manner we have outlined, or agrees to help but fails to follow through, discuss the situation with the teacher to find out if there is anything you can do to make it easier for the teacher to participate. If daily monitoring simply is not realistic for your child’s teacher, you may want to consider modifying the in-school recording of skill use. It may be possible for a teacher to provide a weekly report on your child’s use of skills, rather than daily reports. Or, if the teacher cannot be relied on to record behavior, it may be necessary instead for you to evaluate your child’s in-school performance yourself by asking your child to show evidence that the skill has been used. Your child’s correct recording of assignments, for example, could be verified by checking against an online homework listing.

In our work with children and families, we have found that children benefit greatly from active cooperation between parents and school staff when they are working on mastering new skills and behaviors. However, don’t be discouraged if your child’s teacher does not fully participate in this program, or if you can’t find another member of the staff who is willing to implement the OST system in the school and to serve as your contact for your child. If you are consistent in working with your child at home, and in reinforcing the steps that your child takes to remain organized in and out of the classroom, your child will show improvement.
# WEEKLY TEACHER FEEDBACK FORM

Please complete this form for the week starting Monday, ________________________________

Please e-mail at the end of the week to: _____________________________________________

Student: ________________________________  Teacher: ________________________________

1. Please check if the student turned in his/her homework for your class on the following days:

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2. Did the student complete all in-class assignments in your class this week?

☐ Yes  ☐ No

If no, which of the following situations apply?

☐ Student did not bring materials necessary to complete assignments.

☐ Student was off task during classwork time.

3. Anything else I should know?

______________________________________________________________________________

______________________________________________________________________________

______________________________________________________________________________

______________________________________________________________________________

______________________________________________________________________________

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BUILDING A CONNECTION BETWEEN HOME AND SCHOOL
Richard Gallagher, Elana G. Spira and Jennifer L. Rosenblatt

MOVING FORWARD
You now have the foundation you need to start working with your child on the OST program. Do you feel confident that you’re prepared?

OST PREPARATION CHECKLIST

☐ I have a good understanding of what to expect in Parts III and IV.

☐ I’ve talked to my child about what we’ll be doing, so she feels enthusiastic that the program will help her succeed at school and at home, and she doesn’t feel blamed for her organizational problems.

☐ I understand how to use the Home Behavior Record [HBR].

☐ I understand the role of prompting, monitoring, praising, and rewarding my child, and I am committed to using these strategies with him.

☐ I’ve talked to my child’s teacher[s] [and/or other school personnel] and gotten a commitment to help with the OST program.

☐ I plan to read through the whole book, to get a more comprehensive understanding of what we’ll be working on, before I start to dive into teaching my child individual skills.
CHAPTER 2

LANGUAGE, WORDS AND SYMBOLS
Sophisticated language use is unique to humans. Other primates and animals produce sound patterns, monkeys can warn of predators, birds sing in complex ways, but none match human language. Attempts at teaching chimps to speak have met with limited success; they have been taught up to 100 signs, and even to joke and lie, but they never really develop syntax or sentences (Yule, 2014).

Considering humans probably diverged from Great Apes some 6,000,000 years ago, we gained language relatively recently, probably about 70,000 years ago. This was roughly when humans expanded into new territories, developed cultural capacities such as cave painting, and were becoming the last surviving hominid, with the demise of the Neanderthal. Most evolutionary theories suggest that humans achieved their success at least partly through social solidarity and communication skills. Dunbar (2011), from an evolutionary perspective, has argued that language helped ensure group unity when human group sizes increased so much that the mechanisms for ensuring group cohesion seen in other primates, like physical grooming, no longer worked. Evolutionary psychologists suggest that language allowed social conventions and information to be stored in group consciousness, maybe via chants, songs and stories, allowing humans to transmit culture and, for example, pass on information across generations, such as about plant species, hunting skills and seasonal changes, as well as cultural and religious conventions.

In much Western thought, dominated by rationalism, the logical and cognitive content of words has been privileged. Language was viewed as a way of communicating ideas from one person to another, ideas conceptualised as discrete entities passed from mind to mind rather on the model of a telegraph. This leaves out how speech is an emotional, bodily and sensuous process, and a feeling-full expressive act.

For most of psychology’s history language has been considered in terms of cognitive capacities, with words primarily seen as developing scaffolding for thinking. This sat comfortably with an ethos that saw emotion and affect as relatively poor cousins to cognition. In this chapter I stress social, emotional and cultural aspects of language, how linguistic abilities are being laid down in infancy, and are linked to early emotional and gestural communication, as well as the understanding of other minds.

A relationship with language is even developing in utero, and infants start to recognise sounds in their first months. By about nine months infants generally begin to understand the meaning of some words, and just before a year first words often
appear. Between about 12 and 20 months vocabulary grows, and by the end of their second year many infants can use between 20 and 50 words, some in combination. Through the next year the rudiments of grammar are learnt, leading sometimes to the quaintly overzealous application of rules in statements like ‘he fallded over’ or ‘she winned the race’. More complex capacities for stories and communication tend to form after five years of age. Such milestones are only the roughest of guides, some children reach them earlier, others later, and sadly some might never do.

The world is never the same after we acquire language. Words can determine how we see and understand the world, altering one’s perspective, as Eva Hoffman (1990, p.29) describes in her autobiographical account, *Lost in Translation*, where she writes ‘Sometimes, when I find a new expression, I roll it on the tongue, as if shaping it in my mouth gave birth to a new shape in the world’. Language can open up new vistas, as poetry often does, and it is necessary for developing the autobiographical and narrative capacities that are central to forming a coherent sense of self. Yet language can be a loss as well as a gain, as Daniel Stern (1985, p.176) shows. He describes a child perceiving a patch of yellow sunlight on a wall, ‘experiencing the intensity, shape, brightness, pleasure’, having what is a global sensory experience which can be disrupted forever when someone says something like ‘look at the yellow sunlight’. Putting experiences into verbal categories (e.g., yellow sunlight) inevitably reduces the complexity of experience, depleting what *Mindfulness* theorists [e.g. Williams and Penman 2011] call ‘beginners’ mind’. Stern says that language can ‘fracture amodal global experience’ so that one becomes distanced from it.

Some argue that people are ‘prisoners’ of their language, unable ever to think outside its confines. Others such as Pinker (2002) suggest that thoughts and thinking occur independently of the ability to use language. Indeed some neuroscientists such as Damasio (1999) suggest that thinking is occurring most of the time, irrespective of language. We can distinguish language and thought, and also language and communication, even though they are linked. Infants are biologically primed to communicate, and their early communications contain emotional understanding, intentionality and expectations. This differs from a traditional view of communication as one person ‘sending’ a ‘parcel’ of information to another, with an understanding that the other can receive and understand this parcel. An infant’s urgent vocalisation is a kind of proto-communication, which a mother might respond to in a way that makes it meaningful, communicating back this understanding so that the baby learns to make sense of their own feelings, as described in the psychoanalyst Bion’s (1977) theory of containment. In this way meanings are socially constructed through dialogic interaction.
CENTRAL TO LANGUAGE IS SYMBOLISM. WORDS ARE ARBITRARY, AND ALTERNATIVE RANDOM SOUNDS COULD JUST AS EASILY BE USED TO DENOTE THE SAME THINGS. FOR EXAMPLE, WHILE WE USE ‘PAPER’ TO DENOTE THAT THING THAT WORDS ARE PRINTED ON, IT WOULD BE EQUALLY POSSIBLE FOR ANOTHER SYMBOL TO DO THE SAME JOB. WITH THE EXCEPTION OF ONOMATOPOEIC OR ICONIC WORDS, SUCH AS ‘BANG’ OR ‘WOOF WOOF’, IN LINGUISTIC SYMBOLS A PSYCHIC SPACE IS OPEN BETWEEN THE WORD AND THAT WHICH IT DESCRIBES. THIS ALLOWS A PSYCHOLOGICAL SPACE BETWEEN THE LANGUAGE, THE SYMBOL ITSELF AND THE THING BEING DESCRIBED. WHEN WE LABEL SOMETHING WITH A SYMBOL THIS INCREASES OUR CAPACITY FOR SELF-REFLECTION, AS THE SYMBOL AND THAT WHICH IS SYMBOLISED CAN BE REFLECTED UPON AND SPOKEN ABOUT, INCREASING COGNITIVE FLEXIBILITY AND CONTROL OVER THOUGHTS (CALLAGHAN AND CORBIT, 2015).

CENTRAL TO EMOTIONAL DEVELOPMENT IS LEARNING TO LABEL AND MONITOR FEELINGS AND THOUGHTS. THE ABILITY TO USE SYMBOLS IN THEIR FULL RICHNESS, SUCH AS IN POETRY, OR TO USE WORDS TO UNDERSTAND THOUGHTS OR FEELINGS, IS SOMETHING THAT SOME CHILDREN BARELY DEVELOP. BECAUSE SYMBOLS ARE ARBITRARY, WITHOUT FIXED MEANINGS, AND MEANINGS CAN VARY DEPENDING ON A SPEAKER’S STATE OF MIND AND INTENTIONS, SOME PEOPLE WHO STRUGGLE TO GRASP MENTAL STATES ARE PARTICULARLY CHALLENGED, SUCH AS SOME ON THE AUTISTIC SPECTRUM. LINKED TO THE ABILITY TO USE SYMBOLS IS THE CAPACITY TO UNDERSTAND OTHER PEOPLE’S MINDS. WHAT DISTINGUISHES HUMAN LANGUAGE FROM THE RUDIMENTARY COPYCAT WORDS THAT PARROTS CAN USE, OR THE ALARM CALLS THAT MONKEYS MAKE, IS SUCH PSYCHOLOGICAL UNDERSTANDING. LANGUAGE USE IS NOT JUST ABOUT SIGNS, THAT ONE WORD ‘STANDS FOR’ A THING. IT REQUIRES THE ABILITY TO ‘TUNE IN’ TO ANOTHER’S MIND, TO MAKE SENSE OF THEIR INTENTIONS. TO BEGIN TO EXPLORE THIS, ONCE AGAIN, I WILL START WITH EARLY INFANCY.

PARENTESE AND INFANT-DIRECTED SPEECH

THE PRECURSORS OF LANGUAGE CAN BE SEEN IN THE EARLY PARENT–INFANT RELATIONSHIP. MARY BATESON ORIGINALLY COINED THE TERM MOTHERESE TO DESCRIBE A WAY OF COMMUNICATING WITH BABIES SEEN IN MOST CULTURES (1971). MANY NOW USE THE WORD PARENTESE INSTEAD, TO AVOID THE GENDER-BIASED ASSUMPTION THAT ONLY MOTHERS DO THIS, AND SOME ACADEMICS USE THE LABEL INFANT-DIRECTED SPEECH (IDS). PARENTESE HAS CLEAR CHARACTERISTICS; WE TEND TO SPEAK TO BABIES USING A HIGHER PITCH, LONGER HYPERARTICULATED VOWELS, SHORTER PAUSES AND MORE REPETITIONS THAN IN USUAL SPEECH. INFANTS SHOW AN INTEREST IN THE RHYTHM, PROSODY AND TEMPO OF SPEECH LONG BEFORE THEY UNDERSTAND THE MEANING OF WORDS [MALLOW AND TREVARTHEN, 2009]. NOT ONLY MOTHERS, BUT FATHERS, GRANDPARENTS AND CHILDREN AS YOUNG AS FOUR YEARS OF AGE TEND TO AUTOMATICALLY ADOPT THIS WAY OF SPEAKING WITH BABIES, EVEN SPEAKING TO PETS IN THE SAME MANNER [PREVIDE AND VALSECCHI, 2014]. IN EXPERIMENTS WITH INFANTS USING LANGUAGE STRIPPED OF ITS GRAMMATICAL MEANING,
parentese has been shown to be superior to traditional adult-directed speech for communicating intentions and expectations.

Infant-directed speech or parentese is common in nearly all cultures studied. Central to it is a musicality that facilitates the regulation of social and emotional relationships (Mithen, 2006). There is some variation between cultures, such as Japanese mothers using a slightly lower level of emotional expression, but these tend to be minor, as was found by Fernald (1993), who has travelled the globe examining mother–infant speech patterns. In an interesting experiment, parentese that expressed prohibitions was played to babies in four languages, and also in English using nonsense words. In addition, loudness, which is generally the most significant difference between approval and prohibition, was filtered out, so infants were primarily responding to ‘melody’. The infants consistently frowned when the speech expressed prohibition and smiled at the phrases expressing approval, showing how intentions in a speaker can be communicated simply via the musicality of speech.

Infants can understand extremely subtle differences in sounds, and differentiate separate words from what is really a continuous ‘sound-bath’ (Marchetto and Bonatti, 2015). This sophisticated task requires detecting statistical regularities in spoken sentences, and is how one differentiates specific words and part-words from a stream of sound (Saffran and Thiessen, 2003). Spoken sentences do not have gaps between them like written words, making this feat all the more remarkable. In one experiment eight–month-olds were exposed to sound streams denuded of all prosody and melody, and a few nonsense words, such as like ‘bo-ti-nim’ were placed several times into the sound-stream. The infants somehow worked out which sounds had appeared regularly. They could similarly extract the patterning when listening to musical tones, again suggesting a link between linguistic and musical abilities.

Musicality is fundamental to early language use, triggering reward circuits and interpersonal skills (Wang, 2015). Babies, including premature ones, are soothed by soft songs and gentle music, which regulates the autonomic nervous system and lowers cortisol levels (Trehub et al., 2015b). Across cultures babies are soothed by lullabies, which generally have similar melodies, rhythms and tempos. A mother’s voice singing lullabies to premature infants increases sucking abilities, thereby aiding weight gain, stabilising oxygen saturation levels, and improving general physical development (Picciolini et al., 2014). Singing improves infant mood, sleep, eating and learning, and is central to how infant emotional life is regulated.
The role of positive emotion in this is crucial. When infants are presented with both adult-directed speech and parentese, they generally prefer parentese, but when emotion is held constant, neither negative nor positive, infants show no preference. More positive adult speech is preferred to emotionless infant-directed speech (Singh et al., 2002). The lilt and melody of parentese has a positive tone that naturally inspires interest (Corbeil et al., 2013). Parentese is both more emotionally expressive than ordinary adult speech, and more positive, and through it the precursors of early language learning are interwoven with learning about the world of emotion.

CULTURE AND LANGUAGE

A seemingly rare exception to the universality of parentese is seen in the Kaluli of Papua New Guinea (Ochs and Schieffelin, 2009), whose speech lacks the lilting softness and high-pitched tones. Here infants and children are rarely addressed directly. Infants learn by observing how adults or older children speak to each other, not through parentese nor the dyadic interactions we in the West might assume to be natural. The Kaluli expect children to fit into adult speech patterns and barely attempt to understand what a child might be thinking; believing that one can never know what is in another’s mind (Sicoli, 2015).

Similarly the Gusii of Kenya believe that if you talk too much to your children then they end up self-centred (LeVine, 1994). Gusii children are immersed in adult conversation but are not talked to or taught to talk. The Western middle-class ideal of lots of dyadic mother–infant communication again does not pertain. As ever, we cannot assume universality for what we think of as natural.

The relationship between culture and language is more complex than such variations. One cannot understand culture without language or vice versa. Language provides basic tools for thinking, and as importantly, for becoming culturally embodied. Birdwhistell (1970) showed that bilingual Kutenai tribespeople consistently moved in different ways depending on whether they were speaking Kutenai or English. They literally embodied not just rules of speech, but also the feeling and cultural mores expressed via language. Language can thus be viewed as ‘performance’ (Butler and Athanasiou, 2013), and for those learning a second language it is often accompanied by new social roles and ways of being (Burck, 2005).

As already noted, infants are learning about language even before birth, and are able to recognise voices and words from their time in the womb (May et al., 2011). Two-day-old babies have a preference for their native tongue, presumably because of
exposure *in utero*, and humans are primed to be socialised into their own cultural mores [Moon et al., 2012]. Infants are born very sensitive to sounds, but their ability to distinguish between them diminishes quickly so that by the end of the first year they are less capable of differentiating sounds that are not used around them. For example, at around this age a Spanish baby would stop distinguishing so well between a ‘b’ and a ‘v’ sound. Kuhl (2011) and colleagues undertook research in Japan, watching when babies stopped noticing that the sounds in certain words were changed from what we know as ‘l’ to ‘r’ sounds. When the babies successfully noticed a change she was relieved and smiled, only to look around and note that her Japanese colleagues had not noticed anything. The infants still had a skill that her adult colleagues had long since lost.

Interestingly, the West African Beng have a religious explanation for such infant capacities. In their belief system, babies are born able to speak every language. It is believed that in *wrugbe* or the afterlife, where babies are believed to come from, all languages are spoken. Children are said to only slowly shed other linguistic understandings during the first years, understandings that had derived from *wrugbe*. If we translate *wrugbe* as evolutionary or cultural inheritance, theirs might seem a surprisingly accurate view, much more so than the idea of humans as a *tabula rasa* in relation to language. Language use becomes culturally distinct in the first year or so and helps distinguish whether someone belongs in one’s group or not, aiding processes of group cohesion.

**INTERSUBJECTIVITY AND LANGUAGE LEARNING**

In the West developmental psychology has tended historically to focus more on individual than social development, but there is increasing understanding of the social and emotional nature of language. The Russian psychologist Vygotsky (1962) particularly emphasised the influence of social factors on individual development and the links between social learning and language, describing how children internalise culture, thinking capacities, and ways of being from parental figures and other adults. Social constructionism has similarly emphasised how the world is partly created through culturally specific linguistic understandings (Gergen, 2009) or what Bourdieu described as the *habitus* (1977).

It is often assumed that children learn words for objects through having things pointed out to them. Parents often ask questions like ‘what colour is that?’ or say things like ‘that is a doggy’. Many other cultures do not have this form of ‘teaching’ language, and
instead words are picked up from the ordinary flow of social interaction. Children particularly learn through making sense of the intentions of those around them. It is almost definitely no coincidence that there are mirror neurons in Broca’s region of the brain, central for language use. These neurons allow us to read the intentions of others, something that is necessary to use language effectively. In one experiment with two-year-olds, Tomasello and Merriman (2014) invented verbs for actions, and these verbs were then used (e.g., ‘plinnock’) when a particular act was performed. The infants were later able to associate this made-up word with the action, but only when they could read the intentionality that went alongside the use of the word. These infants were entering a complex intersubjective universe requiring an understanding of adult’s intentions, and building on skills like social referencing and joint attention. This is why some children on the autistic spectrum, lacking the more usual understanding of other minds, can struggle with the subtle nuances of meaning. Simple statements such as ‘that’s hot’ mean something completely different depending on whether the speaker is complaining about the temperature of a drink, or showing pleasure in the summer sun, describing an item that is fashionable, or subtly hinting that someone should turn up the air conditioning.

As the philosopher Wittgenstein (1974) taught us, the meaning of a word derives from its use in the language games of social discourse, rather than simply referring to something external in the world. It is from a word’s use in a variety of context that its meaning becomes particularly clear to babies (Roy et al., 2015). In another experiment by Tomasello an adult told a child that they were looking for a ‘toma’. The adult then picked up various objects, which were unfamiliar to the children, and made gestures, such as disappointment or excitement, indicating whether they had found it, and sure enough these infants soon picked up the meaning of ‘toma’. This is more than pointing at an object and naming it; they had to understand wishes and intentions to decipher the meaning. Such learning is quite a feat for young children faced with a new sound and several possible things to which it might refer. Children as young as 18 months work out the meaning of words through deciphering adult behavioural cues, such as by watching lines of vision and emotional expressions, thus joining a joint-attentional world.

The skills infants are learning in their first months, such as imitation, the to-and-fro of early proto-conversations, the subtle dances of dyadic interaction, are all building blocks for later language use. Beebe showed that the rhythms of adult-infant communication are similar to those seen in conversations between adults, in terms of timings, pauses, and how infants look at and away from conversational partners (Beebe
and Lachmann, 2002). Preverbal interactions are providing a rhythmic understanding of how conversational dialogue works. There is a developmental line from very early interactions to joint attention at about a year. The discovery of mirror neurons has added weight to the link between language use and understanding other minds. Nonverbal gestures are central to spoken conversations, language and symbolic communication developing from the foundation of gestures and actions (Fonagy and Target, 2007). Moving in the same rhythm as someone’s speech is often a sign that one wants to join in a conversation. Skills such as switching a conversation, or changing emphasis, are achieved through nonverbal means such as facial expression and hand movements, skills being learnt well before words.

It is no coincidence that words arrive more or less when children become aware that people have separate minds. Proto-declarative pointing, such as pointing excitedly at an object that you want someone else to appreciate, demonstrates a wish to share an experience, and so to build intersubjective bridges between people. Again some on the autistic spectrum struggle with this, only managing proto-imperative pointing, a more instrumental than intersubjective motivation, pointing because they want something passed to them.

Children work out what another person understands and adjust their communications accordingly. In an experiment children of about two saw a toy being hidden. Some knew that their mothers had hidden this toy, while others knew that their mothers did not see the toy being hidden (Akhtar and Tomasello, 2000). Children were more likely to name both the toy and where it was hidden when they assumed their mothers did not know its whereabouts. In other words, they had worked out what was in their mother’s mind and hence what they needed to communicate to ensure the object was successfully retrieved. Slightly younger preverbal children similarly used different kinds of gestures depending on whether or not they thought their mothers knew where the toy was. Such skills need some understanding of another’s mind. When adults express incomprehension to one-year-olds these children tend to try all manner of tactics, from repeating themselves to exaggerating gesticulations to substituting different gestures, requiring considerable intersubjective sophistication (Golinkoff, 1993).

Joint attention at 14 months predicts language development at two years, or in other words, the better a child is at understanding other minds and intentions, the better their language skills are likely to be (Mundy and Burnette, 2005). How well a child follows its mother’s attention during interaction predicts word comprehension when
language proper comes into play (Silvén, 2001). Thus language is an inherently intersubjective process that ‘human beings have collaboratively invented for establishing, regulating and maintaining intersubjective interactions with fellow human beings’ (Akhtar and Tomasello, 1998, p.334).

**LANGUAGE AND BRAINS**

We have to be careful to avoid claims about language being processed in specific brain areas, as the reality is more complex than this. Many researchers assume that the left hemisphere is dominant for language use (McGilchrist, 2010), alongside more linear and rational thought, while the right hemisphere is dominant for emotionality across many species (Corballis, 2014). There is some truth in this. Even babies when babbling open their mouths more on the right side, suggesting left hemisphere activation (Holowka and Petitto, 2002), and indeed that is what scans show (Shultz et al., 2014). The same regions of the left hemisphere that adults use in speech are also very active in infants (Dehaene- Lambertz, 2000). However, to be a language user one must be able to use and bring together many facets of the personality, and link many separate brain functions and regions. Human language also remains closely linked to the brain’s emotional centres and both cognitive and emotional capacities are central to language use. Indeed the extent of right hemisphere use in language differs by gender and by culture: Asian language users depend more on their right hemispheres (McGilchrist, 2010), a Turkish whistling culture uses both hemispheres (Güntürkün et al., 2015) and females, in Western samples at least, use their right hemispheres more in speech than males do.

Two particular regions, Broca’s and Wernicke’s areas, both found in the left hemisphere, are central to language use. Damage to Broca’s area in adults leads to an inability to produce words, even if sufferers can generally still understand them. If Wernicke’s area is damaged sufferers can form words, but their understanding is limited. Such discoveries suggest a difference between thought and language, and that words can be used to capture thoughts. For example Solms and Kaplan-Solms (2001, p.104) describe a patient suffering from the brain and language disorder Wernicke’s aphasia, who said ‘I know what I want to say but I can’t find the words; they just aren’t there. And then, before I can find the words, the thought is gone’. This is a graphic if painful example of how words and thoughts cannot be conflated.

Language use depends on **procedural** rather than **declarative memory**. For example, patients who have lost their memories, and who cannot make meaningful
sentences, still use the same grammatical structures as other people (Ferreira et al., 2008), based on nonconscious learnt templates.

There are definite windows of opportunity for developing the ability to use language. If one learns a second language after one’s first few years, then one uses a different part of the brain for that second language than for one’s first language (Klein et al., 2014). Children with little exposure to speech in their first years rarely use language fully, and often have problems with complex grammatical forms. Many severely neglected children show an inability to use language normally, and reports of feral children suggest something similar (Newton, 2002).

A famous example was Genie, imprisoned by her father at 18 months and discovered at 13 years of age in the 1970s who, despite attempts to teach her language, managed only rudimentary speech with little syntax. It seems likely that brain areas for learning language atrophy with lack of use at the right time. Similarly many late-adopted children reared in depriving orphanages show deficits in linguistic capacity, in social understanding and have different brain activation in areas associated with language use (Helder et al., 2014; Rutter et al., 2007). Social interaction and having someone attuned to one’s experience, as well as exposure to language, are all necessary for verbal and communicative abilities to flourish.

Of course to communicate verbally we need to understand something of the other’s states of mind. This can be hampered by developmental disorders such as autism, by early experiences and also when the cultural expectations of speaker and listener are alien. Burck (2005) quotes a second language speaker who was asked by a teacher ‘what is the magic word?’, the teacher assuming that the pupil would understand this magic word to be ‘please’. However, the pupil came from a culture that did not require such expressions so his lack of the use of ‘please’ was considered rude in Britain whereas in his own family doing things for others required no words signifying gratitude. Having such an understanding of others, and being able to work out something about their thoughts and feelings, is a prerequisite of successful language use.

LANGUAGE AND EMOTIONAL PROCESSING

We have seen from the attachment research that parents who score ‘secure-autonomous’ in the Adult Attachment Interview are likely to have securely attached children. Such parents can use language to make sense of emotional experiences, creating coherent narratives. Using words to describe internal states such as emotions is an aspect of affect regulation. For example verbalising and labelling
fears downregulates brain regions such as the amygdala (Kircanski et al., 2012). When subjects re-appraise pictures that they have seen using language, this lessens arousal levels and helps regulate emotions. Labelling difficult emotions downregulates fear responses (Hariri et al., 2000) and lowers cortisol levels (Daubenmier et al., 2014). However trauma can have the opposite effect, and van der Kolk found that PTSD suffering war veterans used Broca’s area less and struggled to put experiences into words (2014).

Ordinarily putting feelings into words helps an individual manage difficult emotional states. Indeed, it has consistently been found that writing about difficult experiences aids both emotional and physical health. In particular it is the ability to shift from first person pronouns (‘I’) to third person (‘he’, ‘she’) or ‘we’ statements, that is linked with enhanced health outcomes (Pennebaker, 2012). Children who are able to share difficult experiences with parents, and feel understood and heard, later describe these experiences less negatively (Horstman et al., 2015). The ability to use words ‘mindfully’ to process experiences, and in self-reflective ways, facilitates both affect regulation and also executive functioning (Winsler et al., 2009). This is seen in many therapies.

If we develop the psychological equipment to process difficult experiences, we no longer have to defend against them so much. Using words in a coherent narrative to reflect upon emotional states is linked with secure attachment and mind-mindedness (Meins et al., 2012). Such findings have consequences for practitioners. Children who struggle with impulsivity often have low verbal skills (McEachern and Snyder, 2012), and insecurely attached children tend to have parents who do not develop complex narratives about their emotional lives. Avoidant attachment tends to be accompanied by a limited capacity to use words to describe emotional experiences. Using language to put thoughts and feelings into words is a primary way in which emotional intelligence or literacy develops, as well as being a central tool of therapeutic work.

LANGUAGE ABILITY AND SOCIAL ADVANTAGE

Language skills, perhaps particularly in the West, confer considerable advantages on children and adults. Linguistic skills differ according to how much language is valued in a family, social group, or culture as a whole, and how much children are exposed to it. In a fine-grained study Hart and Risley (2003) taped the speech of families and children throughout their first years. The families were grouped according to whether they were welfare (i.e. out of work), working-class, or professional families. The
researchers aimed to count the words a child heard in every interaction with its parent or caregiver. The analysis revealed stark class differences. A professional’s child had had 50 million words addressed to it by the age of four, compared with the working-class child’s 30 million words and the welfare child’s 12 million. In other words the welfare child heard less than a quarter of the number of words that a child of professionals heard. In an average hour the child of professionals had 2100 words addressed to them while the working-class families had 1200 and the welfare families just 600. Maybe even more worryingly, by three years old children of professionals had received about 800,000 encouragements and only some 80,000 discouragements. However, the children of welfare parents had only been encouraged 60,000 times thus far, but had received twice as many discouragements. This is indicative of how psychological outcomes are closely connected with social determinants such as poverty, psychosocial stress and status.

These children generally turned out similarly to their parents in terms of vocabulary and verbal interaction styles. A child’s measures at three years old also predicted later school results. Of equal worry was how IQ corresponded with vocabulary, with the professional child having an average IQ of 117, and the working-class child one of only 79. These early findings held up right until age 10. The sample size was admittedly relatively small, but nonetheless these results fit with other research, although a re-analysis suggested that parental educational level was at least as important as socioeconomic class (Rindermann and Baumeister, 2015). Exposure to a wide vocabulary, more encouragement, less discouragement, more ordinary interest in children’s mental states, less stress, and more positive feeling, all are likely to stimulate verbal and other abilities. Lest one becomes too deterministic, these results were not just about words spoken to, or indeed ‘at’, children, but this and other research has consistently shown that what counts is how much parents respond verbally to a child’s gestures, communication, or other initiation of communication (Tamis-LeMonda et al., 2014). As ever, it is being involved in two-way interactions that counts most. Hart and Risley’s work is just one example of how a social dimension can inform an understanding of language. Others might include having a particular dialect or vocabulary, such as an English public-school accent or a working-class dialect, as yielding tremendous advantages or disadvantages. Words and speech forms have meanings that take on a particular flavour for individuals, and as Bakhtin (1982 p.293–294) writes

> each word tastes of the context and contexts in which it has lived
> its socially charged life ... language only becomes one’s own when
the speaker populates it with his own intention, his own accent ... language is not a neutral medium that passes freely and easily into the private property of the speaker’s intentions; it is populated – overpopulated – with the intentions of others.

KEY POINTS

- Communicating is about more than just words, it is also a gestural bodily process.
- Sophisticated language use depends on developing capacities for intersubjectivity, for emotional and social understanding, which in turn is dependent on sensitive mind-minded parenting.
- Language can be used to process emotional experience and deactivate stress and threat systems.
- Language can be used in the service of deception or emotional honesty, for support or threat.
- Language can be used in a dead, stultifying way or in a lively, expressive way; it can open up previously un-thought symbolic or imaginary realms, or close down thinking.
- Language can be the medium for the most intimate of communication and yet can also be the way people distance themselves from others, and from their own emotional selves.
- Language is dialogical and potentially a way of knowing the other, and of course oneself.
- Language development arrives as infants realise that minds can be joined and can share in attending to something, whether an object of fear, or a pleasurable moment.
- Not all infants develop sophisticated linguistic capacities, such as neglected children and those with some neurological disorders.
EPIGENETICS
THE END OF THE NATURE-VERSUS-NURTURE DEBATE

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Getting Ahead of ADHD
By Joel T. Nigg
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New brain imaging technologies have brought us a new understanding of how the brain develops and how it works. And new genetic discoveries have changed the picture of how ADHD is caused. We no longer view ADHD as a simple matter of the wrong genes, or DNA, causing one part of the brain (like the frontal cortex) to be too small. That model is too simple all the way around. It is far more likely that DNA confers “liability” or “susceptibility” to ADHD. An analogy might be the predisposition to catching a cold. If your child is tired and run down, she will catch a cold at school more easily in the winter. She is more susceptible. Genes can also make us more or less susceptible to a neurodevelopmental problem. The box on the next page describes how scientists know that complex diseases like ADHD are usually related to genetic susceptibility plus other factors.

The emerging insight, likely to become a dominant paradigm in the coming decade, is very different from the old. Where the old paradigm tended to see ADHD, at least implicitly, as basically an inherited condition, the new paradigm sees ADHD as the result of environmental modulation of genetic tendency or susceptibility. We are beginning to see how brain formation, assembly, and development rely on these epigenetic processes.

A major driver of this evolving understanding is a field called behavioral epigenetics. Epigenetics is a word with many meanings. Some people have used it simply to mean the vast array of developmental changes “on top of” the genome that occur during development. But I intend a specific biological meaning. That meaning refers to specific stable biological changes in which the body forms a chemical marker to attach to the DNA molecule, changing its expression in a particular cell or type of cell. That change is sustained over time (e.g., during cell division) and sometimes inherited across human generations. This definition is consistent with the current definition used by the U.S. National Institutes of Health.

This change in gene expression influences behavior and health. Types of epigenetic changes include DNA methylation, micro-RNA expression, and histone modification, among others. Let’s take DNA methylation, the most common type of epigenetic change, as an example. A molecule called a methyl group attaches to the DNA, blocking that particular DNA molecule from RNA transcription—in effect, “turning off” the gene in that cell. This changes the RNA signature and the chemical cascade and biological effects of the gene—including in the brain. Removing the methyl group molecule can turn the gene back on. Some epigenetic changes are preprogrammed in our DNA (like the differentiation of cells into neurons, skins cells, and so on during...
FOR COMPLEX DISEASES, GENES CONFER SUSCEPTIBILITY, NOT DISEASE ITSELF

Genetically there are two kinds of disease: simple and complex. Simple disease is caused by a single dominant or recessive gene. Sickle cell anemia is an example of a single-gene recessive disorder. If you get both copies of hemoglobin beta gene on chromosome 11, you get the disease. PKU (phenylketonuria) is a single-gene neurodevelopmental disorder. Kids with PKU get the disease if they get two copies of the PAH gene on chromosome 12.

Complex disease is caused by a combination of factors—either two or more genes, or a partially expressed gene in which a gene’s expression is modified by other factors, or a gene or genes plus an environmental trigger. A complex disease can also include some cases caused by a single major genetic mutation, but that mutation does not explain most of the disease, only isolated cases. Most modern diseases are complex diseases—these include cancer, diabetes, obesity, and psychiatric disorders. Even infectious disease is complex, because it combines genetic susceptibility (usually conveyed by a combination of several genes) with an infectious microbe. For example, a major review of twin studies of tuberculosis revealed that tuberculosis had a twin heritability similar to that of ADHD. That means the susceptibility variation in the population is mostly genetic. However, tuberculosis obviously is present only when an infection follows. In an analogous way, ADHD is probably caused not by DNA, but by DNA-transmitted susceptibility, combined with particular environments. In a study my colleagues and I published in 2016, we demonstrated this “proof of concept” using the environmental pollutant lead [see Chapter 6 for more on lead]. We showed that the association between supposedly mild levels of lead exposure and ADHD was quite strong or quite weak depending on which mutation of the HFE gene a child had. The HFE gene modulates iron uptake in the gut; iron in turn interacts with lead to change the final metabolic effect on the brain.
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Epigenetic effects, of which DNA methylation is one. Epigenetic changes like DNA methylation can be caused by both biological and psychological experiences, including nutrition, pollution exposure, stress, learning, and others discussed in the rest of this book.

We can say with confidence that genes don’t determine who you are; rather genes in interplay with the environment shape our development. In a statistical analysis, this interaction of DNA and experience is called genotype × environment interaction or G×E. You’ll see a lot of studies on G×E if you venture into the medical or psychological literature these days. One way G×E carries out its effects is by epigenetic change. Epigenetic change is to DNA as control dials are to the electronic circuits on your car stereo. The stereo plays something very different when you change the bass–treble ratio, change the volume, or even change the station. After you change the settings, the new volume stays that way until you change the dial again. Yet the underlying electronics have not changed. Similarly, an epigenetic change happens on a gene in response to an event and then remains there, on the DNA, for a period of time until something happens to reverse it. The original epigenetic change may have been due to an event—say a very stressful pregnancy, or exposure to pesticides in the home, or lead in the school, or eating a very healthy or very unhealthy diet. The change then has a certain stability. Just like the radio volume doesn’t change until something happens (you turn the dial again), the gene expression altered by the epigenetic mark after an experience may stay that way until another event reverses it or adds to it. For example, it appears that the epigenetic changes caused by stress can be reversed by aerobic exercise (see Chapters 4 and 7).

It is likely that most complex diseases and behaviors related to conditions like ADHD are related to G×E. We call it G×E because the same epigenetic change doesn’t happen to everyone who has a particular exposure or experience. The effect is an interplay between the experience and the person’s other characteristics, including the individual’s DNA.

HOW DID WE GET HERE?

Historically, two major—and oversimplified—theories about what causes ADHD and about how people develop self-control or self-regulation have pervaded our society. The first says that it’s all about the parents. If you were a better parent, your child would behave better! Some of you probably believe this about yourself, and you blame yourself for your child’s ADHD problems. I have worked with parents who are quite depressed because they are sure their child’s ADHD is due to their inability to parent
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effectively. The second basic explanation is that it’s genetic. This idea took over in the 1980s and 1990s as genetic research got under way and studies of identical twins showed not only that ADHD runs in families but also that most of the variation between people is due to variation in their genes. This led some professionals and parents to think that the only way to treat ADHD is biologically (medication) and that a person with ADHD is fated to have it for life—after all, it’s genetic, and things that are genetic supposedly never change!

Researchers studying stigma find that families with ADHD get unfairly stigmatized either way. While some of this rejection is related to reactions to the child’s difficult behavior, other reactions seem to be based on stereotypes of what ADHD is. Parents are shunned sometimes because other parents don’t want “failed parents” (as they mistakenly see it) and their “badly raised” kids around. But when people believe ADHD is genetic, they see the child with ADHD as defective and still don’t want to be close to her or the family.

The most recent science has enabled an increasingly clear alternative understanding. We can now see that while both ideas (early experience and genetics as cause of ADHD) have a truth to teach us, both are so oversimplified as to be more misleading than useful by themselves. The new and coming science of ADHD and of human development is teaching us a new way to understand genetics, while also showing us much more about how parents can help their children develop self-control, self-regulation, and healthy maturity.

THE END OF THE NAIVE GENETIC PARADIGM

We know that ADHD runs in families and that genetic variation accounts for a lot of that, from twin studies. In fact, the past thirty years have been eye-opening in demonstrating the widespread influence of genetic makeup on nearly all aspects of human variation, from personality to intellectual ability. But genotype is far from the entire story. The simplistic genetic paradigm for ADHD (and other diseases, traits, and behaviors) was that genetics is genetics is genetics: Just like you can inherit blue eyes or Huntington’s disease from your parents, you inherit ADHD. And if you do, well, according to this simplistic view, that’s just bad luck. Not much you can do about it (at least at our present level of technology; see the box on the next page for a peek into the future). DNA indeed doesn’t change after conception. Many experts not too long ago believed it was just a matter of time before we discovered the major gene or genes responsible for ADHD.
While it is true that there’s a substantial genetic influence on ADHD, this simplistic idea of what genetics means is now outdated. The paradigm has turned out to be wrong in two major ways:

1. There is no single gene (or even a few genes) responsible for causing ADHD.
2. What is inherited via DNA is not ADHD itself—it is a propensity.

**WANT TO LEARN MORE ABOUT GENE EDITING?**

For explanations accessible to the layperson, see the August 2016 issue of *National Geographic* (www.nationalgeographic.com/magazine/2016/08/dna-crispr-gene-editing-science-ethics) or watch the TED Talk by Dr. Jennifer Doudna, who made the initial discovery in 2012 (www.youtube.com/watch?v=TdBAHexVYzc).
Twenty years of research have failed to find “the gene” for ADHD or any other major behavior or mental disorder. Scientists now recognize that this is because, with the exception of some rare genetic mutations that occur in only a small number of cases, most of ADHD is influenced not by one major gene but by hundreds or thousands of tiny genetic effects. As this book goes to press the Psychiatric Genetics Consortium is preparing to report genetic results from a study of over 20,000 ADHD cases and 35,000 controls from twelve sites around the world (although more than 14,000 of the cases and 20,000 controls are from Denmark). Results reveal the first confirmation of genetic markers that are statistically dependable in ADHD—but each marker has only a small effect. While we are now beginning to identify these individual effects, the large number of small effects means that genes aren’t destiny; rather, they affect probability. An old slogan of medieval soothsayers was purported to be “The stars incline but do not compel”; a similar logic is about right for how genes work in complex disease and human traits.

Second, mathematical proofs show that the twin studies reveal not that we inherit ADHD but that we inherit what genetic scientists call liability to disease or outcome. A commonsense proof of this came from twin studies of infectious diseases like tuberculosis, which also show substantial heritability of liability. While ADHD does not result from infectious disease, the concept is analogous. This liability may either be a vulnerability (at risk for ADHD with no compensating benefit) or a susceptibility (extra-sensitive to environmental inputs for good or for ill). To put it simply, complex diseases and disorders like ADHD are rarely if ever caused by genes on their own, but typically by specific sets of genes in the context of specific developmental experiences. These experiences act like triggers that bring to fruition the potential in the genes.

This makes sense if you reflect on it—when someone comes to work sick, not everyone gets sick even though everyone was exposed. Part of the reason is inevitably genetic differences in our propensity to catch colds. But on the other hand, the genetic propensity to catch a cold won’t guarantee you catch a cold—if you avoid exposure, wash your hands, and are well nourished, you may avoid most colds even though you are genetically vulnerable. Vulnerability itself is a combination of genetic propensity, environmental risk and protection, and a particular disease-triggering exposure.

In the past decade, and particularly in the past five years, these genotype × environment combinations have moved from concepts into proven specifics. Scientists now have discovered specific G×E interactions related to child behavior and emotional problems, learning problems, and neural development. Several G×E effects are now established in mental disorders. See the box on page 47 for a couple of examples.
The genes discussed in the box are also suspected or known to be associated with ADHD. For example, my colleagues and I and another group of researchers independently reported in 2016 that ADHD is associated with mutations on the serotonin transporter promoter gene interacting with parenting characteristics. Other genes may have similar interaction effects with the social or biological environment but are not yet confirmed. (I will discuss some other very important G×E effects in later chapters.) Although the specific effects in ADHD are not as robustly established to date as the effects in depression (a handful of studies versus the eighty-one studies to date in depression), the direction is clear: G×E interactions are increasingly seen as involved in the development of ADHD.

It is crucial to remember, as also noted in the box, that these G×E effects may sometimes involve not just increased risk for disease or for ADHD (what some scientists specify as genetic vulnerability) but rather increased sensitivity to experience (what some scientists specify as the meaning of genetic susceptibility). In other words, it may not be accurate to say that some children are prone to ADHD and others are not. It may be more accurate to say that some children are exceptionally sensitive or responsive to their early experiences, for good or for ill, compared to others. Based on current evidence, it is likely that both effects influence child development, but it is too early to tell how much each kind of effect bears on ADHD.

As I note again later in the book, some gene × environment interactions are very important for another reason. They may show us how a particular genotype in a child indicates a need for a particular intervention—a particular change in a nutrient, for example. Genetic research is also very important for showing us what kinds of physiological systems are driving some aspects of ADHD, and this can open up new treatment ideas for influencing those systems. For example, if inflammation is involved, then treatments to reduce inflammation may be helpful.

Can a G×E interaction cause a change in the brain and behavior? If so, how? The answer to both questions comes from recent studies that directly examined epigenetics.
EXAMPLES OF RECENTLY DISCOVERED G\times E INTERACTIONS IN MENTAL HEALTH

Depression. A 2016 review of the literature noted that stressful life events (in utero or in childhood) are more likely to result in depression for children later if they have particular alleles (mutations) of one of a handful of genes that affect brain signaling in the frontal cortex and other brain regions. The most well established is the serotonin transporter gene. The association of depression with the interaction of mutations on that gene and stressful events was confirmed in a formal meta-analysis of eighty-one studies reported in 2014. The probability that this G\times E interaction is a chance effect is less than one in 1 million. Other studies suggest that these G\times E effects on depression are transmitted by epigenetic changes in susceptible individuals.

Antisocial Behavior. The monoamine oxidase type-A brain receptor has a particular gene that encodes it, called the MAO-A brain receptor gene. It has a promoter polymorphism that confers susceptibility to aggression and antisocial behavior. Children in an antisocial peer group or exposed to abuse were seen in several studies to be more likely to develop aggressive and anti-social behavior when they had this particular gene mutation. This effect was supported by findings in a large national study in 2016, where children exposed to physical abuse were found to be more likely to become aggressive and antisocial if they had this gene mutation. However, most intriguing was evidence from another large study in 2016. There, one particular MAO-A marker along with another genetic mutation, called COMT, interacted with parenting styles—"for good and for ill." That is, children with the sensitive genotypes were more likely to be aggressive when they had too little positive parenting and more likely to be prosocial when they had enough positive parenting.

INTERESTED IN READING MORE?


Sharpley, C. F., Palanisamy, S. K., Glyde, N. S., Dillingham, P. W., & Agnew, L. (2014). An update on the interaction between the serotonin transporter promoter variant (5-HTTLPR), stress and depression, plus an exploration of non-confirming findings. *Behavioral Brain Research, 273*(15), 89–105. Note that important variation in results of these studies suggest that other genes or experiences may over-ride these effects or create subtypes of depression.

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WANT TO READ MORE ABOUT GxE ASSOCIATION BETWEEN ADHD AND PARENTING?


HOW POWERFUL A ROLE DOES EPIGENETICS PLAY?

Scientifically, when basic chemical compounds attach to the DNA in response to an experience, they change which genes are expressed and by how much. These epigenetic effects can be quite powerful—just as large as genetic effects. In a sense, they can seem to override genetic effects. For example, in a classic experiment at Duke in 2007, Randy Jirtle and his colleagues cloned genetically identical agouti mice (essentially identical twins) and had them carried to term by two different genetically identical mothers. The mothers lived in identical conditions except that one group was exposed to bisphenol A (BPA), a plastic chemical found at that time in many food containers [discussed more in Chapter 6]. After birth, the genetically identical animals had identical rearing conditions and identical diets and chemical exposures. Yet the group exposed to BPA was large, fat, and yellow, and the other group small, lean, and brown. The first group had a change in DNA methylation that caused the agouti gene (and other genes) to express differently and create this difference in their growth. They also had behavioral differences. They were more different, by virtue of this early chemical exposure, than two genetically different strains of mouse. Those events occurred in skin (causing pigment changes) and in the brain (causing changes in feeding behavior and satiety and leading to obesity).

During pregnancy, such negative epigenetic effects can be prevented by counteracting the effects of the environment. Proof of this concept emerged when Jirtle and colleagues also showed in 2007 that certain dietary supplements during pregnancy, such as folic acid and vitamin B12, were sufficient to prevent these epigenetic marks from being created by the BPA. These types of supplements provided additional methyl molecules that make up for the methylation lost from the BPA exposure. The supplementation also reduced disease incidence later, even in the mice not exposed to BPA.
Since then, data have rapidly accumulated regarding the positive and negative epigenetic changes caused by different environments, both in utero and during childhood. While most of the work is in animals, parallel effects are also now being seen in humans. (We are much harder to study because it is difficult to get to epigenetic change in our brains, so scientists have to rely on indirect evidence from human saliva or blood, combined with direct studies of brains in animals and, rarely, a postmortem study.) In later chapters you’ll see how even as children are growing up, positive epigenetic change can occur, and negative epigenetic change can be reversed, by factors like exercise and nutrition. Negative epigenetic changes can be avoided by avoiding experiences like exposure to chemicals such as BPA. While showing these effects in animals is not the same as showing them in humans, it is highly suggestive, and some converging human evidence is beginning to emerge.

Why would a different experience, like exercise or diet, counteract the effects of stress or chemical exposure? One emerging model suggests that numerous early “insults” to development work through changes in a complex hormonal network involving inflammation, corticosteroid hormones, oxidative stress, and related processes that may be shared across numerous challenges—from poor diet to chemical exposure, to sustained emotional stress or trauma. Thus, as we learn more about how gene and environment effects work on those internal communication systems, we begin to see the outlines of a developmental process that can sidetrack brain development—and also provide tools for helping it get back on track.

Fortunately, a great many of the chemical responses to experience via epigenetics are conserved across species. This means that when we do look across species, we can see the same chemical events happening, and the same ones affecting the brain. We need only a few confirmations of this principle of conservation to use the animal findings. Even though human behavior has more determinants than animal behavior (such as our imagination of the future), if we have some of these confirmations already in hand, we can get a long way on what we know.

WANT TO READ MORE ABOUT DIETARY SUPPLEMENTS PROTECTING AGAINST BPA EXPOSURE DURING PREGNANCY?

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We don’t actually know how much of ADHD’s heritability is epigenetic rather than genetic, but my bet is that it will prove to be substantial. I believe that ADHD is not fated from conception and that there’s a lot of hope for correcting it. We just need to learn how. The view I suggest is that ADHD becomes more or less likely at conception due to genetic makeup. But its expression can and does change in relation to early and later development both in the womb and throughout childhood and adolescence.

CAN EPIGENETICS EXERT THEIR INFLUENCE ACROSS GENERATIONS?

The bottom line here is that epigenetic change can occur both before birth and during childhood (and maybe during adulthood). These changes can be positive or negative for health. They are fairly stable, but many if not all can be reversed by further experiences of the right type. It remains unknown to what extent the undoing of these effects must occur by a certain age. For example, we don’t yet know to what extent epigenetic changes stabilize after early childhood. However, animal studies show that at least some epigenetic effects can be reversed by experiences well into later childhood or early adult development and perhaps beyond. In later chapters, I particularly highlight low-risk, healthy steps that also have some evidence of either protecting against or reversing epigenetic harm. In addition, making the effort to reverse negative changes can be beneficial to your child, and it may even prove beneficial for your grandchildren. That’s because in some cases, if they are not reversed, epigenetic changes are passed on to the next generation. They can be in the “germ line” that passes on through the egg or sperm to an individual’s offspring. In effect they “ride along” on the DNA in inheritance. The DNA brings with it a chemical memory of some of the parents’ experiences (both fathers’ and mothers’) and passes it to the child.

The genetic inputs to ADHD therefore are an important part of the puzzle and remain a fascinating and important area of study. In fact, my laboratory is heavily invested in studying DNA changes associated with ADHD to help us understand biological systems in ADHD as well as genetic vulnerability and susceptibility. It is a virtual certainty that exciting findings will emerge from worldwide genetic studies going forward. But these will probably shed light on liability to ADHD and need to be completed by understanding the role of the environment. Therefore, my lab is also heavily invested in studying epigenetic effects associated with ADHD. Because epigenetic changes coming from early and subsequent experiences probably carry so much potential for new treatments and for insights you can use in your daily life, this book focuses mainly on the wealth of new discoveries about how experience changes.
the genome, the brain, and behavior and development, how we can apply that to ADHD now—and how we might do so even more in the future.

WHAT DOES THIS ALL MEAN FOR THE BRAIN?

The past generation has filled in many of the blanks in the truly astonishing processes of brain development. We now know, for example, that the brain develops dramatically not just before birth and during infancy, but all the way until the mid-twenties—especially the aspects of the brain necessary for mature self-regulation. This development includes not only growth but also pruning that hones the brain’s ability to meet ever-growing cognitive demands ever more efficiently:

• Very early life sees the “build-out” of neurons and neural connections, with a peak of neural connections at about age two. This neural “overgrowth” is what gives the human brain its remarkable versatility during infancy and toddlerhood. You have probably heard that a one-year-old can effortlessly learn any language in the world perfectly just by living with it, and you’re probably well aware that this is no longer possible for you as an adult.

• Beginning around the toddler years, the brain begins a long process of specialization by pruning less-used or ineffective neural patterns and solidifying those that are used and that work well to make us more efficient. This is how the child specializes for the niche, culture, or situation she is in.

• Development also includes the expansion of myelin, the coating around neural axons (connecting wires) that gives them their transmission speed—it gives them the equivalent of an upgrade from copper wire to fiber optics in terms of capacity and speed of information. This upgrade continues all the way into early adulthood.

• This build-out of the communication wires goes on through the first two or more decades of life. During adolescence, certain parts of the brain peak in size and begin to shrink to become maximally efficient.

• Also during adolescence, the brain is set up to lower the intensity of signals about risky situations—encouraging the adolescent to explore the world and take chances doing so. This pattern is seen not just in humans but in other mammals as well. That’s part of the reason adolescents can seem so impulsive while at other times being so reflective.

• Finally, neural networks communicate and solidify their relationships through frequent “oscillations” of shared electrochemical activity, in which they get familiar with their mutual firing patterns and develop practiced skill routines for
adapation to adult life. Basically, they establish a channel of regular communication so that when brain region A fires, region B pays attention—region A’s signals have been useful before and so are probably useful now too. This is how the brain learns, for example, to get a handle on strong emotions—region B (in the frontal cortex) learns to fire at the same time as region A (in another part of the brain) to modulate a signal of excitement or fear.

We also know that all of these major developmental processes are influenced by four major factors:

1. Genetic signals
2. Prenatal environment signals, mostly via food and maternal hormones such as stress hormones, but also via chemical exposures, all of which involve epigenetic signals
3. Ongoing childhood learning, experience, or stress, with its own epigenetic recordings
4. Adversity, trauma, or subtle injury throughout one’s life but especially during childhood development

Because of the role of experience and learning and its epigenetic recording in governing brain sculpting, human brain development is very sensitive, or responsive to its environment. That environment includes learning, experience, and stress, as well as food, chemical toxicants, and all physical and social inputs.

The main goal of this book is to explain the small set of critically important influences on the health of the developing brain and how you might harness those influences to counteract a genetic predisposition to ADHD, to minimize its severity in a child already diagnosed, or even to reduce heritability in future generations.

WHERE ARE WE HEADED?

The naive genetic paradigm is done, just as the naive environmental paradigm before it. We need genetics to understand susceptibility and vulnerability. But ADHD is best seen as coming from the interplay of genetic and environmental susceptibility and environmental triggers. Increasingly, this concept is moving away from a bland, generic “all of the above” assertion to very specific proposals regarding particular environments (and associated particular genes) and their differential relation to ADHD and overlapping conditions. This line of work converges with animal and human studies of specific environments to overturn some common beliefs from before. Chemical exposures were once dismissed as an unimportant influence on
ADHD; that’s no longer accurate. Similarly, both prenatal and childhood diet was thought to be unimportant. That is now changing. The long-standing neglect of the role of social disadvantage, trauma, and stress on ADHD (or ADHD-like problems) is also being corrected. The size of all these effects is not necessarily as big as some advocates would have you believe—but it’s still meaningful and on occasion can be decisive. My purpose is to help you get the right balance and understanding, to see the exciting possibilities, yet use them in a level-headed way, and to help you judge what will work for your particular situation. I hope by the end of this book you’ll see that in addition to professional help, you have a lot of options for helping your child—enough that you can choose the ones that will be both beneficial for your child and manageable for you and your family. Here are a couple of examples:

When Addison came in for his ADHD evaluation at age eight, he was irritable, short-tempered, inattentive, and restless. His parents noted that even though he could have a lot of fun playing, when left with nothing to do he just couldn’t seem to settle down. After consulting with friends, their pediatrician, and other sources, they began to consider food as one option. It dawned on them that he also was a picky eater and had consistent digestion problems such as constipation. They got advice from a dietician and undertook several key diet changes discussed in Chapter 3. Gradually, after several months, Addison began to be calmer, less irritable, more focused. He also enjoyed his food more, was hungrier, and had better digestion. While it’s not always the case that food-related problems and ADHD come with obvious digestive issues, and while dietary changes may help only a minority of children with ADHD, the pattern here was notable and consistent with what new studies have shown can happen.

Machiko, by age eight, was having frequent arguments and fights with other children, was losing friends because she was too bossy, and had frequent temper tantrums at home that her single mother, Tori, described as “drama-queen” overreactions. Machiko had been diagnosed with ADHD in first grade due to her restlessness, overactivity, and inability to focus for any length of time on her schoolwork. She had been started on a medication, but the effects were not very clear. Consulting with her nurse practitioner, Tori acknowledged that their life had been difficult for a long time. When Machiko was a preschooler, Tori’s boyfriend was physically abusive to Tori, which Machiko witnessed. The subsequent moves, first to Tori’s parents and then out to an apartment, had been disruptive. Machiko also didn’t seem to sleep very well. The nurse practitioner had read that consistent exercise can help reverse some of the effects of emotional trauma. Tori thought exercise would be good for her own trauma as well. After changing her work schedule, she arranged for Machiko to take a long
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bike ride with her after school every day. On days when the weather was bad, they went to the gym together and competed to see who could do the most stairs on the StairMaster machine. While Machiko didn’t like this at first, Tori was able to motivate her with points for how far they rode or how many stairs climbed and make it into a game they did together. After several weeks the habits took hold and the routine was in place, and after a few months Tori noticed that Machiko was having fewer blowups and tantrums. She finished third grade, and fourth grade became a much easier year. Machiko was sleeping better, was less hyperactive, paying better attention, and now seemed to get a full benefit from the medication, which she could now take at a lower dosage. While exercise won’t always have major effects, it can reverse some epigenetic effects of trauma and also help grow the brain’s “executive function” networks that help with self-regulation. The experience of Tori and Machiko, while certainly not universal, is consistent with what the literature says can happen. There is average benefit shown in the science—which likely conceals larger benefits for some children. A bonus was that Machiko’s improved sleep was part of a virtuous cycle that had begun to replace the vicious cycle of bad days and bad sleep.

And there are more exciting possibilities on the horizon for helping children with ADHD or overall self-regulation problems. In the coming years, genetic studies will be used to understand how experience and genes work together in specific ways in large biological systems. Epigenetic tools will become important. ADHD will be one of the puzzles we’ll understand. This information in turn will tell us how to modify the genetic effect to treat or cure disease or disorder and help kids reach their potential. This won’t all be possible with today’s tools—it will take new tools, to be invented in the future, perhaps even the far future. But we can take advantage of this insight now with a fresh understanding of how the environment, including everyday events, shapes epigenetic change, brain development, and growth in children. You’ll read what we currently know about low-tech approaches to improving ADHD symptoms in the next five chapters.
In the previous chapter, I discussed general and rather abstract theories of what ‘cognitive development’ consists of and how it happens, and fundamentals proposed to apply to all types of mental activities. In this chapter, I am going to outline what we know about the development of some more specific cognitive skills. I will describe selected areas – perception, executive functions, attention, memory, metacognition and social cognition – and draw some conclusions about the developmental processes involved and how they can be facilitated. Cognitive skills explicitly represented in the curriculum – for example, in literacy and numeracy – are discussed after the chapter on language development.

It may be helpful to the reader to have in mind what I have emphasised already, that neither ‘cognition’ nor development’ is simple, and that learner characteristics and task characteristics interact.

PERCEPTION

Particularly if we don’t think carefully about it, we are inclined to suppose that ‘perception’ is simple, direct and authentic, possibly wired-in, possibly universal and probably the fundamental basis for much more abstruse cognition. There is actually a
lot of debate about all of this, amongst philosophers, physicists, zoologists and psychologists. Carefully examined, is my perception of ‘redness’ the same as yours, as a charging bull’s or as a stickleback’s? Is the ‘redness’ a property of the object? How does the ‘redness’ get from the world (if it is in the world) into my mind? What does ‘redness’ mean? It turns out that these questions are very hard to answer.

Fortunately, they are outside the scope of this book; we function in our everyday word as if they were mainly and usually unproblematic. But although we can function quite well even if we ignore these complexities, we have to be a bit careful about our evidence when we are looking at babies and very young children. I am going to make some points about the available methodologies as a way of showing how difficult it is to get this right.

METHODOLOGY IN PERCEPTUAL DEVELOPMENT

The two main groups of strategies for researching perception involve neuroscience on the one hand and behaviour on the other. A range of methods in each investigate questions such as whether an individual has detected the presence of a stimulus, say a red spot, whether he or she has detected a difference between two stimuli, say a red spot and a green spot, or whether different stimuli are categorised together; for example, are vermilion, scarlet and magenta spots seen as more like each other than they are like emerald, eau-de-nil and lime spots. Neuroscience studies focused on the central nervous system (CNS) look at anatomy, single-cell and intercell physiology, and activity over much larger regions of the brain (Johnson and Hannon 2015; Marshall 2015; Johnson 2016). Looking at anatomy to explain how perception functions has made major contributions but also gives rise to problems. For example, in young individuals the anatomical structure may be there but not working in a mature way, even not being used; or some other anatomical structure may be functioning as a ‘stand-in’ for the moment, although this may be temporary and the stand-in will be superseded by the ‘proper’ one. There is a substantial amount of research looking at individual neurons and what they react to, mainly using laboratory animals. Individual cells react to different specific aspects of stimuli; for example, in the visual system of the brain there are cells which respond to light wavelength, to direction of movement and to shape, amounting to a set of ‘maps’ of the visual field. Specific cells in the auditory regions of the brain react to speech sounds, others to musical rhythm (Johnson 2016; Marshall 2015). These specialisms are in some cases enabling the baby to learn discriminations before birth, as we see in the chapter on language, but there can be a change of specialism if that maps better on to the
stimulation that the brain actually encounters. Visually deprived kittens, for example, who never saw vertical stripes, had cells which would normally detect vertical orientations ‘convert’ to other visual discriminations. Human babies can detect many consonant discriminations early in life that they never hear, but the ability is lost because it has never been needed, with consequences for their sound discrimination given new language sounds to process. Prenatal exposure to the mother’s stress and her diet’s inadequacies affects infants’ brains with decrements in neurocognition detectable well into childhood (e.g. Monk et al. 2013) – and probably effects on behaviour too (Rijlaarsdam et al. 2017).

Other neuroscience techniques that can be used on humans involve neuroimaging over larger regions of the brain, often looking at activity and function together (Ward 2015). Measurements are becoming more and more precise, and increasingly, there are techniques available which do not distress the subject and so can ethically be used on babies and children. The baby in the picture (Bornstein et al 2016, p. 424) is wearing a ‘Geodesic Sensor Net’ used for studying the timing and stages of information processing in the brain using EEGs and evoked potentials.
Neuroscientists have also explored perception by monitoring reactions in the autonomic nervous system (ANS). Heart rate, for example, is sensitive to orienting and attention in infants and children (Bornstein, Arterberry and Mash 2016), and also to arousal and emotional state (Haley et al. 2010). Hormone levels may change according to what the baby is attending to, as we will see later; this can indicate changes in neurotransmitters in the brain. The presence of more oxytocin, as in babies’ feeding, particularly from the breast, directs the infant’s attention to faces and positive social behaviour towards the mother, which as we will see probably contributes to the developing relationship between baby and mother (Schneider 2014).

The neuroscience of perception is improving as finer-grained and less invasive methods are developed for measuring neural activity. However, although good physiological measures give very interesting results, and can help pinpoint abnormalities, the physiological measure does not always map smoothly on to the psychological level. Sometimes a stimulus presented to the sensory system creates an identifiable and even consistent pattern of electrical activity at the scalp or in a
cell, but this does not mean that the stimulus is consciously perceived, let alone meaningful to the observer. So we need to examine behaviour too.

PERCEPTUAL BEHAVIOUR

When we want to know what an adult perceives, we can try asking them to report (though they may not be accurate or honest). With infants or young children, or adults who are perceiving something where there is less useful vocabulary to describe their perception, this is less possible. Consequently, researchers observe or provoke behaviour that informs them about detection, discrimination and remembering. For example, tracking infants’ eye movements by close observation or by photographing the reflection of a stimulus on the surface of their eye has shown where the baby fixates its gaze, what scanning pattern it has, and, arguably, what it is interested in, prefers or can discriminate between. Young babies show a lot more fixations on dark/light contrast areas of visual stimuli than they do on more uniform areas and seem to have preferences between patterns and colours – concentric circles, faces and bright primary colours often being preferred (Johnson and Hannon 2015; Bornstein 2016). And there can be interesting developmental changes. For example, babies at 8 months old focused their gaze on speakers’ mouths whether the speaker was speaking the baby’s native language or a non-native language, but at 12 months focused on the speaker’s eyes when the language was the baby’s native language and on the mouth when it was the non-native one (Lewkowicz and Hansen-Tift 2012). Possibly they had learned more sound discriminations in the native language, which was addressed to them all day every day, and no longer needed so much information on mouth movements to feel they had ‘got’ the words.

Another key technique is to observe whether, when given a choice, the infant looks at (or listens to, or works harder for) one stimulus than another different one. An equal amount of time for each stimulus tells you little, but ‘preferential looking’ at one rather than the other tells you pretty securely that the infant sees a difference between the two, even if ‘preference’ in the sense of liking one more than the other might be an inference too far. This technique has been used to good purpose in many studies, notably of colour vision and pattern vision (Bornstein 2016; Johnson and Hannon 2015). An absence of preferential looking does not, however, tell you that the infant cannot discriminate; it may merely not be bothered.

In order to nudge infants into showing more actively that they can discriminate, researchers have developed other techniques, such as conditioning the baby to work to get its stimulus. If the baby will work harder to get the reward associated with one
stimulus rather than the other, that is fairly strong evidence of a preference. Another common technique involves using the phenomena of habituation and recovery. On first exposure to a stimulus, infants (and older individuals) usually orient to it and attend to it for a while, but as the stimulus is repeated, it usually generates less and less attention. This suggests that the infant has developed a mental representation which it compares with the stimulus as it recurs; if the match is perfect, there is little reason to continue to look at something that is becoming overfamiliar. At this point of low attention, the researchers make a change to the stimulus or replace it with a new one. If the infant’s attention recovers to a higher level, this suggests that the infant has registered and is interested in the difference. As we will see in the section on numbers, it can also be used to infer what the infant expected to see (Bornstein et al. 2016; Ristic and Enns 2015).

FINDINGS ABOUT PERCEPTUAL DEVELOPMENT

While the classic view was that infants perceived a ‘blooming, buzzing confusion’ (James 1890, p. 488), we now know that from birth, and in some modalities before birth, babies can detect, discriminate, remember and interpret far more than we supposed. Rudimentary function is present from the start of life – but with maturation and brain development, much of perception becomes more sophisticated, more integrated and more ‘meaningful’, and responses to what is perceived change too. I can’t cover everything about perception, so what follows are some indications of interesting research with wide developmental implications. Bornstein et al (2016), Johnson and Hannon (2015) and Ristic and Enns (2015) offer more detailed reviews.

The fetus can detect the taste of the amniotic fluid it is swimming in, preferring to gulp down sweetened fluid. Infants are more receptive at weaning to eating foods that their mothers ate during pregnancy. Breastfeeding newborns can discriminate the smell of their mothers from the smell of an unfamiliar woman (Macfarlane 1975). Infants can hear throughout the range of frequencies that adults can hear, with higher sensitivity to low and high frequencies (adults lose the ability to hear high frequency sounds such as bats’ squeaks). Newborns can discriminate between normal speech sounds, altered ones and non-speech sounds, preferring the normal speech sounds. They can discriminate at birth between the language they have heard their mother speak before their births and between their mother’s voice and an unfamiliar woman’s. Brain imaging shows the speech sounds being processed in the brain regions that process speech sounds in adults. By the middle of the first year, infants discriminate the consonants of their native language like adults, while still
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being able to discriminate between contrasted sounds from other languages (adults have typically lost this ability); and they prefer stress and pauses that make grammatical sense in the language (Johnson and Hannon 2015; Saffran et al. 2006; Stiles et al. 2015).

Human infants can taste and hear before they are born, but obviously can’t see much when in utero. Once they are out into a visually-patterned-world, they are ready to look and show preferences. They attend to faces, particularly the high contrast areas such as the eyes and the face edges; they scan edges of triangles rather than their middles; they gaze at their own hands or feet if they come into view. They are active lookers and easily engrossed by what they see. They do not, however, start life with visual acuity, depth of focus or stereoscopic vision like an adult’s; these develop over the first few months and are influenced by visual experience and in the case of stereoscopic vision by diet (e.g. Williams et al. 2001). Binocular convergence yields information about close-up distances and serves as a reliable source of information about depth by 5 months (Bornstein et al. 2016; Johnson and Hannon 2015). This is an important component of spatial perception, which is essential for moving around the world safely.

As infants become more able to sit, crawl and walk, their new motor experiences give them opportunities to use their visual knowledge in new ways. When placed next to a real or apparent drop (a real drop covered by safety glass), the infant will visually...
explore the drop, as if trying to work out whether it is safe where it is. Learning about this safety comes from visual experience and social comment, and does not need firsthand experience of falling; it does not transfer readily from an old, experienced posture to a newly acquired posture, where the new way of positioning oneself moving offers new opportunities and new risks (Adolph 2015; Adolph and Berger 2016). An infant who is experienced at sitting will avoid toppling into a gap, but as a novice at crawling or walking the infant may plunge over the edge of a drop and fall. Some infants show fear of the drop, but not all; and an infant whose heart rate is accelerated or who cries [suggesting fear] may nevertheless crawl over the edge. Infants appear to be considering the probability of falling or losing their balance (given their degree of expertise) rather than the degree to which they would be hurt by the fall.

Biological motion, the movement of living things, may be particularly salient from very early on. A key research technique here is response to a ‘point-light’ display; lights are attached to a person who moves in a dark room and is filmed so that only the lights show. Sequences of lights which were placed at the joints of moving bodies can be compared with sequences where computer modifications of light patterns are different from the display of lights on a real body. Newborns may prefer to look at computer displays of moving points of light where the lights are as they would be during the movement of the body of a normal human (Bornstein et al. 2016). This, like babies’ preference for looking at faces, will have social consequences.

Research on perception in childhood is less about what children in general can see, hear, etc. (as by the second year most perceptual skills resemble adults’ perceptual skills), and more about individual differences in perception and their implications for developmental tasks such as learning to talk or to read. These issues I will talk about when discussing the development of language, reading and so forth. But there are developmental changes in perception, as accumulated experience becomes more integrated and more strategic. Children and adults are more likely to have seen it all before, to remember previous occasions and to have a sense of what it all means. Perception becomes intertwined with cognitive processes such as memory and the deliberate controlled use of attention, and it becomes much more embedded in social relations and culture acculturated. Thus I am going to go on now to talk about attention, then memory, then metacognition. These ‘executive functions’ need to be related to discussion of attention, of memory and of metacognition. They are also social, both because we need them for socially-prescribed tasks, like becoming educated, and because we use them in our social worlds.
EXECUTIVE FUNCTIONS: ATTENTION, MEMORY AND METACOGNITION

ATTENTION

Attention is a basic executive function: it involves behaviour such as alerting to information; orienting eyes, ears or other sensory detectors; interrupting other cognitive processes; engaging cognitive resources to the task; and inhibiting return of attention to the task after it has been done or if another more important one comes up. These look like skills which are highly relevant to educational success. We might also want to know about other people’s attention, which may be relevant to cognitive development, language development, the development of social emotions and functioning well in social settings. Being able to be attentive on demand is an essential skill for success in relationships and social settings. Being able to distract oneself from an emotional difficulty or an insoluble problem may contribute to one’s emotional wellbeing and mental health. All of these attentional skills have roots in infancy and become better with practice and brain maturation. Children who are better at them do better in school, and people with brain damage, especially to the frontal lobes, and people who are ‘intellectually impaired’, tend to have problems with them. (Bornstein and Lamb 2016; Ristic and Enns 2015).

Many school tasks require persistence and accuracy over a long period of time, and so ‘he has a short attention span’ is quite a serious complaint about a child. Sustaining attention, ‘vigilance’, is known to be affected by many different factors in adults – difficulties in remaining vigilant are commonly found in adults and children with psychiatric symptoms. Sustained vigilance in the sense of attention which never omits to respond to target stimuli and never makes incorrect responses seems to be learned late, as a deliberate cold-blooded skill, and, at least in the forms which military tasks can require, needs special training. However, observations of children doing school work show that alternation of concentration with daydreaming, social chat and other activities less tightly related to the task is common. Hard work and rapid progress during concentration makes up, on most tasks, for periods of distracted or unfocused attention. (The accounts given of creative thinking [Meadows 2006] and the role of subconscious activity are similarly comforting.)

‘Low attention span’ and ‘distractibility’ have been related to neurological damage (Ristic and Enns 2015), from lead pollution for example (for a review see Meadows 2006), and also linked to ‘hyperactivity’, but physiological and psychological measures interact in complex ways. Physiological changes may cause or be caused by psychological ones, or both may be caused by some third sort of change.
Psychosocial factors are also involved, both in choice of what is voluntarily attended to, and in the strategic aspects of attention. Family interaction and communication are involved; how often child and parent both direct their attention to the same object – ‘joint attention’ – is a strong predictor of good cognitive development and good language development (Meadows 2006; Bradley and Corwyn 2002, 2005).

MEMORY

*The Basic Structure and Processes of Memory*

There are various accounts of the basic structure and processes of memory (derived mainly from work on adults), but the distinction between sensory store, short-term memory, and long-term memory (e.g. Atkinson and Shiffrin 1968) provided the classic framework. Their memory system would look something like the illustration on the next page. Information enters the system through the sensory register, and persists there for a short time after the end of stimulation, but much information never passes beyond it. If it proceeds, information then enters the short-term store and, perhaps, passes thence to the long-term memory store. At each point of entry some information may be lost, in part because sensory register and short-term store are believed to be limited in size and in how durable the information they contain is, and all three stores need time to execute basic processes. The stores use various control processes on the information they contain. For example, rehearsal, or repeating items to be remembered over and over again, is an important process in working memory where its use stops material being lost. The examination of associated information and inference contribute to the storage and recall of information in long-term memory, because such examination is associated with the semantically-based processing of information which produces a more durable and accessible memory trace. Control processes affect whether information is lost or transferred from one store to another. They also affect the organisation of information within each store, and thus are important in affecting functional capacity, since better organisation and ready transfer can transcend the stores’ limitations of size and processing speed. ‘Organising’ information, going beyond merely ‘perceiving’ it, implies the possibility of controlled and strategic cognition, and hence executive functioning. Memory models place this in ‘working memory’. The working memory model was developed first by Baddeley and Hitch (1974) and has shown itself to be a very useful model of the processing parts of memory (e.g. Baddeley 1986, 1996, 1999, 2000), with interesting implications for developmental psychology and education (e.g. Gathercole et al. 2004; Gathercole and Pickering 2000a, 2000b; for a review of memory development see Howe 2015).
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Sara Meadows

Excerpted from Understanding Child Development

CHAPTER 4

Input from outside memory

Sensory register
(small and very short-term)

Short-term store / Working memory
(limited capacity: like desk top)

Central Executive
Phonological loop
Visuo-spatial sketchpad
Episodic buffer

mnemonic activity

Long-term store
(large capacity and long-lasting: like flexible archive)

Semantic memory
Episodic memory
Autobiographical memory

Forgetting because of decay of information and loss of information from sensory register

Forgetting because of displacement and loss from short-term store: interference from similar items

Forgetting because of decay, interference and loss of strength in long-term store; consolidation of memories into generalised narrative memory; and cue use problems

The multi-store model of memory. Adapted from Atkinson and Shiffrin (1968).

Schematic diagram of the structure of working memory.
Working memory has a central executive (CE) and several ‘slave systems’, notably the phonological loop (PL), the visuo-spatial sketchpad (VSSP), and the episodic buffer. The CE regulates attention, action and problem-solving; it controls the slave systems, allocates resources between them, and mediates the relation between working memory’s short-term storage and long-term memory. The PL is specialised for dealing with language-based information; it contains a passive phonological short-term store, and an active phonological rehearsal mechanism which refreshes decaying representations. Inputs which can be recoded into phonological form can gain access to the phonological store. This is obviously important for language processing and for reading. The PL is limited in capacity, both in terms of amount of information it can hold and for how long it can hold it. The VSSP stores material in terms of its visual orspatial features; some of this information may be recoded phonologically and stored in the PL. The episodic buffer is a multidimensional representation system which integrates temporary representations from other cognitive systems.

What Develops in Memory? Organisation of Detail, Inferential Links and Memory Strategies

There is a considerable amount of evidence, both experimental and neuropsychological, for the usefulness of a multi-store model. The basic structures appear to be up and running in children at the beginning of the school years or slightly earlier (Meadows 2006). They probably do not change much in capacity or speed of processing, but there are some developmental changes in memory processes. For example, children’s selection of information improves during the school years (Rueda et al. 2004; Schul et al. 2003), becoming faster, more accurate and more efficient. Children remember more about complex information than babies do, and for longer (Bauer et al. 2000, 2002; Fivush and Nelson 2004; Nelson and Fivush 2004; Howe 2015). But even young babies can show signs of remembering an interesting event, as we will see shortly.

Preschool children recognise pictures of simple objects about as well as adults but do less well on recognising pictures of complex scenes, where adults can make more use of their interpretations of the meaning of the scene and are more likely to examine it thoroughly; that is, strategies can make a marked difference to performance.

Recognition and learning also seem to be basic processes that are present from very early in life and are refined by experience rather than changing radically. Gathercole and Pickering (2000a, 2000b) linked differences in working memory with differences in cognitive performance, including reading.

There are marked changes in the use of deliberate memory strategies as children grow older (Howe 2015; Meadows 2006). Young children engage in deliberate controlled mental
or behavioural activities to improve memory much less than older ones, and even if they try to they are typically much less efficient (and benefit less). For example, where older children and adults would repeat material, such as a telephone number or the words they have to speak in a play, over and over to themselves, under the age of about 7 there is little rehearsal, and what there is tends to be rudimentary and inefficient; for example, repetition of isolated items or only part of what is required. Older children and adults are more likely to rehearse several items and to adapt their rehearsal strategy to the particular demands of the task; for example, giving more rehearsal time to items they have not yet remembered adequately and less to material that has already been memorised. Subtle improvements such as this contribute to a steady improvement in memory performance over childhood, and indeed an improvement in the efficiency of the rehearsal behaviour (Roebers et al. 2014; Spiess et al. 2016; Howe 2015).

A similar result is found with the organisation of material. It is frequently helpful to the learner to reorganise material into categories and rehearse categorised material as such, using the information about what categories were included to summon up and recognise the actual instances involved. If we notice that four words in the list were animals, for example, we can use ‘animal names’ as a cue to help us remember whether ‘cat’, ‘pig’, ‘fly’ and so forth were in the list. Young children are less likely to divide a list according to stable and helpful categories, or to search categories systematically. They are also less likely to use helpful elaboration techniques. These create a connection between the items to be learned by, for example, juxtaposing them in a vivid visual or verbal image, associating them with an already learned string of items or some other memorable structure such as rhyme or a tune. ‘One, two, buckle my shoe’ does this job for number words (or alternatively for the items which rhyme with the overlearned number list). These strategies too are rarely spontaneously used until quite late in childhood, and are more often found in schooled than unschooled cultures (Cowan 1997; Schneider and Pressley 1989; Bjorklund 2012; Howe 2015; Spiess et al. 2016).

Why do young children rarely show a use of memory strategies? Maybe they are incapable of effectively regulating their behaviour through internal mental processes? No; there is a considerable amount of evidence that children can be trained to use memory strategies such as rehearsal, categorisation and cue-based search (e.g. Cowan 1997; Bjorklund 2012; Schneider et al. 2004; Howe 2015). Even children as young as 6 or 7 have shown themselves perfectly able to use the mnemonic strategy they had been trained in while the experimenter required them to use it. However, strategy use is sometimes not so effective in the hands of trained young children as it is for older children. They may not use the strategy that they’ve learned after the
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CHAPTER 4

intervention, when not explicitly instructed to use it (a ‘utilisation’ deficit). They also use their strategies less flexibly, less often adjusting them to the task in hand (a ‘production’ deficit). These problems may owe something to poor knowledge about memory problems and how to transcend them – deficits in ‘metamemory’.

The second point I want to make about memory strategies is that, although strategic effort to remember is not often seen in the performance of young children, it is very evident that young children can and do remember. Improvements in the use of strategies probably account for many of the developmental changes in memory performance during the school years, but babies’ and preschoolers’ memories may be impressively accurate. Rovee-Collier (Rovee-Collier and Hayne 1987; Rovee-Collier and Cuevas 2009; Rovee-Collier 1997) showed that infants as young as 3 months remembered how to move mobiles suspended over their cots for as long as eight days, and older infants proportionately longer. Other research from this group deserves attention (e.g. Roebers, C. et al. 2014; Spiess et al. 2016; Cuevas et al. 2016; Rovee-Collier and Giles 2010; Hayne et al. 2000).

We do not know how these children remembered; presumably they did not consciously and deliberately set out to memorise, but behaviour such as repeatedly...
requesting recitations or namings may facilitate recollection – rehearsal with the parent as the stand-in who does the work for the child! Salient events may also be remembered: my own daughter, for example, recalled at the age of 20 months a unique sight from two months earlier. She had first visited my sister’s house just before she was 18 months old, and had seen balloons hanging from the curtain rail in the sitting-room (it was my sister’s birthday). We next visited the house nine weeks later. When she re-entered the sitting-room, Anne looked up at the curtain rail and said ‘balloon’. No one had mentioned those balloons to her at any time in the intervening period. Her ‘balloon’ and look upwards demonstrated a memory for an earlier feature of the room.

Metamemory

‘Metamemory’ refers to one’s knowledge of memory; that is to one’s awareness of what memory behaviour is happening at the moment; to one’s knowledge about task difficulties, one’s own skills, abilities and deficits; and to strategies that will enable one to perform a task satisfactorily. Children’s knowledge about memory clearly increases as they go through the school years. They know more stateable facts about memory and they know more memory strategies (Schneider and Bjorklund 1998; Howe 2015; Meadows 2006). Preschool children know that, all other things being equal, familiar lists are more memorable than unfamiliar, and long lists are harder than short ones. They do not appreciate that a homogeneous set of items which show a consistent relationship may be very easy to learn irrespective of its length, thus they predict that a short paired associate list where there are arbitrary pairings will be easier to learn than a longer paired associate list where all the pairs are common antonyms. By the age of 9 or 10, children (like adults) judge that the antonym list is easier to learn, and if asked to generate a list which will be ‘easy to remember’ invent one with highly related items. Preschool children know about the rapid decay of short-term memory, and they tend to agree with adults that recognition is easier than recall. It is not until the age of about 10 that they say it is harder to remember word for word than to paraphrase and ‘tell you in my own words’. These results suggest that although children have achieved some understanding of the demands of memorising by the time they enter school, they can only gauge task demands accurately after considerable further experience of memorising.

Young children frequently overestimate their memory capacity (Cavanaugh and Perlmutter 1982; Schneider 2002), and being over-confident about remembering would probably reduce the amount of special effort to remember. Young children may
only rarely have their failure made visible to them, as adults probably take much of the responsibility for remembering things. A child who goes to school, on the other hand, is having to live in two ‘microsystems’ (Bronfenbrenner and Ceci 1994; Meadows 2006), ‘at home’ and ‘at school’, which will involve both relatively spontaneous reporting of school events at home and vice versa and the deliberate carriage of information from one to the other. No longer can one caretaking adult take all the responsibility for the child’s remembering – it is only the child who inhabits both microsystems and knows all their details. What’s more, the school microsystem requires the child to memorise larger and larger quantities of information, for more formal testing, and may model mnemonic strategies and even, occasionally, discuss them.

What we remember and how we remember are inextricably tied in with our relevant knowledge. Once information has progressed beyond short-term memory it can become mixed up with information we have acquired at other times. It is (generally) much easier to remember information if we already have related information. Older children’s greater quantity of stored information might account for much of their remembering better than younger children.

**CHI’S STUDY OF CHILD CHESS PLAYERS**

Chi’s elegant experiments with chess players illustrate this particularly neatly (Chi 1978). She compared children (average age 10) with adults on two tasks: immediate recall of a string of digits, and immediate recall of stimuli placed within an eight by eight array. The adults performed better than children on the digit list, as expected; but the children remembered more about the stimuli in the eight by eight array. This unusual finding of better performance by children is explained by the fact that the children were experienced chess players and the adults were not, and the ‘stimuli placed within an eight by eight array’ were chess pieces in a mid-game position on a chessboard. This array was meaningful and thus memorable to a chess player, meaningless and difficult to someone ignorant about chess. It is worth noting that chess players did not find the array easier to remember if the pieces were put on at random, but only if they were in positions that they could legitimately have reached in the course of a genuine game.
Familiar and meaningful information can be processed faster and more strategically than the unfamiliar and meaningless. Experience and familiarity highlight the salient points, make understanding and remembering easier, and aid recall through allowing association, inference and other active reconstruction processes. Well-known information may need fewer attentional resources in working memory, and thus leave more mental working space for other items or for demanding strategies. Children, who know most pieces of information less well, have to use up more resources on remembering each piece and would thus both remember fewer items and be less able to work through a complex memory strategy. There may be some minor costs, however, particularly in the form of more errors in recall due to implied information being inferred and so judged to have been explicitly presented (Meadows 2006; Howe 2015). Memory is normally holistic and inferential, and, while in most cases this is advantageous, it can contribute to errors and distortions of information.

Infantile Amnesia, Episodic Memory and Autobiographical Memory

It is rare to remember anything about the period of one’s life before one’s third birthday, and there are comparatively thin recollections of the period from ages 3 to 5. This is the phenomenon which Freud (1973, 1977) called ‘infantile amnesia’; he attributed it to repression of the unacceptable sexual and aggressive impulses of early childhood; that is, to a later blocking of memories with too strong an emotional tone. However, the emotions which accompany memories of early childhood are very similar to those accompanying memories of other periods of life (Meadows 2006).

Emotions affect memory at all ages. Failure to encode data to be memorised remains one possible source of childhood amnesia, but there is extensive evidence of data being registered, retained for some time, and recalled. Toddlers often chatter about events. Specific cues from adults may elicit more information and check accuracy. Young children’s ‘poor memory’ may involve communication difficulties such that adults don’t give them credit for what they have remembered.
ISSUES OVER COMMUNICATING ONE’S MEMORIES TO ANOTHER

When she was about 3, my daughter tried to tell me about the videotape she wanted to watch. She initially listed the following distinctive features: ‘He’s in the snow, there’s a monster, there’s a robber lady’. I considered these cues, and offered The Snow Queen which has snow, robbers and some odd if not monstrous characters; this was turned down. So were Toad’s Winter Sports (snow, wicked weasels who steal Toad’s snow goggles) and The Snowman (snow but no other relevant features). These were very firmly rejected, and a further cue offered: ‘the robber lady steals some bananas’. I am afraid my reaction was ‘we haven’t got a tape like that, you’ve got it mixed up’, and her reaction to this insult was so strong that to re-establish good relations we had to look at every tape in her collection and identify what was in it. This exhaustive search produced what she wanted. We had a tape on which two Charlie Chaplin films were recorded: The Gold Rush (he’s in the snow, there’s a monster in the shape of wicked prospectors in enveloping furs threatening the little tramp’s life), and Modern Times (the waif or ‘robber lady’ steals bananas to feed her orphaned sibs). Anne’s memories of the tape were correct, but her expression of them was fragmentary and her headings were not accessible to an adult, who was in any case operating on the assumption that the headings might be slightly wrong, an assumption probably all too commonly made by adults.

Nelson (1986) suggested that children have difficulties with narrative memory for individual episodes because they automatically build up ‘General Event Representations’ (GERs) in which repetitions of the same type of event are fused into a generalised schema or script. Young children can re-enact a game learned two weeks earlier better than they can describe it in words (e.g. Bauer et al. 2000). The GER built up from the repeated invariants in episodes will increasingly dominate the specific and idiosyncratic parts of the particular experience.

Children’s discussion of events in their lives often occurs in conversation with family members (Bauer et al 2002; Nelson and Fivush 2004). This conversational remembering builds up a socially addressable memory system which is used when an intentional, purposeful search of memory and a narrative-like recall are required. When we remember such events or images as adults, they may become overlaid with information from later memories and later-developed skills. Probably a lot of our adult memories involve composites of events and narratives. This is heavily influenced by the social and culturally-influenced parenting practices that surround the child. The immaturity of the
very young child’s self-concept may contribute to the sparseness of their early autobiographical memories, and autobiographical memories will contribute to the development of the self-concept (Bigler 2015; Howe 2015; Reese 2002; Dweck 1999).

If an individual’s autobiographical memory, or a social group’s, is different from that of the majority culture, the discrepancy may endanger their participation in the wider culture, as in the ethnographical studies of Heath (1983, 1986, 1989, 2004). It may be that children’s autobiographical memories differ according to their social experience. Valentino et al. (2009), for example, found a risk of over-generalised memories in maltreated children, and more negative self-representations.

Autobiographical memory is inextricably social, cultural, historic, related to one’s self-concept and emotionally-loaded. Nelson and Fivush (2004, pp. 576–577) say that autobiographical memories of specific events allow individuals to create a shared past with others from which an individual personal past emerges. The human ability to create a shared past allows each individual to enter a community, or culture, in which individuals share a perspective on the kinds of events that make a life and shape a self. [...] In some cultures, and to some extent in all, these functions may be served by shared cultural narratives, whereas in others (such as the contemporary western culture), more may depend on the individual’s self-definition and self story.

METACOGNITION

As well as knowing about our memory performance, we know a certain amount about other aspects of cognition; hence psychologists have researched metacognition—feelings of understanding or not understanding, of remembering or forgetting, at a particular moment; knowledge about one’s own cognitive skills and about a task’s difficulties (‘I won’t be able to do this because I can’t remember how to do square roots’); and regulation of cognition, for example planning how to do a task, monitoring progress on it, checking the solution.

Metacognition is related to intelligence, giftedness, memory, reading, reasoning, communication, mathematical problem solving and other areas (Kuhn 2003; Meadows 2006; Muller and Kerns 2015). The concept of a central executive system which is metacognitive in that it controls cognitive processes has been a powerful
metaphor for information-processing psychologists. Piaget emphasised that the child’s metacognitive awareness of contradiction between two schemes of thought is crucial for cognitive development. Both these schools of thought say that autonomous regulation of thought, automatic small adjustments of actions, is inherent in cognitive activity; conscious reflection on thought is a later achievement. Awareness of the intended outcome and discrepancies from it comes much earlier than awareness of what exactly is wrong, and knowing what to do about it may be later still.

IF YOU WANT TO GET AHEAD, GET A THEORY

Experiments by Karmiloff-Smith and Inhelder (1974/5) see also Karmiloff-Smith 1992) illustrate this. They gave 4- to 9-year-olds the task of balancing blocks of wood on a narrow bar. The simplest strategy was to use physical trial and error, nudging the blocks on to the balancing point: slow but eventually successful. This strategy was, however, supplanted by simple theories which worked for some blocks but not for others; for example, to balance the block by the geometric centre, which was successful for uniform blocks but not for ones with an uneven distribution of weight. These blocks that did not fit the theory gave rise to an alternative theory, so the child operated two juxtaposed theories without co-ordinating them. Constructing a higher-level procedure, which combined the simpler theories and left no exceptions, was slow and painful in that it gave rise to more errors as it was developed than its predecessors had done. Simple theories applied perfectly to a limited set of blocks: those blocks the theory couldn’t cover were rejected as ‘impossible to balance’, until there were an intolerably large number of exceptions.

Philosophers of science have observed a similar reluctance in professional scientists to take on board the accumulating instances which the present theory cannot incorporate (Kuhn 1962).

Another source of metacognitive conflict, which Piaget (and some philosophers of science) emphasised, is disagreement with peers. Doise and Mugny (1984) worked with pairs of children who were required to reach agreement on a task organised so that they are likely to begin by giving contradictory answers. For example, in a conservation of length task, each child might judge the stick that came nearer to himself or herself to be longer than the one nearer the other child: thus their two judgements are contradictory, since it cannot be the case that both sticks are ‘longer’. (In fact, of course, in the standard conservation test both children are wrong as the sticks are identical in length.) Intra-individual conflict, confronting the child
with a previous contradictory answer, can also induce metacognitive progress (Emler and Valiant 1982). Various educational programmes teaching scientific thinking employ group work and its potential for metacognitive conflict.

However, it has to be stressed that awareness of conflict is not quite the same as awareness of contradiction, and knowing how to resolve the disagreement is something else again. There is some evidence that young children treat judgements of size as being much like judgements of preference: ‘You think this one’s more, I think that one’s more’ is regarded as the same sort of situation as ‘You like this one, I like that one’ (Russell 1981a, 1981b, 1982). Children who have some understanding of the physical principles of Piagetian tasks such as conservation are less likely to make this sort of mistake. Children may not be terribly good at reporting text comprehension problems but they do show some behavioural indices of comprehension monitoring, such as pausing and frowning.

Another body of information comes from studies of verbal communication. If young children are given an ambiguous message, they tend to act on such messages with great confidence that they have understood what was meant; when things go wrong they are likely to say it was the listener’s fault for not listening properly. Older children, like adults, blame the speaker for giving an imprecise message, and say that more exact information should have been given. It seems likely that this can be related to the ecology of the small child’s life; many children get given listener-blamer messages ‘you haven’t listened’, ‘now listen carefully’, and so forth.

How should we describe the differences between the young child who does not use a metacognitive strategy and the older child who does? One possible description is the novice-expert dimension. Novices lack the necessary skills for a task and probably also an adequate ‘feel’ for the task as a whole. As managing the component parts of the task takes up all the available processing space in the early stages, there is little opportunity for metacognitive activity such as deliberate self-regulation. As the task parts become more familiar and take their places in the whole task, there will be more space for metacognition, and the learner can step back, consider the way the entire problem is going and make his or her performance more systematic and better organised. Children will constantly be novices on tasks where adults have become experts with many more well-learned routines.

It seems likely, however, that adults will not just have learned many routines well enough to find it easy to perform the routines and to think about them; they may also have developed more generalised metacognitive skills which they can transfer flexibly from
task to task. Thus, although the specifics of a task may be equally new to child and adult, the latter may both have a better sense of what sort of task this is, more knowledge of his or her own capabilities and more general routines for controlling his or her performance.

Piaget emphasised contradiction with peers as a means to cognitive progress and said that contradiction experiences with adults would not lead to the child re-thinking (because of the power imbalance between adults and child). Hence his much-quoted aphorism:

> Remember also that each time one prematurely teaches a child something he could have discovered for himself, that child is kept from inventing it and consequently from understanding it completely.

[Piaget 1983, p. 175]

**TEACHING THINKING SKILLS**

However, there have been many successful attempts to teach children strategic thinking skills and to improve their metacognition [for a review, see Meadows 2010, Chapter 6].

**BEING A GOOD THINKER: THE TOOL BOX AND THE TASKS**

The good thinker needs

- resources of intelligence and working memory
- a good repertoire of strategies to choose from and apply appropriately and flexibly
- knowledge of the cultural tools of thought that are available
- an extensive base of declarative knowledge which is accessible and helpfully-represented
- a high degree of metacognitive knowledge and reflective awareness
- a confident attitude to cognitive tasks; to be able to cope with uncertainty and ambiguity; ability to take alternative perspectives and handle counterfactuals; willingness to accept cognitive challenges; to extrapolate from the familiar to the unfamiliar; to be persistent, take risks and go ‘beyond the information given’; make mistakes and learn from them; to succeed and not take success for granted but be able soberly to identify its sources
- a medium to communicate it with; probably, but not necessarily, language
The tasks in good thinking include

- diagnosing situations
- searching for, finding and weighing evidence
- analyzing implications
- identifying assumptions
- establishing and evaluating beliefs
- constructing and evaluating arguments and counterarguments
- judging probability and plausibility
- making inferences or drawing conclusions

How do children develop these skills and this knowledge? Can they be taught? Many children discover or invent strategies themselves through unaided exploration of the world or with an adult as background facilitator – this is what Piaget regarded as genuine cognitive development. But their strategies often contain mistakes, are based on observing other people (Saxe et al. 1987), or are weaker than strategies already invented by someone else.

Children also learn from observing other people and imitating them. Efficient observational learning requires a comparatively clear model, time to observe it and, in many cases, prior ability to understand and carry out at least some components of the model’s behaviour. Modelling with commentary is obviously a component of Vygotskian ways of teaching thinking, and of parental framing. Peers and siblings might also be effective models (Anderson et al. 2001; Maynard 2002; Wigfield et al. 2015). Imitation, however, can be slavish, and not allow independent development to improve on the model.

Teachers often tell learners things, lead them over and over again through the activity they have to learn, correct their errors as they take each small step and generally shape their behaviour. This sort of instruction can be very effective: if the learner goes through the exercises enough times the cognitive processing becomes habitual – practice makes perfect. The danger is that practice may make you set in your ways, prevent you, as Piaget pointed out, from understanding how a strategy works and how it may be modified and applied to new tasks, or from inventing a new strategy which might be better than the taught one. Using the strategy on a gradually widening range of examples, including explanations of how the strategy works and demonstrating that it is ‘cost-effective’ help ensure the strategy continues to be used.
The more that a learner knows about a strategy the more likely it is to be transferred appropriately to other tasks (Meadows 2006).

The neo-Vygotskian account of cognitive development emphasises that thought develops through social interaction. The more expert partner ‘scaffolds’ the child through the task to be carried out, doing the parts the child cannot do and arranging the situation so that the child can take his or her part. The child’s attention is directed to relevant features of the task; appropriate actions and strategies are suggested; and highlighted feedback on the child’s actions is provided. Expert and novice take turns to carry out the steps of the task, with responsibility for its execution gradually shifting from expert to novice; the strategies needed for the task are modelled, overtly, again and again, and the child practices them again and again; the expert gives the novice a little more independence after a successful action, and a little more support if there has been a failure or difficulty. The child is helped to progress through the ‘zone of proximal development’. But outside school, most scaffolding proceeds almost unnoticed as the child and the more expert partner play together – the ‘scaffolding’ happens as an unnoticed component of joint activity, where the goal is to make dinner together, choose wrapping paper, or find the missing sock. Work on language development contains many examples.

Dweck (1999) provides an interesting argument about the motivating effects of different forms of feedback, and their impact on self-concepts. She identifies a syndrome combining high achievement on familiar tasks and high fear of failure, which prevents the person from taking cognitive risks and from recovering resiliently from any lapses in performance. These individuals are willing to do what they know they can already do, but will not try new challenges and are thoroughly demoralised by difficulties. She suggests that a significant cause of this is feedback which led the individual to see success as a sign of their ability, and failure as a catastrophic indication that they were not so able as they had thought. When the feedback is in terms such as ‘you are clever’, ‘you are so good at art/science/running/making pastry’, then the implication of the occasion when there is a failure is felt to be that ‘really you are not so clever/good at it after all’; while if the feedback has been ‘you did that really well’, ‘that was elegantly expressed’, ‘that is a new way of thinking about it’, ‘that would be even better if you had baked it a minute longer’, then the implication of failure rather than success can be merely ‘you didn’t do that so well this time’, which implies more possibility of improvement.

Willingness to take on reasonable challenges is essential for educational success; people who try maybe won’t succeed, but those who refuse to try are guaranteed not...
THE DEVELOPMENT OF COGNITIVE SKILLS
Sara Meadows

Excerpted from Understanding Child Development

CHAPTER 4

to succeed. Dweck therefore recommends praise should centre on the excellence with which the task was done, rather than on the intrinsic merit of the performer, and cites some evidence that this is more likely to encourage people to take on cognitive challenge. Thompson (2004) makes a similar argument. Bandura’s notion of ‘self-efficacy’ and Seligman’s of depression as ‘learned helplessness’ ally this description to personality and motivation (Bandura 1981, 1997; Rosenhan and Seligman 1995; Seligman 1975). Even the best ways of ‘teaching thinking’ may founder if the learners’ concepts of themselves as learners get in the way.

SOCIAL COGNITION

I have been arguing that a lot of even basic cognitive skills is developed through a social context. But the complement to this is to ask how children understand other people – do they understand how people are different from inanimate objects, for example? Do they know that other people have psychological states and that these may not be the same as their own? Do they have a ‘theory of mind’? For a review of such issues, see Hughes and Devine (2015).

Human infants, highly dependent on their caretakers, are strongly oriented towards them, as we have seen. This preferential attention and associated emotional displays make the infant attractive to adults and consequently provide opportunities for observing and learning from adults (Olson and Dweck 2009; Carpendale and Lewis 2015). Out of observing people’s actions there develops a sense of people working towards goals, and a belief in their intentionality, that is that they have mental states directed towards the outside world. Joint attention with adults, collaboration with others, and emotion-sharing also feed into this mentalising. Having your own goals and intentions take into account the goals and intentions of others becomes a key development of social cognition.

DIAGNOSING MENTAL STATES

Toddlers, as they begin to speak, use mental state terms such as ‘happy’ or ‘thirsty’ and may act appropriately in some ways; for example, giving an adult the food the adult has said they liked even if the children themselves disliked it. This sort of understanding seems to be easiest for very young children in ‘pretend’, which flourishes from the second year onwards (e.g. Leslie 1987, 1988; Lillard 2001, 2002; Taylor 1997, 1999; Taylor et al. 2004), when ‘desires’ are the focus (Wellman et al. 2001, Wellman 2002), or when the representation is clearly subjective (for example
3-year-olds are said to understand that cats think cat food tastes ‘yummy’ even though they themselves think it tastes ‘yukky’.

PRETENDING CAN AFFECT YOUR PERCEPTION OF REALITY

Even a mental event that you know is not real may affect your reaction to the real world. Harris et al. (1991) asked children to imagine that there was either a monster or a bunny rabbit in a box which they knew was really empty; the pretend being over, they were then asked to put their hand in the box. Children who had just imagined that the box contained a monster were much more reluctant to put their hand in, so they may have believed that their pretence had caused a real monster to be in the box; alternatively, they may have been carrying on the pretence (see also Taylor 1997, 1999; Taylor et al. 2004). Children’s pretence, while delightful, is complicated and may make research designs problematic.

A substantial body of work has now been done using false belief paradigms of various sorts (Meadows 2006; Carpendale and Lewis 2015; Bigler 2015). Young children may have a difficulty in admitting alternative mental representations, or perhaps in inhibiting the most obvious representation in favour of a more difficult one. They have a problem in understanding that beliefs involve representations, and how their representations relate to reality. This might be linked to immaturity of brain systems needed for executive control, or to the immaturity of their self-awareness. This is a capacity which is deficient in autism (Baron-Cohen 1995; Hobson 2002). Baron-Cohen refers to all this as mindblindness, an inability to ‘read minds’.

Interestingly, normally-developing (‘neurotypical’) young children tend to attribute feelings and desires to animated geometric shapes, while children later diagnosed with autism do not over-attribute human feelings in the same way (Pennington 2015; Bartsch 2002; Strauss et al. 2002; Peterson 2002; Hobson 2002; Hill and Frith 2003; Frith and Frith 2003).

THE FALSE BELIEF TASK

Understanding that someone can believe something that the child knows is not true – that is, people may have false beliefs – is harder. In one standard scenario, two dolls (Sally and Ann) watch as a treat is hidden in a specific location. Sally then leaves the room. Ann now moves the treat from the original hiding place to a new one, and leaves. The question is, when Sally returns, where will she look to retrieve the treat? Before
about age 4, children consistently say that Sally will look for it where it now is, apparently failing to understand that Sally does not possess the new knowledge that the hiding place was changed (Wellman et al. 2001). After 4 years of age, most children realise that Sally has a false belief, and they say she will look for it where she last saw it. In another scenario, a box that is labelled ‘sweets’ is found to contain pencils: young children predict that a naïve observer seeing the box will believe it contains pencils, because they themselves know that it does actually have pencils in it, not the sweets shown on its outside. Older children make more of a distinction between what they know and what the situation looks like, and give correct answers to such questions.

Understanding that people may have beliefs that are different from one’s own, and in particular can have false beliefs, makes bluff (and double bluff and all sorts of higher order games of deception) possible. There may be a repeated cycle of three stages of recognising and using alternative mental representations, first in visual perspective taking, then in knowing about other people’s knowledge, then in higher order knowledge attribution (‘John kicks Mary because John knows that Mary does not know that the teacher has arrived, and he wants her to know about it so he gives her a kick’). People with autism seem to have particular problems with understanding people’s ‘indirect’ social behaviour (Baron-Cohen et al. 2013; Hill and Frith 2003; Hobson 2002; Peterson 2002; Saxe et al. 2004).

Complete understanding that there may be different mental representations of the same object or event and that these may be equally ‘valid’ is undoubtedly a very sophisticated achievement indeed (and probably a fragile one, given how often we may fail to appreciate someone else’s point of view). It is embedded in the language and social context of cognition; it may be linked to impersonation and having imaginary friends (Taylor et al. 2004). It is an essential component of the skills needed for living with other people (Dunbar 2014), with great importance throughout evolution; and hence there may be regions of brain specialised for theory of mind processing (Frith and Frith 2003; Saxe et al. 2004).

Adults’ discussion, especially mothers’ discussion, of people’s beliefs, desires and understanding is associated with individual differences in children’s understanding of mental states; mothers whose conversation is full of ‘mind-mindedness’ [Meins et al. 2002; Meins 2013; Peterson and Slaughter 2003] tend to have children with advanced theory of mind skills. A relative lack of this might account for some proportion of the difficulties of deaf and autistic children.
There are other ways of having incorrect ideas about others’ mental lives. In two early books, *The Child’s Conception of the World* (1929) and *The Child’s Conception of Physical Causality* (1930), Piaget suggested that young children, as well as being egocentric, were animistic and had difficulty discriminating between the physical and the psychological; for example, they claimed that their own view was what other people could see, that dreams were external images which could be seen by people other than the dreamer, and that the sun, the wind and other natural objects were alive and conscious and followed them around. Following up these Piagetian interview findings, researchers (for example Keil 1981; Wellman and Estes 1986), investigated whether young children distinguished between mental events or objects, such as a dreamed of or imagined dog, and real ones, such as a real dog. Wellman and Estes found that even 3-year-olds could make a better than chance judgement of which of the ‘real’ and ‘mental’ pair could be touched, seen by others, and which existed consistently over time, thus showing they appreciated three of the main criteria necessary for distinguishing between the real and the mental. Children also knew that you could dream about or imagine but not really see or touch an object which is physically impossible or non-existent, such as a dog with fiery eyes as big as windmills. Thus, the preschool children in this study were not Piagetian ‘realists’, claiming that dreams and thoughts have a concrete and public existence.

### DIAGONOSING CHILDREN’S UNDERSTANDING OF MISLEADING APPEARANCES

Another line taken in research is about the distinction between appearance and reality. In a typical study children were shown (by sight then by feel) a sponge that looks like a rock (or a candle shaped like an apple or a white shape behind a coloured cellophane filter) (Flavell 1986; Flavell et al. 1986). At various points in the procedure they are asked questions like ‘When you look at this with your eyes right now, does it look like a rock or does it look like a sponge?’ (the appearance question), or ‘What is this really and truly – is it really and truly a sponge or is it really and truly a rock?’ (the reality question). Adults and older children reply that it looks like a rock but it really and truly is a sponge. They also know that someone who has only seen the sponge, not touched it, would say it was a rock, being deceived by its misleading appearance. Thus they appear to have two different ‘mental representations’ of the object, one of what it ‘looks like’ and another of what it ‘really is’.

Children under 4 tend to give the same answer to questions about appearance and about reality, so that they answer ‘rock’ or ‘sponge’ to both questions, and to say they always
said what they are saying now. Flavell interprets this as an inability to realise that the same object can be represented in different, seemingly contradictory, ways. But when the question is asked in the context of trying to deceive someone, or when the child is asked what the ambiguous object could be used for, children are much more likely to give an adult answer (Peskin and Ardino 2003).

There is also work on children’s judgements of other people’s visual perspectives, starting with the views of observers located at different points in a landscape of model mountains (Piaget and Inhelder 1956; Meadows 2006). Piaget and Inhelder’s youngest subjects tended to choose a picture showing their own view irrespective of whether the viewpoint currently in question was their own or not. More recent studies, however, have shown the ‘egocentric’ error to be less common than Piaget described it and to be attributable in some degree to the difficulty of his task. If simpler materials are used, or ‘meaningful’ ones such as a ‘naughty boy’ doll hiding from a policeman doll (Hughes and Donaldson 1979), children have little difficulty in distinguishing someone else’s view from their own.

Beginning in infancy children come to understand a great deal about what a person can see. They use the other person’s direction of gaze to work out what they are looking at from very early indeed; they can use verbal clues to distinguish between different sorts of objects and events (Carpenter et al. 1998; Tomasello and Haberl 2003). They know that in order to see an object at least one of the observer’s eyes must be open, and aimed in the direction of the object, while no other large opaque object comes between the observed and the observer. They understand about hiding objects. They also know that what they themselves see is irrelevant to what another person sees. They can use this knowledge to enable an observer to see something, or to prevent this, as well as for their own diagnostic purposes. By 4 to 5 they have the idea of how to play hide-and-seek (Peskin and Ardino 2003), even if they may still be inefficient in how they hide. They are thus not egocentric in at least some of their assessment and use of other people’s vision. Children as young as 3 have learned a great deal about how people (themselves and others) can be ‘cognitively connected’ to the external world. They have learned, for example, that cognitive connections (such as seeing something) can change over time, are largely independent of other cognitive connections, are independent of other people’s cognitive connections, and can entail other, subjective, experiences.
MORAL REASONING

CHILDREN’S MORAL REASONING

In what senses are children ‘moral beings’? At what ages do they begin to reason about moral issues? What ideas do they have about what is right and what is wrong, and why? Is ‘moral development’ powered by forces inside the individual or is it largely social and a result of upbringing? Questions like these have framed a lot of research on children’s moral reasoning. There is too much to cover thoroughly, and a lot of disagreement between theorists, but I am going to address three main points: the adequacy of the cognitive-developmental model of moral reasoning developed by Piaget and Kohlberg; children’s views on the relations between convention and morality; and the importance of emotion and empathy in moral action. For a general review of moral development I recommend Turiel (2015), Killen and Smetana (2015) and Nucci (2002).

The field of moral development has been dominated by a model of morality that emphasised its rationality and to some degree separated it from emotional content.
This model began with Piaget (1932) and was developed by Kohlberg (1984). It involved a succession of stages of moral reasoning in which notions of justice and rights were central. Developmentally, moral judgment started from early stages in which children’s self-interest and their knowledge of social norms dominated their choice of what was ‘right’ or ‘wrong’ and their justifications of their choice, and gradually reached later stages in which principles of moral justice replaced self-interest and convention as the core of moral reasoning. The developmental forces include changes in relationships with parents and peers (especially for Piaget), and an intrinsic drive for coherence and commitment to a key moral principle (Kohlberg). Both researchers used stories about moral dilemmas as a major way to elicit evidence, though Piaget’s account also uses charming examples of his own children’s response to their moral dilemmas and of children playing games like marbles.

Asking children to comment on hypothetical moral dilemmas is a well-used method, but not without problems. For example, does discussion of fictional dilemmas reflect their real-life moral reasoning? Can children remember all the quite complex information in the stories? Is the categorisation of children’s answers reliable? Can children express their reasoning fluently? Are the stages so clear-cut, so coherent, and so sequential? Critics have disagreed with the depiction of young children as amoral (and of many adults as falling far below the final stages of Kohlberg’s sequence); they have questioned whether people show consistent levels of reasoning across topics or occasions; they have identified lapses between reasoning and action; and they have disputed whether valuing justice and respect for human life above all else was the only tenable highest stage of moral reasoning (Gilligan 1982; Nucci 2002, 2004; Turiel 2015). One of the relevant issues is children’s recognition of the moral and the conventional as related, but not identical, domains.

Table 5.1, adapted from Nucci, shows Kohlberg’s stages in parallel with the characteristics of children’s moral reasoning and understanding of convention. Several researchers have demonstrated that children as young as 3 differentiate between convention and morality, seeing convention as contextually dependent and agreed-upon social rules, and morality as less arbitrary, less avoidable and appealing to universal moral principles (Turiel 1983, 1998, 2015; Nucci and Turiel 2009; Killen and Smetana 2015; Smetana et al. 1984). Thus they would agree that although one should participate in ‘show and tell’ at one’s nursery school, this was merely because not participating and not abiding by the nursery’s conventions would upset social expectations, and it might be quite permissible to keep out of ‘show and tell’ in ‘another country’ or ‘another planet’; but they would assert that to wreak unprompted
harm on someone would be wrong everywhere, regardless of whether it had been specifically prohibited. Compliance with convention comes to be seen as a good thing if it increases social harmony but as problematic if the conventional norms transgress a principle of moral authority or fairness. Similarly, a study by Lagatutta and colleagues (Lagatutta et al. 2007) asked children aged 4, 5 or 7 whether the protagonist of a picture story should comply with their mother’s prohibition when the action that was prohibited was essential to the protagonist’s identity [something they did every day which made them feel really good], enjoyed by the protagonist but not at the core of identity [something they did sometimes which just made them feel ‘okay’], or breached a moral rule (for example, stealing, grabbing or hitting). Even 4-year-olds showed some insight that prohibitions based on moral rules should be obeyed and that obeying the prohibition of an action core to one’s identity would be
hardest, with such distinctions increasing in older children. Moral-rule situations, and older children, also produced more morally evaluative explanations.

Having to balance potential good and potential harm when making moral judgments is not straightforward. There may be conflicting goods and harms, as in the Lagatutta study of reinforcing a valued personal identity vs. compliance with your mother [and retaining her approval]. It may be difficult to see the link between action and harm embedded in a social context; for example, the link between breaking a moral rule (say by deliberately shooting someone) and harm to someone is typically immediate and obvious, the link between a social rule (the right to bear arms) and harm to other people (as indexed by the homicide rate) is less immediate, and much more arguable. In this sort of predicament, individuals have different views, and may have to choose between conventional and post-conventional (principled) moral reasoning; Emler (1998) finds this choice to be linked to political affiliation, with more left-wing people tending to appeal to moral principles and more right-wing people tending to appeal to social convention or outside authority. Another area of debate has been over the possibility that different groups have different bases for their moral reasoning. Following critiques of Kohlberg’s model after his suggestion that women were less likely to reach higher stages of moral development than men, Gilligan (1982) suggested that the problem was Kohlberg’s prioritising of justice as the core principle of moral judgement. She proposed compassion as an alternative, and linked a feminine preference for compassion to socialisation into sex roles. More recent studies (Jaffee and Hyde 2000; Lapsley and Narvaez 2004) show that both males and females reason about both justice and compassion, though with a small gender bias in orientation. Again, the justice and compassion might be hoped to go together, rather than the one win out over the other; but here too, there might be conflicts, with compassion suggesting one course of action and justice another.

Cultural differences are an even more difficult issue. Some theorists emphasise the ways in which individuals’ moral reasoning is constrained and constituted by the socially constructed norms that they meet, with cultural emphasis on individuality or on community (or collectivity) or on ‘honour’ and maintaining ‘face’ being one developmentally powerful dimension, (e.g. Shweder et al. 1990; Oyserman 2017); others see these as superficial differences which conceal universal obligatory moral values. Again, it may be more a matter of what is prioritised rather than what is possible. Children growing up in a highly collectivised society may still feel free to think that they should have a set of values which are personal, private and autonomous (Nucci 2002); and children in a highly individualistic society may nevertheless be desperately anxious
to espouse the values of the society and so ‘belong’ to the desired social group (Power 2004; Wren and Mendoza 2004; Keller 2004).

Individuals who belong to a minority subculture within a dominant culture may differ in their values from the majority, sometimes in very painful ways. Verkuyten and Slooter (2008), for example, asked 12 to 18-year-olds in the Netherlands to indicate their views about issues such as free speech (whether it is permissible to ridicule religion, express racist views, or call for war between Muslims and non-believers), Muslim minority rights (for example, to found separate schools or burn flags in a demonstration or protest), and practices based on minority cultural beliefs (such as women wearing a headscarf or female circumcision). They found that all individuals endorsed moral principles of fairness and tolerance of minority rights, but they were not completely consistent across issues. Both Muslim and non-Muslim adolescents were less willing to tolerate action which contravened these values if the perpetrator was from the group they did not themselves belong to, or if the action would negatively affect people like them. This applied also within ethnic groups: the young Muslim women were more hostile to female circumcision than any other group, while young Muslim males were the most in favour of male control of women.

Apart from cultural differences in what is acceptable morality, there may be cultural differences in how moral issues are discussed with children. Wang (2008) describes Chinese working class mothers’ reaction to their children’s transgressions. They very often used social referencing, reminding the child about other children, media characters, authority figures or traditional stories or quotations who were better models. Here are two examples, the second of which seems subtly distinct from what Western parents say:

‘... the mother took out a box of sweets to treat the visitors. Xiamen, a 4-year-old girl, grabbed a handful of them.

_Mother:_ Xiaomei, let the guests have the sweets first. You must learn how to be polite. Do you remember Meimei [a cartoon character in a child’s TV programme who is very kind, polite and generous to others]?

_Xiaomei:_ (Puts two sweets back in the box)

_Mother:_ Just keep one piece. Give one piece to Aunty Wang and one to Aunty Xu. Put the rest in your hand back in the box. Do you remember that toothless tiger [a cartoon figure] you
saw the other day? He lost all his teeth because the little fox tricked him into eating all the sweets. Oh, do you remember Pipi [another cartoon figure]? What happened to him? Did he eat too many sweets? Did he have to go to see the doctor?

_Xiaomei:_ (Runs away)

(Wang 2008, p. 60)

‘Qixing, a 4-year 2-month-old boy is playing with his rice while having lunch.

_Mother:_ Qixing, don’t play with the rice! Do you remember what the Tang poem says?

_When the sun is hot, the peasants are planting the rice. While they are planting the rice, their sweat dropped in the field. Every bit of rice in the plate symbolises the hardship of the peasants. Don’t waste the rice. It’s not easy to grow it!’

Eat!

_Qixing:_ (Picks up the rice)

(Wang 2008, p. 62)

There is a fascinating interplay here between the internal feelings of the child, the microsystem of child and mother, and a set of macrosystems at the level of the culture. The first mother appeals to the child on the basis of the feelings of guests present in the room and with reference to two contemporary TV cartoon characters, including reference to the harm that the child might do to herself if she eats too many sweets. The second refers to a didactic poem more than a thousand years old, and perhaps implicitly to more recent solidarity with the workers and peasants. The two cases imply a strong appeal to the timelessness of the need to be respectful of other people’s rights, to share and not to waste.
LINKS BETWEEN MORAL REASONING, IDENTITY AND EMOTION

A philosophical tradition which can be traced back to the ancient Greeks insists, first, that morality is not a self-subsistent entity but a part of the functioning of the individual as a whole, integrated with the personality system and so linked to social functioning and motivation; second, that it involves questions of intention, identity, power and agency; and third, that it is linked to other human ideals such as truth and beauty (Blasi 2004; Nisan 2004; Lagatutta et al. 2007; Oyserman 2017). The embedding of moral reasoning within social settings suggests that it will not be free of emotion, and hence that emotion-free accounts of moral development will be missing important issues. Young children recognise the emotional colouring of the situations that involve moral reasoning. In studies by Arsenio and colleagues (Arsenio and Kramer 1992, Arsenio and Lemerise 2001), for example, even kindergarten children thought that people who were doing morally good things, benefiting from them, or witnessing them (helping another person, sharing out a reward fairly) would have positive emotions; those suffering from or observing an unfair act would feel bad (though the younger children thought the victimizer might feel good about their act if it got them what they wanted); those going against a convention, or witnessing a breach of convention, would feel neither good nor bad about it, though they expected authority figures to be upset. Lagatutta et al. (2007) found that breaches of moral rules in order to protect one’s own valued identity (for example, ignoring a parental prohibition of an activity that you enjoyed and valued highly) was blamed less than other breaches of rules. Moral issues are thus associated with emotional and social outcomes from the beginning, and children’s understanding of emotion – for example, their difficulties in recognising incompatible emotions – and their social position – for example, what identity they have – might be relevant to their moral judgments and actions.
The goal of assessment is intervention. To meet this goal, the assessment process is designed to gather behavioral information relevant to intervention. It is not enough, however, to be able to describe the behaviors of concern to design an effective intervention. We must also have some understanding of why the behavior occurs. For example, a student might have difficulty completing independent classwork because he or she is distracted by a peer talking or because he or she doesn’t know how to do the task (or both). Thus, throughout the assessment process we employ a hypothesis-testing approach. At each step, as information is gathered we formulate hypotheses about the environment and the child’s skills that can help explain the behavior observed. By soliciting information from others and by observing the child in the natural environment and in the test environment, we refine our hypotheses and try to confirm or refute them.

This same hypothesis-testing approach can simultaneously lead to potential intervention strategies. For example, in the above example if the teacher has observed increased work completion when he or she is close by or when peers are not talking, the attention–distractibility hypothesis gains credibility. This information then also sets the direction for intervention. If, on the other hand, the “why” of this student’s behavior is not clear, as part of our hypothesis testing we might ask the teacher to stand close by or relocate the student. The outcome will help to clarify the “why” and the intervention strategy.

Once we have gathered our data and generated our hypotheses, the next stage in the assessment-intervention link is translation of these data into a format and plan for intervention. We have developed a process to help organize and synthesize our assessment information for the purpose of designing interventions targeted to those areas of greatest need, as defined by parents, teachers, or both. This process (also summarized in Table 3.1) includes the following steps:

1. Collect assessment information from a variety of sources, including interviews, behavior checklists, classroom observations, work samples, and formal assessment procedures. Whenever possible, use naturally occurring data sources.

2. Consider each executive skill in turn and identify areas of need in specific, behavioral terms. If you are not sure under which executive skill a behavior should be coded, include it under those that seem most relevant.

3. Determine which executive skill will be targeted for intervention first, and identify a specific behavioral goal. The following question, posed to parents or teacher may be helpful in identifying which behaviors are a priority for intervention: ”What are one or two behaviors, which, if they increased or decreased, would lead you to say [student’s
name] is definitely performing better?” For the intervention to be implemented successfully, having all parties involved (parents, teachers, etc.) agree to the goal will be essential. When defining the behavioral goal, make every effort to use naturally occurring data sources [i.e., statistics or other data already being collected by either the teacher or the school]. When this is not possible, consider a more individualized measurement system. Table 3.2 lists examples of each.

4. Design the intervention. Three critical elements must be considered in planning the intervention: [1] the environmental supports or modifications that will be put in place to help support development of the skill; [2] the specific skills the child will be taught and the procedure used to teach them; and [3] what incentives will be used to help motivate the child to use or practice the skills. These elements are all described in detail in Chapter 4.

5. Evaluate intervention effectiveness. This is done subsequent to putting the interview in place. The first step in evaluating the intervention is to review the behavioral objective and assess whether the objective was achieved. Whether the objective was achieved or not, the next step is to evaluate the individual components of the intervention to determine whether they were implemented effectively. Make plans for continuing, changing, or fading intervention components, depending on the effectiveness of the intervention. This analysis might also lead to the conclusion that the behavioral objective was unrealistic. If this is the case, a new objective should be written and an intervention designed appropriate to the new objective.

<table>
<thead>
<tr>
<th>Step 1</th>
<th>Step 2</th>
<th>Step 3</th>
<th>Step 4</th>
<th>Step 5</th>
</tr>
</thead>
<tbody>
<tr>
<td>Collect assessment information from a variety of sources.</td>
<td>Review data; list specific problem behaviors and connect them to the most appropriate executive skill domain.</td>
<td>Select one executive skill domain for initial intervention and identify a specific behavioral goal (e.g., by soliciting from parents or teachers one or two behaviors, which if increased or decreased would lead to better performance for the student).</td>
<td>Design the intervention, incorporating one or more of the following elements:</td>
<td>Evaluate intervention effectiveness by looking at each intervention component and answering the following questions:</td>
</tr>
<tr>
<td>• Interviews</td>
<td>• Environment supports or modifications that will be put in place to help support the development of the skill.</td>
<td>• The specific skills the child will be taught and the procedure used to teach them.</td>
<td>• Was the component put in place?</td>
<td>• Was it effective?</td>
</tr>
<tr>
<td>• Behavior checklists</td>
<td>• What incentives will be used to help motivate the child to use or practice the skills.</td>
<td>• Does it need to be continued?</td>
<td>• What is the plan for fading this component?</td>
<td></td>
</tr>
<tr>
<td>• Classroom observations</td>
<td>• Formal assessment procedures</td>
<td>• Table 3.1 • Steps in Executive Skills Intervention Planning</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Table 3.1 • Steps in Executive Skills Intervention Planning
DEVELOPING BEHAVIORAL OBJECTIVES AND MEASURING INTERVENTION EFFECTIVENESS

The success of this process hinges on the careful description of the desired outcome of the intervention and the agreement of all parties to this outcome. Identifying target behaviors leads to the development of a behavioral objective. This step will drive the remainder of the process including outcome evaluation criteria. According to Alberto and Troutman [1999, p. 66], there are four components to a behavioral objective. The objective should: (1) identify the learner (“Scott will ... ”); (2) identify the target behavior (“complete his daily assigned homework ... ”); (3) identify the conditions under which the behavior is to be displayed (“between 4:00 and 7:00 P.M. with no more than two adult verbal prompts ... ”); and (4) identify criteria for acceptable performance (“for 90% of the assignments given during a marking period”). A target behavior is one that is observable and agreed upon by different staff (and parents where applicable). For example, on the following page we have used the term meltdown to describe a behavior. We assume that additional descriptors (e.g., “drops to the floor and cries”) would be needed for that term to be operationalized.

Table 3.3 provides examples of behavioral objectives (along with a more detailed description of the data collection procedure) for each executive skill. We selected

<table>
<thead>
<tr>
<th>Measure</th>
<th>Relevant Executive Skills</th>
</tr>
</thead>
<tbody>
<tr>
<td>Percentage homework handed in on time</td>
<td>Task initiation, working memory, sustained attention, time management, goal-directed persistence</td>
</tr>
<tr>
<td>Homework accuracy [% items correct]</td>
<td>Working memory, metacognition</td>
</tr>
<tr>
<td>Test/quiz grades</td>
<td>Working memory, metacognition</td>
</tr>
<tr>
<td>Assignment grades</td>
<td>Working memory, planning, organization, time management, metacognition, goal-directed persistence</td>
</tr>
<tr>
<td>• Writing assignments</td>
<td></td>
</tr>
<tr>
<td>• Projects</td>
<td></td>
</tr>
<tr>
<td>• Notebook checks</td>
<td></td>
</tr>
<tr>
<td>Discipline referrals/detentions</td>
<td>Response inhibition, emotional control, flexibility</td>
</tr>
<tr>
<td>Tardiness</td>
<td>Time management</td>
</tr>
<tr>
<td>Behavior counts [e.g., latency, interval recordings, frequency of response, rate of response, percentage of response]</td>
<td>All of these measures can be adapted to assess any executive skill. See Table 3.3 for examples.</td>
</tr>
<tr>
<td>Likert-type scales</td>
<td></td>
</tr>
<tr>
<td>Rubrics</td>
<td></td>
</tr>
<tr>
<td>Coaching goals [e.g., % coaching goals met]</td>
<td></td>
</tr>
</tbody>
</table>

Table 3.2 • Outcome Measures

DEVELOPING BEHAVIORAL OBJECTIVES AND MEASURING INTERVENTION EFFECTIVENESS

The success of this process hinges on the careful description of the desired outcome of the intervention and the agreement of all parties to this outcome. Identifying target behaviors leads to the development of a behavioral objective. This step will drive the remainder of the process including outcome evaluation criteria. According to Alberto and Troutman [1999, p. 66], there are four components to a behavioral objective. The objective should: (1) identify the learner (“Scott will ... ”); (2) identify the target behavior (“complete his daily assigned homework ... ”); (3) identify the conditions under which the behavior is to be displayed (“between 4:00 and 7:00 P.M. with no more than two adult verbal prompts ... ”); and (4) identify criteria for acceptable performance (“for 90% of the assignments given during a marking period”). A target behavior is one that is observable and agreed upon by different staff (and parents where applicable). For example, on the following page we have used the term meltdown to describe a behavior. We assume that additional descriptors (e.g., “drops to the floor and cries”) would be needed for that term to be operationalized.

Table 3.3 provides examples of behavioral objectives (along with a more detailed description of the data collection procedure) for each executive skill. We selected
target behaviors that are frequently a source of concern to classroom teachers. We have identified how progress will be measured, but with most of the objectives we have not identified who will monitor progress. In some cases, the classroom teacher is the most logical person to do this, but it may be more appropriate to have someone else—a paraprofessional, guidance counselor, special education teacher, or school psychologist—be the individual in charge of monitoring progress.

We now offer a case example that illustrates both the assessment process and how that assessment is linked to intervention design. Following a description of the child (named Scott) and the assessment results, we include an “Intervention Design Form” that captures the behaviors of concern and lays out a process for developing appropriate interventions. The example is of a 9-year-old child with multiple executive skill problems. The intervention described is multidimensional in that a single process is used to address many of the needs identified during the assessment process. It does not address all the problems, however. Once this process is successfully in place, other issues such as poor error monitoring can then be addressed.

In the real world not all intervention planning is as detailed or precise as we have described here, nor does it need to be. The guiding principle in designing an intervention should be the least amount of support/training necessary for the student to successfully manage the current problem and similar, related problems as they arise. The latter criterion is important since the goal for the child is not only to solve a specific problem but to transfer and generalize the skill to other problems.
<table>
<thead>
<tr>
<th>Executive Skill</th>
<th>Sample behavioral objective</th>
<th>How progress will be measured</th>
</tr>
</thead>
<tbody>
<tr>
<td>Response inhibition</td>
<td>In class discussions, student will raise his or her hand and wait to be called on 90% of the time before giving an oral response.</td>
<td>Compute percentage of “hand-raising” responses given over total number of responses given. Student and teacher will graph results weekly.</td>
</tr>
<tr>
<td>Working memory</td>
<td>Student will hand in 90% of homework assignments on time.</td>
<td>Compute percentage of homework handed in on time each week; results will be entered in a graphing program and e-mailed to student and his or her parents every Friday.</td>
</tr>
<tr>
<td>Emotional control</td>
<td>Student will request “help” or “break” when given an assignment he or she finds difficult or frustrating.</td>
<td>Keep running tally of “meltdowns” (defined behaviorally) during independent work time; graph will be completed weekly and shared with student every Friday.</td>
</tr>
<tr>
<td>Sustained attention</td>
<td>Student will complete class assignments within time frame set by teacher 90% of the time.</td>
<td>Count percentage of assignments finished within allotted time; student and teacher will keep daily graph of results.</td>
</tr>
<tr>
<td>Task Initiation</td>
<td>Student will start all classroom assignments within 5 minutes of designated start time.</td>
<td>Set kitchen timer at designated start time. When the bell rings, will check in with student to see whether the assignment is begun. Percent assignments started on time will be graphed by student and teacher daily.</td>
</tr>
<tr>
<td>Planning/ prioritization</td>
<td>With teacher supervision, student will complete project planning form for every long-term assignment, including a description of steps or subtasks and timelines for each item.</td>
<td>Review project planning form and with student grade quality of planning description using a 1–5 scale (1 = poorly planned with missing elements or unrealistic/unspecified timelines; 5 = well planned, all critical elements defined with precision, complete and realistic timelines); scores will be maintained on a running graph.</td>
</tr>
<tr>
<td>Organization</td>
<td>Student will maintain neat desk in the classroom with places allocated for books, notebooks, pencils, etc., and no extraneous materials.</td>
<td>With help from an adult, student will write a list of what a neat desk looks like. Conduct random spot checks at least once a week and together student and teacher will judge how many items on the list are present. Results will be maintained on a running graph.</td>
</tr>
<tr>
<td>Time management</td>
<td>Student will estimate correctly (to within 10 minutes) how long it takes to complete daily homework assignments and will make and follow a written homework schedule at least four nights per week.</td>
<td>Student will write a daily plan listing all work to be completed, an estimate of how long each task will take, and start and stop times for each task. Coach and student will review previous day’s plan every day and rate how well plan was followed using a 1–5 scale (1 = poorly developed plan, poorly executed; 5 = well-developed plan, followed successfully, with accurate time estimates for task completion). Results will be maintained on a running graph.</td>
</tr>
<tr>
<td>Goal-directed persistence</td>
<td>With assistance from guidance counselor, student will complete college application process, applying to at least four schools and getting applications in by deadline.</td>
<td>Student and guidance counselor will create a plan for completing college application process, with deadlines for each step in plan. Guidance counselor will track number of cues or reminders needed for student to complete each step in plan; results will be graphed and shared with student on a weekly basis.</td>
</tr>
<tr>
<td>Flexibility</td>
<td>Student will use coping strategies to get back on track when he or she meets obstacles in completing class assignments.</td>
<td>Student will complete coping strategies checklist; track percentage of time he or she returns to his or her work within 5 minutes.</td>
</tr>
<tr>
<td>Metacognition</td>
<td>Student will use a proofreading checklist for all writing assignments of two or more paragraphs.</td>
<td>Count number of mechanical errors per paragraph for all writing assignments of two or more paragraphs and together with student will keep a running graph of data.</td>
</tr>
</tbody>
</table>

Table 3.3 • Sample Behavioral Objectives and Measurement Procedures
CASE EXAMPLE

To illustrate the assessment process, we now present a brief case example in which a variety of assessment techniques were incorporated. The assessment procedure is described along with the information obtained from that procedure.

PARENT INTERVIEW/DEVELOPMENTAL HISTORY FORMS

Scott is a 9-year-old child living with his parents and older brother and attending a small private school. Birth history was unremarkable and developmental milestones were within normal limits. There is no significant family or medical history. Scott has attended the same school since preschool, and according to parent reports, teachers noted a tendency to wander around the classroom and to have difficulty initiating activities as early as preschool.

In kindergarten, problems with activity level, concentration, and distractibility were all reported. Parents initiated an evaluation because teachers were reporting continuing problems with task initiation and work completion, as well as concerns about motor restlessness and impulsivity.

At home, Scott’s parents describe him as an active child who prefers to be outdoors or on the go. He has difficulty sitting through meals and requires frequent reminders to complete chores and follow morning routines. He is able to engage in both reading and television viewing for long periods of time with no apparent attention problems. Homework completion, however, is problematic both due to difficulty getting started on homework and seeing it through to completion. Scott has friends outside of school with whom he plays regularly. However, his parents note that he has some difficulty interpreting social cues and he seems to have difficulty “fitting into a group.” He tends to be literal, overly concrete, and lacks flexibility.

TEACHER INTERVIEW

In an interview the evaluator conducted with Scott’s teachers, they describe him as an active child who has an almost constant need to be “moving or touching someone.” Hence, boundary issues with peers arise frequently and require teacher attention and mediation. His impulsivity can extend to his work, resulting in messy papers, broken pens/pencils, and cluttered spaces. Other than fiction reading, he has difficulty with initiation and completion of work, especially if it involves written output. At the same time, they see Scott as a boy who is curious about almost any subject and eager to
learn. His teachers feel that if he could better manage his impulsivity and task focus, there would be significant improvements in peer relationships and academics.

### BEHAVIOR RATING SCALES

Scott’s parents completed the Child Behavior Checklist [Achenbach, 1991a], placing Scott in the clinical range on the scale as a whole and on the Social Problems and the Attention Problems subscales. They also completed that ADHD Rating Scale—Home Version [DuPaul, Power, Anastopoulos, & Reid, 1998] and placed Scott in the clinical range [i.e., above the 93rd percentile] on both the Inattention and Hyperactive/Impulsive subscales. His teachers placed him in the clinical range on the Externalizing Problems of the Child Behavior Checklist—Teacher Report Form (Achenbach, 1991b) and in the borderline clinical range on the scale as a whole and on the Hyperactivity/Impulsivity subscale. They placed him below the clinical range on the ADHD Rating Scale—School Version (DuPaul et al., 1998). However, on the Comprehensive Behavior Rating Scale for Children [Neeper, Lahey, & Frick, 1990], teachers placed him in the clinical range on the Motoric Hyperactivity and the Oppositional/Conduct Disorders subscales.

Parents and teachers also completed the Behavior Rating Inventory of Executive Function [Gioia et al., 2000]. His parents placed him in the clinical range on the total scale, on the Metacognitive Index, and on five of eight subscales (Shift, Initiate, Working Memory, Plan/Organize, Monitor). His teachers placed him in the clinical range on the scale, on both the Behavior Regulation Index and the Metacognitive Index and all eight subscales (Inhibit, Emotional Control, and Organization of Materials, in addition to those the parents reported).

Taken, parents and teachers both reported significant executive skills weaknesses. Parents also reported significant attention problems and social problems, but these dimensions were rated as less problematic by teachers, other than problems with task initiation and work completion. Teachers, however, reported higher levels of acting out or externalizing behaviors, perhaps associated with impulsivity and overactivity.

### BEHAVIORAL OBSERVATIONS

Scott was observed in his classroom during two periods, one involving independent math work and the other a teacher-led discussion with students sitting in a circle. Percentage of time on task was assessed during the 15-minute independent period.
In comparison to a male peer judged by the teacher to have average attention, Scott was on task 35% of the time versus 75% for the other boy. In addition to moving around frequently, Scott intermittently made random, low-level sounds. During the teacher-led activity, frequency of physical contact with nearby peers (touching, bumping, laying against them) was measured using an interval recording technique. Scott was in physical contact with other students during 55% of the intervals in comparison to 10% for a matched peer.

During the evaluation session, Scott presented as initially quiet and serious, but he became more talkative as the session went along. He tended to respond quickly to questions, his initial answers often being both impulsive and incorrect. Careless mistakes due to inattention were observed, particularly on visual tasks, and he failed to check his work for accuracy.

FORMAL ASSESSMENT RESULTS

Both as a device for facilitating behavioral observations and because his parents were interested in obtaining information about Scott’s learning style, cognitive, memory, and attention tasks were administered. Scott placed in the above-average range on the WISC-III (Wechsler, 1991), with verbal skills falling in the superior range and nonverbal performance skills falling in the average to above-average range. Long-term memory for verbal information was particularly strong. On visual tasks, inattention to detail affected performance on some tasks, particularly those where there was no easy way to check his work for accuracy (e.g., Picture Completion, Picture Arrangement).

Scott’s performance on the subtests comprising the Memory Screening Index of the Wide Range Assessment of Memory and Learning (Sheslow & Adams, 1990) fell in the above-average to well-above-average range for the most part, but he was weaker on the Digit Span subtest of the WISC-III, considered to be a measure of working memory. On this measure, he was inconsistent in his recall of numbers in both forward and backward sequences, scoring at the low end of the average range.

Scott was administered two attention tasks. On the Mesulam Tests of Directed Attention (Mesulam, 1985), a letter-cancellation task, he was asked to locate target letters in ordered and random letter arrays. Although he missed only 4 of 60 targets on the ordered array, he missed 21 of 60 targets on the random array. He spent an equal amount of time on each array, but whereas he was able to employ a systematic search strategy on the ordered array (i.e., going row by row), the random array did not lend itself to this kind of strategy. In the absence of such a search strategy, it
appeared that Scott did not know how to evaluate when he was done with the task; thus he missed significantly more target letters. On a computerized attention task, Conners’ Continuous Performance Test (Conners, 2000), Scott’s response speed was atypically fast, suggestive of impulsivity, but he was able to sustain attention to the 15-minute task without apparent difficulty.

CONCLUSIONS

Test results indicate a bright youngster with exceptional verbal skills. The cognitive profile of significantly stronger verbal than nonverbal/visual skills suggests Scott may have some characteristics associated with a nonverbal learning disability, such as the cognitive rigidity his parents describe as well as difficulty reading social cues. Both verbal and visual memory skills are strong, but working memory is more problematic. Some attention problems were seen on clinic tasks. Both parents and teachers report significant problems with impulsivity and activity level, while parents also report significant problems with inattention, including distractibility, daydreaming, and difficulty concentrating. The greatest impediments to social–emotional adjustment and to academic performance at the present time appear to be related to weak executive skills, including problems with behavioral regulation (response inhibition, flexibility) as well as problems with task initiation, working memory, and sustained attention.

RECOMMENDATIONS

Scott has a number of executive skill weaknesses that warrant interventions. Priorities need to be set targeting those deficit areas that are having the biggest negative impact at the present time. Since both his parents and his teachers are primarily concerned with Scott’s behavior and performance at school, designing interventions for this setting is most appropriate. Targeting impulsivity and work completion would address the most pressing needs. Strategies should include environmental modifications, a behavior plan built around an incentive system, and teaching specific skills to improve sustained attention and task completion. An intervention to address homework issues would also be warranted. **Figure 3.1** depicts how the assessment data are linked to interventions. An intervention to address work completion in school is presented in greatest detail, beginning with problem definition and ending with an assessment of how the intervention worked. (See Form 3.1 on p. 187 in the Appendix for a reproducible version.) **Figure 3.2** depicts the intervention design phase for two additional behavioral objectives.
### Data Sources – check all that apply

<table>
<thead>
<tr>
<th></th>
<th>✓ Parent Interview</th>
<th>✓ Parent Checklists</th>
<th>✓ Classroom Observation</th>
<th>✓ Teacher Interview</th>
<th>✓ Teacher Checklists</th>
<th>✓ Work Samples</th>
<th>✓ Student Interview</th>
<th>✓ Student Checklists</th>
<th>✓ Formal Assessment</th>
</tr>
</thead>
</table>

### Areas of Need – fill in applicable sections

<table>
<thead>
<tr>
<th><strong>Response Inhibition (RI)</strong></th>
<th>The capacity to think before acting</th>
</tr>
</thead>
<tbody>
<tr>
<td>Specific problem behaviors (e.g., talks out in class; interrupts; says things without thinking)</td>
<td></td>
</tr>
<tr>
<td>1.</td>
<td></td>
</tr>
<tr>
<td>2.</td>
<td></td>
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<tr>
<td>3.</td>
<td></td>
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</tbody>
</table>

<table>
<thead>
<tr>
<th><strong>Working Memory (WM)</strong></th>
<th>The ability to hold information in memory while performing complex tasks</th>
</tr>
</thead>
<tbody>
<tr>
<td>Specific problem behaviors (e.g., forgets directions; leaves homework at home; can’t do mental arithmetic)</td>
<td></td>
</tr>
<tr>
<td>1. <strong>Forgets to do homework unless prompted.</strong></td>
<td></td>
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<tr>
<td>2.</td>
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<td>3.</td>
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</tbody>
</table>

<table>
<thead>
<tr>
<th><strong>Emotional Control (EC)</strong></th>
<th>The ability to manage emotions in order to achieve goals, complete tasks, or control or direct behavior</th>
</tr>
</thead>
<tbody>
<tr>
<td>Specific problem behaviors (e.g., ‘freezes’ on tests; gets frustrated when makes mistakes; stops trying in the face of challenge)</td>
<td></td>
</tr>
<tr>
<td>1.</td>
<td></td>
</tr>
<tr>
<td>2.</td>
<td></td>
</tr>
<tr>
<td>3.</td>
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</tr>
</tbody>
</table>
**Sustained Attention (SA)**
The capacity to maintain attention to a situation or task in spite of distractibility, fatigue, or boredom

<table>
<thead>
<tr>
<th>Specific problem behaviors (e.g., fails to complete classwork on time; stops work before finishing)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
</tr>
<tr>
<td>2.</td>
</tr>
<tr>
<td>3.</td>
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</tbody>
</table>

**Task Initiation (TI)**
The ability to begin projects without undue procrastination, in an efficient or timely fashion

<table>
<thead>
<tr>
<th>Specific problem behaviors (e.g., needs cues to start work; puts off long-term assignments)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. <strong>Starts tasks at last minute.</strong></td>
</tr>
<tr>
<td>2.</td>
</tr>
<tr>
<td>3.</td>
</tr>
</tbody>
</table>

**Planning/Prioritization (P)**
The ability to create a roadmap to reach a goal or to complete a task

<table>
<thead>
<tr>
<th>Specific problem behaviors (e.g., doesn’t know where to start an assignment; can’t develop a timeline for long-term assignments)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
</tr>
<tr>
<td>2.</td>
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<tr>
<td>3.</td>
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</tbody>
</table>

**Organization (O)**
The ability to create and maintain systems to keep track of information or materials

<table>
<thead>
<tr>
<th>Specific problem behaviors (e.g., doesn’t write down assignments; loses books or papers)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
</tr>
<tr>
<td>2.</td>
</tr>
<tr>
<td>3.</td>
</tr>
</tbody>
</table>

*(cont...)*
### Time Management (TM)

The capacity to estimate how much time one has, how to allocate it, and how to stay within time limits and deadlines.

Specific problem behaviors (e.g., doesn’t work efficiently; can’t estimate how long it takes to do something):

1. 
2. 
3. 

### Goal-Directed Persistence (GDP)

The capacity to have a goal, follow through to the completion of the goal, and not be put off by or distracted by competing interests.

Specific problem behaviors (e.g., doesn’t see connection between homework and long-term goals; doesn’t follow through to achieve stated goals):

1. 
2. 
3. 

### Flexibility (F)

The ability to revise plans in the face of obstacles, setbacks, new information, or mistakes; it relates to an adaptability to changing conditions.

Specific problem behaviors (e.g., gets stuck on one problem-solving strategy; gets upset by unexpected changes to schedule or plans):

1. 
2. 
3. 

### Metacognition (M)

The ability to stand back and take a bird’s-eye view of oneself in a situation; the ability to self-monitor and self-evaluate.

Specific problem behaviors (e.g., doesn’t have effective study strategies; difficulty catching or correcting mistakes):

1. Makes mistakes; doesn’t check work.
2. 
3. 

---

**Establish Goal Behavior** – select specific skill to work on [see next pages for goal behaviors]
**GOAL BEHAVIOR 1**

Target Executive Skill: **Working memory, task initiation**

Specific Behavioral Objective: **Scott will write and follow a daily classwork schedule, as demonstrated by completing 90% of daily assigned tasks with no more than two adult verbal prompts.**

### Design Intervention

<table>
<thead>
<tr>
<th>What environmental supports or modifications will be provided to help reach the target goal?</th>
</tr>
</thead>
<tbody>
<tr>
<td>Presentation of brief tasks; alternate nonpreferred with preferred activities; closed-ended tasks (at least at first).</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>What specific skills will be taught, who will teach skill, and what procedure will be used to teach the skill(s)?</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Skill:</strong> To make and follow a daily classroom work plan.</td>
</tr>
<tr>
<td><strong>Who will teach skill:</strong> Teacher.</td>
</tr>
<tr>
<td><strong>Procedure:</strong></td>
</tr>
<tr>
<td><strong>Step 1:</strong> The teacher arranges to meet with Scott to explain the process.</td>
</tr>
<tr>
<td><strong>Step 2:</strong> They decide how often they need to meet and make a plan.</td>
</tr>
<tr>
<td><strong>Step 3:</strong> Explain the planning template to Scott.</td>
</tr>
<tr>
<td><strong>Step 4:</strong> Walk Scott through the planning template at the agreed-upon times...</td>
</tr>
<tr>
<td>• “Let’s look at what you have to do.”</td>
</tr>
<tr>
<td>• Make list of the tasks.</td>
</tr>
<tr>
<td>• Estimate how long it will take to do each task.</td>
</tr>
<tr>
<td>• Decide on start time for each task.</td>
</tr>
<tr>
<td>• Decide on breaks or other reinforcers. <strong>Step 5:</strong> Teacher cues start time.</td>
</tr>
<tr>
<td><strong>Step 6:</strong> Teacher checks in at 10-minute intervals to make sure Scott’s following the plan.</td>
</tr>
</tbody>
</table>

*(cont...)*
What incentives will be used to help motivate the student to use/practice the skill(s)?
Breaks between tasks (with opportunity to move around and/or read for pleasure). Every other task is a preferred task (e.g., reading).

How will the outcome be measured?
Teacher will calculate percent assignments handed in on time and average number of prompts needed per assignment, using the following tracking form:

- Date: __________________
- Number of assignments: __________________
- Number completed on time: __________________
- Number of prompts required per assignment (circle one):
  1. Three or more prompts
  2. One to two prompts
  3. No prompts

Evaluate Intervention
Review date: _________________

Was the behavioral objective met?

- [ ] Yes, completely
- [ ] Yes, partially
- [ ] No
Assessment of efficacy of intervention components:

<table>
<thead>
<tr>
<th>Environmental Supports/Modifications</th>
</tr>
</thead>
<tbody>
<tr>
<td>Were they put in place? <strong>Yes.</strong></td>
</tr>
<tr>
<td>Were they effective? <strong>Yes.</strong></td>
</tr>
<tr>
<td>Do they need to be continued? <strong>Yes.</strong></td>
</tr>
<tr>
<td>Plan for fading supports: <strong>Don’t fade template, but fade teacher questions as process becomes internalized in working memory and incorporate longer in-class tasks and more advanced assignments.</strong></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Skill Instruction</th>
</tr>
</thead>
<tbody>
<tr>
<td>Was the instruction implemented? <strong>Yes.</strong></td>
</tr>
<tr>
<td>What was the outcome? <strong>Scott can make and follow plan without step-by-step instruction.</strong></td>
</tr>
<tr>
<td>Does the instruction need to be continued?</td>
</tr>
<tr>
<td>Plan for fading instruction: <strong>Current instructional sequence already faded.</strong></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Incentives</th>
</tr>
</thead>
<tbody>
<tr>
<td>Were incentives used? <strong>Yes.</strong></td>
</tr>
<tr>
<td>Were they effective? <strong>Yes.</strong></td>
</tr>
<tr>
<td>Do they need to be continued? <strong>Yes.</strong></td>
</tr>
<tr>
<td>Plan for fading incentives: <strong>Retain incentives but increase work time between breaks.</strong></td>
</tr>
</tbody>
</table>

Date for next review: _________________
GOAL BEHAVIOR 2

Target Executive Skill: Response inhibition
Specific Behavioral Objective: Scott will have “safe hands” (will not engage in hugging, pushing, tripping, kicking, punching, pinching, or other forms of unwelcome physical contact) with classmates.

Design Intervention

What environmental supports or modifications will be provided to help reach the target goal?

When working independently, Scott will select a work space greater than an arm’s length away from the workspace of another child.

Make sure he is not in proximity to peers with whom physical contact is a high probability (i.e., other children with problems with response inhibition).

Before free-time activities, teacher will cue Scott to use “safe hands.”

For any activity requiring physical contact, teacher will define permitted contact for Scott before the activity begins.

What specific skills will be taught, who will teach skill, and what procedure will be used to teach the skill(s)?

Skill: To use safe hands.

Who will teach skill: Teacher.

Procedure:

Step 1: Explain the skill being worked on (“safe hands”). Give alternative things to do with hands (e.g., fidget toys or a directed activity) when he’s in situations where problems are likely to arise.

Step 2: Model the skill.

Step 3: Practice the skill, with constructive feedback. Step 4: Bring in other children to help practice the skill.

Step 5: Cue him to use the skill in classroom and free-time situations.
What incentives will be used to help motivate the student to use/practice the skill(s)?

- Verbal feedback; verbal praise.
- The alternate activities themselves will be rewarding.
- Checks or tokens if necessary.

How will the outcome be measured?

Teacher will count number of reminders to use safe hands for each activity in which the problem is likely to arise, using the following tracking form:

Date: _______________

Number of reminders required per activity (circle one):

- 1. More than one reminder
- 2. One reminder
- 3. No reminders

GOAL BEHAVIOR 3

Target Executive Skill: Working memory, task initiation

Specific Behavioral Objective: Scott will write and follow a daily homework schedule, as demonstrated by completing 90% of daily assigned homework with no more than two adult verbal prompts.

Design Intervention

What environmental supports or modifications will be provided to help reach the target goal?

- Daily Homework Planner
- Adult prompts to make sure homework plan is made and to cue start time(s)

Figure 3.2 • Examples of additional interventions targeting Scott’s executive skills weaknesses. (cont...)
**What specific skills will be taught, who will teach skill, and what procedure will be used to teach the skill(s)?**

**Skill:** To make and follow a daily homework plan.

**Who will teach skill:** Parent/Teacher.

**Procedure:**

1. Arrange meeting with teacher, parent, and Scott to explain homework process to Scott.
2. Decide on a set time to make the daily plan.
3. Follow planning process—
   - “Let’s look at what you have for homework.”
   - Make list of homework tasks.
   - Estimate how long it will take to do each task.
   - Decide on start time for each task.
   - Decide on breaks or other reinforcers.
4. Parent cues start time.

**What incentives will be used to help motivate the student to use/practice the skill(s)?**

- Breaks between tasks.
- Fun activity to play when homework is finished.

**How will the outcome be measured?**

Parents will calculate average number of prompts needed per homework session, using the following tracking form:

- **Date:** ________________
- **Number of assignments:** ________________
- **Number completed:** ________________
- **Number of prompts required per homework session (circle one):**
  1. Three or more prompts
  2. One to two prompts
  3. No prompts

---

*Figure 3.2 • Examples of additional interventions targeting Scott’s executive skills weaknesses. (cont.)*
FITTING EXECUTIVE SKILLS DEVELOPMENT TO RTI

Since writing the first edition of this book, many schools have begun using a RTI process to meet the needs of students with learning and behavioral problems. This is an integrated approach to service delivery that encompasses general and special education, developed to correct some of the shortcomings in traditional special education practice. According to experts (Batsche et al., 2005), RTI can be defined as “the practice of (1) providing high quality instruction/intervention matched to students needs and (2) using learning rate over time and level of performance to (3) make important educational decisions” (p. 3).

To date, RTI has been most widely applied to academic problems and has been used for students identified as having specific learning disabilities. However, the methodology is also increasingly used with students with behavioral challenges as well; thus, it is a versatile approach that can be applied across a broad array of skill deficits, including executive skills.

The key elements of the RTI model include:

- The emphasis on evidence-based instruction and classroom-based intervention.
- The emphasis on early identification and intervention. With RTI, children will not be required to fail before interventions can be implemented.
- The use of progress monitoring, based on objective student performance data, to inform instruction and decision making.
- The use of a problem-solving method to make decisions within a multitiered model. A multitiered model enables services to be deployed based on the severity of student need.

Typically, schools using RTI employ a three-tiered model of service delivery, depicted as a triangle (see Figure 3.3). At the universal level (Tier 1) are classroom or schoolwide programs designed to meet the needs of the majority of students. Examples include an evidence-based developmental reading program or a schoolwide positive discipline program. The targeted level (Tier 2) is designed to meet the needs of 10–15% of the student population for which universal supports are insufficient. Targeted interventions are frequently small-group interventions such as Title I reading groups or social skills groups. For the 1–7% of students with chronic or more severe needs, intensive level interventions are required (Tier 3). These are highly individualized programs that deliver specialized instruction, in the case of learning problems, or comprehensive behavior support plans, in the case of behavioral problems.
Our clinical experience has taught us that students with executive skills weaknesses fall along a continuum just as students with other kinds of learning, behavioral, or emotional problems do. At the milder end of the continuum, whole-class interventions are successful. For a student who has trouble remembering to hand in his or her homework, for instance, it may be sufficient to institute a classroom wide homework collection procedure in which students are prompted to place their homework on their desk at the beginning of class and the teacher navigates the room checking off in a rank book the completed assignments.

Students with more pervasive working memory deficits may require a Tier 2 intervention. An example of this might be a small-group coaching arrangement that includes making sure assignment books have been filled in, that students have placed in their backpack everything they need for the night’s homework, and that they have made a homework plan that includes attention to both nightly and long-term assignments. Under the guidance of a teacher, students in this kind of coaching group learn to make plans and timelines, develop strategies for remembering everything they have to remember, and make and use checklists to help them keep track of time and materials.

Students who are in danger of failing classes or failing a grade may need a Tier 3 intervention that is more intensive and more highly individualized. At this level, parents, teachers, specialists, paraprofessionals, and guidance counselors may all have a role to play in helping a student acquire the executive skills he or she needs to be successful.

Interventions that are appropriate for each tier will be presented in Chapter 8. For now, Table 3.4 lists the steps that should be followed in assessing the scope of the executive skill problem and designing appropriate interventions.

If the problem the child experiences is fairly discrete, the child’s teacher may be able to make a relatively easy adjustment in teaching or classroom management without the need for moving beyond Step 2. Here are some examples of behavioral issues that may be related to executive skill weaknesses that can be handled in this way:

- Sam dawdles over independent seatwork. It takes him a long time to get started, he may engage in avoidance behaviors [sharpening his pencil, going to the bathroom, asking the teacher an unnecessary question], and he often stops in the middle of his work to engage in a conversation with other students sitting at his table. As a result, when the morning is done, Sam’s work is not. His teacher feels he is a capable student who likes to get himself off task. She decides to see
whether having him stay in from recess after lunch is enough to improve his work completion rate. She puts this consequence in place, and Sam’s work completion rate rises to 95%.

- Alicia talks out during morning meeting without raising her hand and would dominate the discussion if allowed. Asking her to raise her hand has not been successful, because if she doesn’t get called on right away, she blurts out whatever it was she wanted to say. Her teacher takes her aside and explains why this is a problem. She suggests they work on “self-control.” She explains that she will give Alicia four popsicle sticks at the beginning of circle time. Each time she calls out without raising her hand, she will give her teacher one popsicle stick. If she finishes the morning meeting with at least one stick left, she can choose a sticker. If she has three or four sticks left, she can choose an extra special sticker. Her teacher gives her a sticker book where she can collect her stickers. If she has earned at least four stickers at the end of the week, she gets to take the book home to show her mother. Within a month, Alicia has been able to bring the sticker book home 3 out of 4 weeks. Within 2 months Alicia and the teacher decide together she no longer needs the popsicle sticks or the stickers as reminders.

- Ms. Jacobs, an eighth-grade English teacher, has set up a bin on the table next to her desk and has instructed the class to put their homework in the bin on the way out of class. After trying this for a few weeks, she decides that too many kids are failing to hand in homework, either because they forget or because they...
didn’t do it and they don’t see any visible consequence for failing to hand in the work. She decides she needs to make the accountability more apparent and tells the class she is changing her collection procedure. From now on she will stand at the door as students leave and collect the assignments personally. Any students who fail to hand in the assignment will need to wait until the rest of the class has left and then explain why they don’t have the homework and what their plan is for getting it to the teacher (preferably by 4:00 that afternoon). With this new procedure, class homework completion rates increase from 60 to 90%.

Notice in each case the intervention is designed to address a single, specific problem, and there are data collection procedures built into the intervention in order to address efficacy. The problem is solved without having to move beyond Step 2 in the RTI implementation process.

For more pervasive or more intractable executive skills weaknesses, Tier 2 or Tier 3 interventions will be required. Guidelines for interventions appropriate for all three tiers are detailed in Chapter 8.
CHAPTER 6

PSYCHOLOGY
IN WHICH WE LOOK ESPECIALLY AT PARENTING BEHAVIOUR

This chapter is excerpted from The Science Inside the Child
By Sarah Meadows
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I’ve spent my working life, and some of my personal life, too, thinking about, talking about, reading about, writing about, researching, and teaching developmental psychology. This last science chapter is about this discipline and some of its most important contributions to how we might think about parenting.

Psychology, just to warn you, has two traditional definitions: ‘the science of behaviour’, what people (or other animals) can be observed to do, and ‘the science of mental life’, which implies more attention to unobservable events such as thoughts. There is an uneasy tension between these traditions, and both of them have an uneasy relation with the biological level I have been talking about so far.

Way back at the beginning of writing this book I talked about parent figures’ frames for children. This talk is going to reappear here. But nearer the front of our attention will be the idea of developmental tasks. ‘Developing’ children is analogous to developing a photograph; there’s what the picture is doing as it gains detail and clarity (‘tasks’), and there’s what the photographer is doing to bring about that change (‘frames’). Tasks and frames are interrelated, so they’re both on the agenda of this chapter.

We all need to learn to love and learn through loving. Only the stony-hearted would deny that loving and being loved by other people is important for the happiness of the child (and the parent). The theory about what love does for you has developed in ways that involve contributions from many scientific disciplines – evolutionary theory, brain development, endocrinology, ethology, anthropology – and it is one of the star areas of developmental psychology. There are enormous implications for child development and parenting.

At the core of the psychology of this is John Bowlby’s work on attachment, which was influenced by a wide range of factors – his own personal history, his observation of deeply troubled children in a school where he taught, his training in and use of psychoanalysis, his scientific interest in evolution and animal behaviour. The place that love plays in the child’s life has both biological and social bases. Babies and young children have a strong need for protection, nurturance, care, and comforting. Being able to get other people to look after your interests preserved the safety and well-being of generations of ancestors, so it’s not a surprise that babies are born with an evolved capacity to relate to significant others; to seek to be close to them; to rely on them for the fulfilment of their needs for nurture, protection, and relief from distress; to feel happier and more confident when they are within reach. Behaviours such as smiling, watching, seeking to hold the gaze of the other, crying, following,
clinging to, snuggling up to, and using your attachment figure as a base and reference point are all biologically programmed to develop and maintain attachment relationships, and staying near to your attachment figure should help to keep the very young out of danger.

We see these behaviours in many other species. Attachment is something that is universal in normal children and in a lot of other young animals. Chicks, lambs, calves, foals, and many other animals seek to be near their mothers; they have special distress calls which attract her attention and she has special calls to summon them back to her. Many birds who are able to walk soon after they hatch quickly develop a preference for following their mother, though they can be tricked into ‘imprinting’ on someone else if they see the someone else moving in the right way at the critical period of time. Konrad Lorenz easily taught the geese he bred to follow him like they would naturally follow their mother. Birds who have been induced to imprint on the wrong sort of object (a bird of a different species, for example – or a human ethologist) may look for creatures like it to mate with when they are adults. In King Solomon's Ring, Lorenz tells a number of anecdotes about imprinted animals ‘falling in love’ with an inappropriate partner from a different species. One is about how a jackdaw that had imprinted on him when very young later tried to court him, for example by trying to get the ethologist to squeeze into the cavity (only a few centimetres wide) that the bird had chosen to nest in, and by assiduously feeding him chewed-up worms. Sometimes scientists really do suffer for science. Brain studies of birds suggest that the process of imprinting affects how synapses are pruned away and changes neurotransmitters, which could be the mechanisms for the long-term memory of what sort of person to get attached to. Classic experiments with monkeys showed that warmth and cuddliness are a more important component of attachment than providing food. The licking and arched-back nursing that rodent mothers supply to their pups is an example of what seems to be important for getting the stress system modulated so that the young creature can cope with difficult situations. The amount of licking and grooming that infant rodents and primates receive comes out in many studies as affecting the balance of neurotransmitters, the myelination of nerve fibres in the brain, the expression of genes, and how resilient the animals are able to be in the face of challenge, as I discussed earlier.

There is a lively interaction here between the biological, the psychological, and the social levels of evidence. It is biologically adaptive to form lasting emotional ties, to seek proximity and contact with loved people at times of stress and danger, and to feel increased comfort and security in their presence, with benefits also for the
psychological well-being of the individuals concerned and for the functioning of the social group. Seeing the other people that you know as willing sources of reassurance and support, and as recipients, too, should make the social group warmer and more cohesive. Seeing that people believe you are worthy to be loved and protected could be very good for your self-esteem. All of this affects your basic physiology and (probably) the expression of your genes.

Like Lorenz’s baby birds, human babies are not born ‘attached’ to specific adults (even though they may have learned before birth about the sounds of their mother’s voice and about her smell, and they have been affected by her emotional states, too). Up to about six months old, they will interact quite happily with pretty much any adult they meet, but gradually the caregiver who provides love and soothing and social interaction becomes the preferred source of reassurance in distress. Familiarity, consistency, responsiveness, and warmth seem to be the crucial factors. By the end of the first year, children will normally have at least one person to whom they are strongly attached. As the mother is usually the main caregiver, she is highly likely to be one of them, but children become attached to either parent, to their childminder or nursery worker, to siblings, and even to nonhumans – a favourite toy, pet animal, or a piece of cloth that smells of mum.

This developing preference for the familiar person intensifies over the second half of the first year, and now for several years most young children strongly prefer to be within reach of their attachment figure. They will seek to get close to this person when they are distressed, they will be less confident when alone, and they may protest about the absence of the attachment figure and the presence of strangers or if the attachment figure becomes preoccupied with something other than the child. They will probably enjoy games which play with separation, such as peek-a-boo or hide and seek, provided that they are not left to be frightened for too long and the attachment figure reappears reliably.

As they get older, children develop language skills, memory, better emotion regulation, and more mobility, and they become better able to tolerate being separated from their attachment figures. But in situations of great stress, it may be their attachment figure that they want to turn to, even years and years after the attachment first developed. My mother told a poignant story of how when she was twenty-six and giving birth to her first child, she cried out for her own mother, poignant because my grandmother had died the year before.

We saw that there is evidence of what is going on at the level of brain activity. Babies develop a buffering system against the disruptive effects of stress. The processes
involved may affect neurodevelopment, the immune system, and the expression of genes. Parenting influences regulatory processes in infants’ immature stress regulation systems. Many brain regions are still maturing during the middle of the first year, and this may change how stress regulation can function. For example although the HPA axis is active from birth, from around six months of age it also comes under the control of the amygdala and the hippocampus. Myelination of nerve fibres, especially in the limbic system, and sensitivity to the hormone oxytocin and to naturally occurring opiates are probably important here. The timing of brain development may be at the root of the timing of attachment development.

Individual differences in brain development may be part of what underlies the individual differences in attachment relations. For example, some babies have more left frontal lobe activity compared to right, an asymmetry which is associated with positive emotions, while other babies have more right frontal lobe activity, which is associated with negative emotions and inhibition. When we look at their attachment behaviour, babies in the former set tend to be in the category of ‘securely attached’, and those in the latter tend to be ‘insecurely attached’. It appears that there may be differences between brain responses to the stress of infants with withdrawn, normal, or intrusive mothers. EEG studies show that infants with depressed mothers are less likely to show left hemisphere activation. Insensitive mothering seems to be mediating between depression and EEG. A lack of sensitive parenting and a lack of maternal contact stress the infant and simultaneously remove the person who normally destresses the child.

How does a child develop a secure attachment, as most do? It helps to have warm, sensitive, responsive, and consistent treatment with cuddles and joint activity and mutual enjoyment and communication. If there is little of this, and especially if the parenting is very inconsistent and even frightening, the child’s feelings of attachment will fall into a different pattern. Differences in attachment show up especially clearly when the child is in a slightly stressful situation, for example being in a strange place without its attachment figure. Clinicians and researchers use the ‘strange situation’, where a baby and its attachment figure are observed in a playroom new to the child, and there is a sequence of social situations which involve the attachment figure temporarily leaving the child in the room with a stranger. Most babies between six months and two years find this somewhat distressing: they stop playing, try to follow their attachment figure, cry, and seek contact and reassurance when the attachment figure returns. For securely attached babies, the majority in most studies, the distress is real but not overwhelming, and the child is relatively easily reassured when the attachment figure returns.
Avoidant babies act as if they feel they cannot rely on the attachment figure. They are not responsive to parental attempts to interact with them, and they may even turn away to avoid them. They seem to deliberately divert their attention from anything that would evoke attachment behaviour and avoid relying on the attachment figure. If they are distressed by the strange situation, they cannot use the attachment figure to recover from their distress; their behaviour is tense and irritable and rejecting. They seem not to be comfortable in turning to the parent when they are under stress, as if they are not confident that the parent will be a reliable source of warmth and comfort. Typically, their interaction with their significant others has often been tense and irritable, with the adults being rejecting or intrusive and overstimulating. It looks as if the baby’s attachment behaviour is deactivated because it has not been a useful resource.

Anxious or resistant babies also act as if the attachment figure is not a source of security. They are not reassured by parental attention and comforting behaviour, and they have great difficulty reducing their distress, so it is hard for them to regain an emotional equilibrium. Often they are extremely dependent, clingy, demanding, and angry. They may make excessive demands on the attachment figure and have great difficulty in playing autonomously. They seem to not have faith in themselves or in their caregiver, and they are continually checking that everything is all right rather than getting on with exploring new possibilities. It seems that their attachment figures may have been inept or inconsistent rather than rejecting; hard to reach and insensitive rather than too much in opposition to the baby’s needs. It is as if the baby’s attachment system has become overactivated because he or she has not had a feeling of being reliably supported.

Disorganised or disoriented babies have not settled into a consistent attachment strategy. They do not behave coherently, showing signs of both avoiding the parent and resisting the parent, as if they had confused expectations or were depressed or afraid. They cling and avoid and resist incoherently, as if they felt both confused and fearful, angry and anxious, frightened and unresponsive. In some cases, their attachment figure has perhaps maltreated them or suffered from mental illness – really serious depression, for example, can be associated with disorganised attachment in the baby.

Long term, there is strong evidence that having a disorganised attachment predicts a high increase in risk of problems for the child later on. The relationship between anxious and avoidant attachment and later problems is less strong. It’s worth noting that there seem to be cultural differences in how frequent such attachments are that fit
in with cultural expectations, for example North German babies show a high rate of avoidance (or is it independence?) and Japanese babies show a high rate of anxious attachment (fitting in with the culture of amae or constant closeness between mother and child). But while being avoidantly attached or anxiously attached may have only a moderate link to later problems, it does seem to be clear that a secure attachment tends to be protective and a disorganised one often put the child at risk of problems.

So secure attachments seem to be facilitated by responsive, warm interactions between baby and caregiver, by an emotional environment that is positive and responsive in quality. If the caregiver is reliably sensitive to the baby’s needs, reliably anticipates what they will be, reliably provides for the baby, and reliably shows pleasure in the interaction between the baby and the carer (and by ‘reliably’ the researchers mean upwards of 30 per cent of the time, not 100 per cent), a strong positive attachment is likely to develop between them such that each will feel and show pleasure in each other’s company, have confidence that the partner is available and supportive and nice to be with, and have an ability to cope when stressful circumstances arise. Part of what is crucial here is ease of emotional communication, and I mean communication over negative as well as positive feelings. In a healthy relationship based on a secure attachment, the partners can express both positive and negative emotions safely, and do not have to censor or distort their emotions lest they put the relationship at risk. Some people talk of this as ‘unconditional affection’, but it also, I think, involves tactful honesty.

Many parenting frames are relevant to this, for example if you enjoy someone’s company there are more opportunities for joint attention, shared jokes, and supportive feedback. But a key part is learning how to regulate emotions and to stop arousal leading to loss of control. Babies have little ability to control their arousal, and caregivers need to look after them in ways that reduce distress and eventually provide the baby with ways to self-comfort. The experiences involved in developing a secure attachment can modulate arousal systems in positive ways, which may be embedded in brain functioning and patterns of stress hormones such as cortisol as well as visible in behaviour. The knowledge that one has reliable ways of reducing distress endures throughout subsequent experience. Later experience, however, can modify this certainty such that enough misfortune may reduce even the person with a history of secure attachment to anger or despair. But such a person will typically show more resilience than someone whose early attachment experiences were less than good.
PSYCHOLOGY
IN WHICH WE LOOK ESPECIALLY AT PARENTING BEHAVIOUR
Sara Meadows

For babies and very little children, this attachment is based on feelings, the pattern of interaction, facial expressions, tone of voice, touch, warmth, and so forth. As children develop language and reflect on themselves, cognitive and narrative levels of attachment come into play, but they do not displace the nonverbal constituents. Even as adults, we may find it hard to like the colleague who does not smile at us, does not make eye contact, ignores our actions, speaks in a harsh tone, appears to cross the street to avoid us; and a working model of such a person as disagreeable and untrustworthy can be hard to change. Similarly, although we may cope better with separations from the person we are attached to once we understand the reasons for the separation and that their absence is temporary and does not have to be interpreted as a final and irrevocable rejection, such experiences still put us at risk of distress, anxiety, anger, and depression.

Of course children’s characteristics, including characteristics derived from genes, affect the behaviour of their parents. For example, highly irritable and hard to soothe infants tend to receive less sensitive care and then have insecure relationships. Even sensitive parents may find that infant negativity makes attachment processes work less well. Attachment is enhanced when the child stimulates the mother and responds positively to her bids for interaction, and thus elicits more sensitive, warm caring and attention.

Bowlby himself pointed out that the attachment between a child and a parent “turns at each and every stage of the journey on an interaction between the organism as it has developed up to that moment and the environment in which it then finds itself”. More recent researchers point out that we should not assume that the antecedents, meaning, and consequences of attachments are the same across all cultures (and indeed all historical periods). The parent–child relationship exists within a nervous system, a family, a community, and a culture, and it will be profoundly affected by factors at these levels. I want to mention, briefly, two aspects of this: first, working mothers, child care, and the possibility of multiple attachments, and second, cultural differences in attachment.

Throughout evolutionary history, animals that parent have had to provide child care as well as getting on with their other activities. Nest-building animals leave their young in the nest to forage for food for themselves and their offspring; in some species the parents take turns, in some it is the work of only one parent. Human parents may carry their infants with them as they work to support themselves, or delegate infant care to particular individuals – sometimes just one parent, sometimes another family member who may or may not be of the parents’ generation,
sometimes to professional carers. Despite what I said about the importance of parental frames, total undivided focussed parental attention has been something that children have been able to expect, let alone to enjoy, only some of the time. Children have evolved to be able to cope with a certain amount of ‘benign neglect’, as my mother’s doctor told her when she was fretting about her first child. The ‘highly responsive’ mothers of securely attached babies were only responding about 30 per cent of the time, and getting it right presumably only some of that 30 per cent.

Historically, most care has kept the child in the normal social community, which allowed plentiful opportunities for keeping an eye on the child but may often have meant that attention to the child’s needs was intermittent because of the demands of the workplace or of domesticity – I am thinking of farm women’s babies stashed in the long grass at the edge of the field while the mothers worked to bring in the harvest, or the swaddled infant in a cradle which the mother rocked while she attended to her cooking. Rich families have used surrogate, part professional child care for centuries; English royal children, for example, were generally brought up by whole households of unrelated adults with grandiose titles and visited by their parents only once or twice a year. In traditional societies, an older child would often be a caretaker for a younger brother or sister. Most such child care will have involved fairly small numbers of children at the same age and, in most cases, carers with a relatively strong commitment to the individual child. Increasingly, twenty-first century infants and young children may spend time in groups with age mates in settings such as nurseries or play groups where carers are in loco parentis but on a less individualised basis and are trained professionals rather than family members. In our evolutionary and cultural history, this is rather a new thing.

There has been a substantial amount of research on what effect modern out-of-home care has on young children. There are consistent answers in some areas, less consistent ones in others. In almost all the large-scale epidemiological research, there is consistent evidence of preschool group experience having a favourable effect on children’s language and their development of the skills needed to work in school classrooms (‘school readiness’); the benefits are larger where children have encountered better quality group care. This is gratifying, but not very surprising. In most preschool groups, some attention is paid to school-like activities such as sitting in a group listening to a story, painting, taking turns, lining up to go and play outside, and so forth. The staff in such groups may behave like teachers, be called teachers, even be qualified as teachers, and may have an explicit curriculum of school-like skills and routines for the children to engage with.
There is a body of rather less consistent evidence that group care may sometimes have an adverse effect on social skills; children with experience of preschool group care are reported to show higher cortisol levels, more aggression or assertiveness, more anxiety, and poorer relationships with other children, possibly lasting for some years. This may perhaps be grounds for concern about the effects of preschool group care for very young children. However, it appears from the large-scale epidemiological studies such as ALSPAC that this negative effect seems to be detected mainly with vulnerable children, particularly those with poor family relationships and insecure attachments to their mothers. Group care can work well provided the child does also have an opportunity to develop personal attachment relationships.

It is clear that environments which are chaotic, inconsistent, understimulating, or emotionally cold are bad for attachment formation, whether they occur at homes or in group care. Over recent years, evidence has built up from studies of children reared in orphanages in the former Eastern bloc, including Romania and Russia. Care in these institutions typically involved little or no warmth and interaction between the staff and the babies, and the babies did not build up attachments to the staff. They were often retarded in their physical growth and their language development, and they seemed not to have learned to relate positively to other people.

The Ceausescu dictatorship in Romania, anxious to raise the birth rate, discouraged contraception and made abortion illegal but presided over high unemployment and increasing poverty. The result was that many parents could not take care of their children, and they were abandoned in bleak orphanages where they were not cuddled, played with, or talked to. When the regime was overthrown, a substantial number of the orphanage children came to the UK or Canada for adoption by Western families. Researchers have kept in contact with them and published a succession of reports. These children showed rapid physical and cognitive development, catching up to something like the UK and Canadian norms within a couple of years. Although there was enormous improvement in social and emotional skills, the children still showed a higher rate of problems than nonadopted children. Most of these adopted children developed more secure attachment relationships with their adoptive parents than they had been able to develop while in institutional care, but they still seemed to be more at risk of insecure attachments than nonadopted children.

The rate of behaviour problems, such as anxiety and aggression, is a little higher amongst adopted children than nonadopted ones, and the rate of referral to mental health services is markedly higher, but they were much lower than for children left to be reared in institutions or than for those children living with dysfunctional families of...
origin. The worse their pre-adoption experiences were, and the longer the poor experiences lasted, the more all adopted children appear to be at risk of worse outcomes after adoption.

Cultural differences in attachment patterns are an interesting possibility, and there is some evidence that they may exist. As I mentioned, studies of children from infancy to late childhood carried out in Germany used the strange situation assessment and found a higher-than-expected rate of independence of the infant from the mother, which under the conventional interpretation would be considered to show an insecure attachment. The German mothers, however, valued emotional self-sufficiency in their children, and the children had frequent experiences of brief separation in which they had learned not to be too distressed by their mother’s absence. On the other hand, Japanese mothers valued amae, a continuing emotional dependence of the child on the mother, and separations between mother and child were much rarer in their culture (it would be common for the child to sleep in the same bed as the mother up to age five, for example), and they approved of a degree of child dependence on the mother that Anglo-American raters would regard as problematic. Japanese children were expected to be very distressed when their mother left them in the strange situation and very clingy when she returned, even at the age of five, and far more Japanese five-year-olds than American five-year-olds behaved like this. Arguably, the strange situation was much stranger for the Japanese children, who would rarely have experienced anything like it, than for the German children, whose families were training them to be independent.

It is important to recognise that there might be cultural differences in the parental behaviours that underlie attachment. In particular, if mother and child are normally in close proximity, even in physical contact, the mothers may have more cues that the child is about to do something or need something than if they are physically further apart. Thus, mothers may have opportunities to anticipate behaviour sensitively as well as respond to it sensitively. Most of the research on ways of promoting secure attachments has been done in cultures where sensitive mothers engage their babies in a lot of face-to-face synchronised interchanges, games or conversations, or emotional soothing. Mothers who carry their infants on their backs will not be able to engage in this sort of face-to-face interaction so often; instead, these mothers frequently touch the infants, for example patting them or jiggling a protruding foot or hand. Recent small-scale studies of babies’ reactions to sitting in a buggy facing their mothers or facing away towards the outside world found that facing outwards went with somewhat higher cortisol levels, so perhaps it is more stressful; on the other hand, the mother-
facing baby may make strenuous efforts to turn away from her and see the fascinating street beyond. Some further research would be useful here.

The early attachment relationships between child and parent seem to have some influence on later peer relationships and friendships. Children who have had secure attachments tend to show more positive behaviour towards other children, while those with insecure or disorganized attachments show more negative behaviour – more frustration and inhibition for those with early insecure-ambivalent attachments, and more aggression and anger for those whose attachments were insecure-avoidant or disorganized. The suggested linkage between early attachment and later peer relations is complex. Research suggests that the child’s early experience of parental warmth, sensitivity, and responsivity induces a sense of trust in relationships and trust in oneself as worthy of a positive response from others; this leads to a secure, confident interaction style and active confident exploration of the world, which facilitates positive play with peers. The next step involves the positive exploration of ideas, perspectives, roles, and actions, and thus the development of positive social skills. ‘Mind mindedness’ – attention to other people’s cues about their internal mental and emotional states – might also be a key part of the sequence. Children who have had a poorer attachment experience, on the other hand, might feel and express less trust, more hostility, and more avoidance in their approaches to the world.

Looking at it the other way round, the parents of unpopular or peer rejected children tend to use more inept, intrusive, and harsh discipline and socialisation techniques. Parents of popular children display more reasoning about feelings, more responsivity, more authoritative control, more child-centered behaviour, more warmth. Children who are aggressive towards peers tend to have parents who model and reinforce aggression and show high levels of impulsive behaviour, inconsistent discipline, and rejection. While this pattern feels credible, the evidence base is limited, the size of the association is weak to moderate rather than strong, and the degree to which the attachment pattern and the peer relationships fit into wider social structures and experiences has not been thoroughly explored. What is more, the developmental influences of parents, peers, and others interact and modify each other. People can recover from attachment problems; I have known biographers infer that their subjects were spurred to outstanding achievement by an unsatisfactory relationship with parents. No researcher has found worse outcomes from a secure attachment, however, and the pleasures of loving your child (or your parent) and being loved back are undeniable.
Almost all children learn to talk without difficulty. It’s one of the big, exciting, and essential achievements of childhood. The first word comes (on average) a little while after the first birthday, and by the second birthday, the child will normally be rattling away, producing upwards of fifty words, combining words into sentences with grammar, and using language to convey and request information, to express feelings, and to control other people. By five or so, the child will have almost as much mastery of language as adults do. Although there are differences in how fast this happens, and of course in the details of the language, it’s rare for the process to be seriously problematic. This learning is also apparently spontaneous, near enough universal, and generally fast and free of effort. There is very relevant and well-grounded science on how this happens.

One relevant line of scientific inquiry involves comparing language in humans and in other species. Although there’s a long historical tradition of seeing language as unique to humans, or at least as vastly different from other animals’ languages, careful observation of what other animals do has reduced this uniqueness. Many other species communicate with each other to exchange information and to operate the social hierarchy – for example bees do a wiggle dance to tell other bees where there is a food source, other social insects use pheromones to send messages about sexual availability. Many species use vocal noises (‘speech’) to do this – for example birdsong, whale song, and alarm calls in birds and monkeys. Many species can combine their different vocal signals in rule-governed or topic-specific ways: vervet monkeys and prairie dogs give different alarm calls depending on whether the threat is from a land-based predator or one in the air, and the other animals respond accordingly. Some species can use their language to talk about things that are distant in time and space; for example monkeys or birds may continue to make alarm calls well after the threatening predator has left. Primates have been seen to deceive others, possibly through vocal communications, and certainly by omitting vocal communications. So most things that humans do with language are not completely exclusive to humans.

However, humans have languages that include much larger vocabularies and more intricate grammar than any other species, and we use language in more complicated ways (so far as we are aware). The sharing of language with other species suggests that human language has its roots way back in evolution, that it will have evolved because it is useful, and that there are probably genes and brain structures that support it. Human hyper-development of language must be built on these foundations, but it goes far beyond them.
What do we know about the evolutionary history of language? Not a lot is certain. There are debates about evidence for brain lateralisation (which could be relevant as modern humans have language areas located in the left hemisphere, which also tends to be a bit larger than the right hemisphere) but there could be other reasons for lateralisation (as it is there to some degree in the fossil skulls of much earlier creatures, for example prehistoric sharks). The earliest date when there is evidence of human symbolic activity – art, religion – is relevant because it’s difficult to see how early humans could have gone in for these activities unless they had language to talk about them. But the dates are much debated, and presumably the language use preceded the invention of symbolism, probably by millennia.

There is evidence for anatomical specialisations which would allow humans better control over the vocal apparatus. Compared with other primates, modern humans have an enlarged spinal cord in the region where the nerves that control the diaphragm and the chest wall leave the spinal column; this would mean more control of the diaphragm to allow long steady speech-carrying breathing out. They also have a larger space at the base of the skull for the nerves that control the tongue and mouth, which could allow finer movements and better articulation. And there are differences between other primates and early and modern humans in the position of the hyoid bone and in the ear canals, which would help with the production and the perception of speech sounds. The fossil record may date the possibility of speech that could have sounded like modern human speech to around 500,000 years ago; our ancestors would have shared this sort of speech with Neanderthals and probably earlier hominins. Dunbar also argues that the increasing size of social groups would have pushed for further language development (to communicate better) and encouraged some specifically human uses of language, for example to tell stories, to socialise, and to develop the idea of other people having minds like one’s own. These last points I will come back to later.

Are there genetic bases for language development? Yes, obviously: from the anatomical level of being able to produce the sort of language that we do because of our hearing, our mobile faces and lips, and the structure of our larynx; to the abilities that we have to remember, to discriminate between other people, and to live in social groups; there have to be genetic programmes which make these things possible. There has also been evidence about genetic anomalies that seem to underlie some specific language impairments. A mutation in the gene FOXP2 seems to be behind the language disorder developmental verbal dyspraxia. Individuals with this disorder have severe difficulties in planning and producing the delicate and complex facial
movements required for speech. Animal studies find the same mutation causes changes in vocalisations in mice. FOXP2 has a role in controlling other genes, however, and other genes are certainly involved in building a brain and body that can produce speech. A recent study reported on the ‘JR’ family, who had severe difficulties with language-based tasks such as naming pictures and defining words – ‘I know what I want to say but I can’t quite get to the word.’ The pattern of which family members had difficulties suggested a genetic inheritance, and neuroimaging revealed that the individuals with the language problem also had abnormalities in brain regions known to be involved with processing the meaning of words. I would expect that future research may well uncover other links between serious language difficulties and brain development, though minor language variations may be harder to attribute to genetic anomalies.

What, if anything, is wired into the brain? Neuroscience studies have identified regions of the brain that are specially active in producing and understanding language, and from birth onwards, they are considerably more developed in humans than in other species. Specific regions (mainly in the left hemisphere) are specialised in dealing with particular aspects of language. Where language develops abnormally, it is sometimes possible to identify abnormalities in the brain too, as in the case of the JR family that I just mentioned.

We do know that very young babies selectively attend to the speech they can hear and can show discrimination between certain of its features. For example, consonant discrimination is probably a result of wired-in sensitivities in the brain’s sound perception, as humans share it with some other species such as the chinchilla. But the brain’s sensitivity to contrasts is altered by whether they mean anything in the native language. If they’re not used, the potential to use them is gradually reduced. Babies during their first few months can differentiate between such consonant contrasts as /s/ or /z/, even if the community they are growing up in does not use this contrast. (English speakers distinguish between sit and zit, but Spanish speakers don’t.) If the language that the baby hears does not use the consonant contrast, from around six months of age they seem to gradually lose the ability to hear it readily, and by adolescence they have difficulty in deliberately producing the consonants differently. This is part of what makes learning a new language difficult: the later that people try to learn a new language, the harder it will be for them to learn its sounds adequately. Exposure to more than one language will probably help children retain a wider range of discriminations between speech sounds.
Given that language has evolved and has genetic and brain bases, what else matters? Epidemiological evidence on language development suggests that simply the quantity and quality of language the child gets is associated with differences in the language that is developed. For example, the twins in the ALSPAC sample showed slightly retarded language development, as is often the case with twins. By carefully excluding other possibilities – such as health differences due to twins usually being smaller at birth and more at risk of perinatal complications, or twins talking to each other in their own invented language – the study team established that the delay was probably due to each twin getting less involvement in talk with adults than a single child would. The parents living with twins increased the total amount of talk over what the average single child would hear, but they were unable to double it, so that on average the twins had enough less involvement in talking with adults to account for their slower language development.

Children who are brought up to be bilingual, so that they hear more than one language but not so much of each language as a monolingual child would do, tend to be slower in the initial growth of their language, especially their vocabulary, but in the end they have advantages in awareness of how language works (as well as the advantages of not having to rely on the patience of others when they travel abroad, or do the stereotypical English thing of speaking in English very slowly and expecting to be understood).

Large-scale American studies of language development in families across the range of social classes and educational levels have found that children who heard a larger amount of parental talk developed language faster; and there tended to be big differences between parents of different socioeconomic levels. But we need to be careful about interpreting this as ‘more talk is better’, for complex reasons.

At the extreme, children who are extremely neglected, who do not hear language, or who are not involved in language by their caregivers very often show serious deficits in learning language. ‘Feral’ children, whose early lives are spent without parental care and conversation, and the neglected children brought up in regimes like those in the Romanian orphan studies, typically have a serious lack of language when they are rescued. If the deprivation has been all-pervasive and lasted for a long time, the child may not develop normal language even after years of normal exposure to language. The famous case of ‘Genie’ is an example. This little girl was isolated and abused by a psychotic father who had decided that she was defective. He confined her to a small room where she was tied into a crib and from before her second birthday to the age...
of thirteen she was rarely or never talked to or played with. When rescued, she had very little language. She was looked after by a succession of foster parents and observed by a succession of researchers, and in their care she developed better communication skills, but although her vocabulary increased and she understood other people’s language better, Genie has not developed a grammatically organised language comparable with a normal child’s. So, again, extreme deficit is a bad thing.

However, it would probably be a mistake to conclude that differences in amount of parental talk nearer the average lead to better or worse child language. In the first place, the relationship is likely to be two-way – more child talk inducing more parent talk. There is also the big issue of enjoyment. Being talked at is no fun compared to talking with, even when you are very young or incompetent at language. Being ‘taught’ and ‘assessed’ all the time is no fun either.

There are several sets of data which suggest the association between amount of involvement in language and developing language skills is not one-way. There are, for example, children who have heard much less language than usual because their parents are deaf, but have normal hearing themselves and develop language normally; and there are children who have been talked with a normal amount but have specific difficulties with language (SLI). Their difficulties vary in type, but for a substantial proportion, their most obvious difficulties are with the rule-like aspects of language, for example phonology and syntax. It seems possible that some children with SLI have got stuck on immature strategies of analysing words and so have only cumbersome attack skills for new words and an inefficient way of storing and retrieving familiar ones. The representations of language which underlie their behaviour may not work very well, which means they use up more processing capacity and are more likely to break down when the language system is heavily burdened with other tasks; reading is often fraught with difficulties for them.

Studies of brain development cast increasing light on the problems of children with SLI. They sometimes have obvious evidence of gross brain abnormalities, so it does seem possible that there are subtle differences in regions relevant to language functioning when comparing children with SLI and normal language users. Worse phonological awareness in young children seems to be associated with less asymmetry favouring Wernicke’s area, a region critical for language comprehension. This might be a result of subtle genetic differences such that brain development is not quite set up for language development right from the beginning, so that the connections that are made in the brain are unusually arranged even prenatally. This
explanation would fit in with the tendency for children with SLI to have parents and siblings with language impairments and with the fact that SLI is not as easily recovered from as localised brain damage. There is a strong environmental effect on both normal language development and the incidence of specific language impairment, but also considerable heritability for being in the bottom 5 per cent of the language ability distribution.

Where there are neurological differences between children with SLI and children developing normally, these might be due to differences in development before birth, but they could also develop postnatally as a result of abnormal language input. If the child does not, for some reason, receive or attend to social interaction and parental communication, the regions of brain that are waiting for this input may not receive enough of it to have evidence to activate the left hemisphere brain mechanisms that normally analyse phonological or grammatical structure. Sometimes the regions crucial for phonological processing may be partly turned over to other tasks; deaf children who have learned to communicate with signs, for example, seem to use language regions of the brain for analysis of sign movements rather than the sounds they cannot hear and do not need to analyse.

Children use information about regularities in the language that they hear from birth. I’ve mentioned babies’ recognition of familiar individual voices and of sounds characteristic of their own language; they also learn to pick up the stresses and emphasis that signal what’s important and to use the gestures, facial expressions, and changes in pitch and volume that go along with parent–child conversation. With accumulating experience of language, of course, they become better and better at doing it.

Children’s production of sounds and then words is highly predictable. Its timing is a product of physical maturation increasingly modified by experience. It takes time for the infant’s vocal apparatus to develop to the adult state. Initially, the larynx is high up in the throat, engaging the nasal passage, so that the infant is able to drink and breathe at the same time (very useful to someone who does a lot of suckling). By about three months of age, the larynx has descended in the throat, the pharynx has opened up, and there is scope for the tongue movements that are necessary to produce the full variety of vowel sounds (and increasing control of the complex set of muscles involved). Early sounds may unintentionally signal the baby’s emotional states; parents, of course, use them as if they do.

Babies begin to play with sounds, producing a larger and larger range, play that appears to be for its own sake rather than involved in any attempt to communicate.
How the parent responds to the baby’s earliest practice with sounds doesn’t seem to affect what sounds they make or the speed or direction of their later language development. If the parents want to make noises back, fine; if they don’t, also fine, provided they are attending to the child in other ways, of course!

Around seven or eight months, babies start to combine vowels and consonants, usually producing ba-ba, ma-ma, da-da sorts of sounds. Many languages use these sounds as names for things relevant to babies, because they are babbled in much the same way across languages. A baby randomly producing a babbling noise which is also a name for a significant person in the native language may get a great deal of reward from its adults, who believe, or act as if they believe, that the baby is now addressing them by name. Quite a lot of parents enthusiastically babble back at their baby. This sort of social reward does not increase specific noises in babble, but it may increase the amount of general babble and the proportion of babble that is produced as a social activity rather than a solitary one. A wide range of sounds are produced in babbling initially, but by about ten months of age, the range is narrowing to include mainly those sounds which the baby hears produced by other people.

The stable sequence and timing of speech sound production to the babbling stage in virtually all children suggests that there is a high degree of genetic programming and maturation involved. However, experience is also necessary. Children born deaf start to make babble sounds but commonly give it up, presumably because they cannot hear themselves. If their parents are fluent users of a sign language and sign to the baby, the baby will ‘babble’ manually, probably at a slightly younger age than a hearing baby starts to babble vocally, perhaps because the muscular control needed for signing is easier for the baby than the muscular control needed to articulate speech. Signs may be invented as well as imitated.

From around the first birthday, infants begin to produce what we could call ‘words’, sounds which are consistently linked to a particular event or object and might be performing at least some of the same functions as an adult’s word. You may remember me telling you that my daughter’s first ‘word’ of this sort was /wow/, which we first noticed when she looked at a dog [in her father’s talk to her, a ‘bow-wow’] running round in a local wood. Goodness only knows what exactly ‘wow’ meant to her at this stage: an imitation of the dog’s noise or of her father’s comment, or a true reference to the creature or something about it, or even the sort of superlative that ‘wow!’ is to an adult [she has grown up to be much keener on dogs than I ever was]. But the ‘word’ being linked with a particular sight [dogs running about] and being a derivative of an adult’s conventional word is pretty typical of first words.
Early words are commonly simplified in sound; indeed, the same sound may be produced in different contexts as different words – ‘da’ could mean dog, or duck, or daddy, depending on which of these interesting creatures is present. The context makes the word unambiguous. The ‘first words’ follow from a period where babies have shown understanding of words in adults’ speech, have built up a vocabulary of twenty to fifty words that they understand but don’t say, and may have produced idiosyncratic words (some of which go unrecognised).

By the second birthday, the vocabularies toddlers use will probably have upwards of fifty words, perhaps into the hundreds. Most early words are names of familiar people, objects, animals, food, toys, body parts and functions, and social routines, or social phrases such as ‘bye-bye’. Importantly, they’re used to get what the toddler wants, to regulate others’ behaviour, to make or keep a social contact. The child saying ‘ice cream!’ probably means something like ‘I can see a source of ice creams and I want one right now.’ Only an unwise adult would think that the small child is disinterestedly naming the ice cream, rather than trying to bring about the desired outcome of getting some to eat. Children very quickly learn that words are powerful ways of controlling other people, fortunately for the adults who would like to use words to control the child; and eventually toddlers manage to use words to talk about themselves, to find out about the world, to inform others, and to pretend.

Parents’ talk to children is often adapted to what the child can understand and produce, possibly because that is a specially good way of keeping communication working smoothly. From infancy onwards, parents often label the thing a child is already attending to: ‘that’s a doggie’. Or they may draw the child’s attention to something by gesturing and labelling it at the same time: ‘look at the doggie’. Establishing joint attention between oneself and the other person is one of the most important achievements of infancy (and one of the key problems of autistic children). Most young children monitor their parents’ attention and react to new words accordingly.

Parents also talk about contrasts: ‘you’re not big, you’re little’ and ‘that’s not nice, that’s dirty’. Differences in parents’ use of such talk, and of labelling objects in picture books, are associated with differences in the rate of language development. But, as I just said, everyday talk involves parents adapting to the child’s own language, so children who are already good at these things may get more of them, and children whose development has not advanced so far may get less. ‘Association’ is not water-tight evidence of cause.
If the adult has a particular interest, or recognises the child’s interest and encourages it in the child, this may lead to enormous vocabularies in the special subject. There are numerous studies relating vocabulary content and rate of growth to the topics adults talk about with the child. Almost invariably, if the adult and child converse about a subject more than average, then the child’s vocabulary in that area will tend to be larger and more useable than average. The child’s thinking in the area may be more advanced, too; possibly having more vocabulary about a topic makes it easier to think about it. I think it’s important to recognise the intertwining of children’s language development and their cognitive development and their social interactions, with influence going in all directions between them. The enormous creativity of human language stems from vocabulary but also from the possibilities that it offers of new combinations of vocabulary items to say things that have never been said before. Word combinations are rule governed. There are rules about combining units of meaning smaller than words into words (for example *talked* combines *talk* and the past tense morpheme *-ed*, *handbags* combines the morphemes *hand*, *bag*, and *-s*); rules about combining words into grammatical phrases, clauses, and sentences; rules for combining sentences into more extended speech (or written text; these rules may be slightly different, typically more elaborate).

Children slowly construct grammar from the language they use and hear. Some early words look like grammatically constructed phrases but are more likely learned as unanalysed chunks. Social phrases such as ‘How do you do’ or ‘S’il vous plait’ are examples. Or the child may often use ‘fill the blank’ structures. Children can become fluent producers of language using these sorts of slots, but they are skilled users of specific structures rather than possessors of an abstract or generalised grammar. What they have really learned is where to place words within certain familiar recurring patterns; progress towards an adult abstract grammar is piecemeal and gradual. Parental emphasis and systematic contrasting may help with both understanding and producing grammatical utterances, but in everyday life, the main criterion is whether the speech has the desired effect. Some syntax is more difficult for both children and adults; for example passive sentence structure and metaphor, which are rare in normal talk to children, continue to confuse them for years past the point at which they can deal with simple declarative sentences and questions.

Quite a lot of the support system for children’s language development is outside language itself, in their interaction with more skilled language users who are keenly interested in talking to them and listening to them. Early joint attention, turn-taking, looking at picture books, and naming objects all figure heavily in the interaction of
Western middle-class babies and toddlers with their parents. They facilitate vocabulary growth and knowledge about language, especially perhaps if they are accompanied by the specialised sort of language which has been called ‘child-directed speech’ (CDS). This is directed in two senses: it is addressed to children, directed towards them, and also it is in part directed by them, in that it is contingent on what they are heard to say and believed to understand, and on what they are known to enjoy.

Western middle-class parents are highly likely to use CDS to their babies and young children most of the time. The adult’s language is closely linked to the child’s current stage of cognitive and linguistic development because this is what works to keep everyone chatting happily. It is evoked by the child as well as provided by the parent. Parents adjust to what they can see the child understanding – after all, most talk is there to control, amuse, and communicate with the child, not to teach it language.

While the child is only at the beginnings of using language, the parent will do almost all the talking, playing both roles in the ‘conversation’. For example, the talk that goes along with looking at a picture book will involve the adults saying ‘What’s that?’ and straight away answering their own question with ‘That’s a teddy!’ The next stage is to leave a little pause which the baby is expected to fill, but whatever noise the baby makes, the adult reacts as if the response was correct – baby says ‘ba’, adult says ‘yes, it’s a teddy!’ Gradually the baby is given responsibility for producing closer and closer versions of the right answer, until the roles become more and more equal, and eventually the adult is asking genuine questions so the child has to give new information in full. This CDS is an example of ‘scaffolding’, a particularly useful parental frame.

All fruitful parental talk is based on what works and on beliefs about what children are like, how they should learn, and for what purposes and by what methods they should be socialised. There are different ways of talking with children besides CDS. In some societies, adults may ignore children conversationally until they are older. In other social settings, children are allowed to observe normal adult language, are encouraged to perform, and are challenged to use language in an adult way. They have a role to play and culturally appropriate ways to play it, and they learn these by imitating the social participation around them.

Children grow up into normally competent language users apropos their culture even in groups which rarely or never use the sort of CDS that I have described, so it cannot be necessary for language development. Children are able and willing to learn from
whatever language they encounter, to seek out meaning and knowledge actively as well as to imitate their partner’s behaviour. They may have other interactional and conversational partners, such as siblings or older children who are their caretakers, and they are likely to have developed language which differentiates between partners of different skills and status and willingness to work to understand the child.

Child-directed speech and parental input may have different effects on different areas of the child’s language. Vocabulary, topic understanding, and social routines do seem in many instances to be closely related to amount of parental input in that specific area. Elizabeth Meins, for example, links mothers’ talk about people’s mental states with children’s abilities to talk about minds. Specific effects on syntax have proved more elusive. It could be that the grammatical basics of language are more strongly wired in than other aspects of language or are even universal, as Chomsky and more recently Pinker argued. But even here it’s unquestionable that children get a lot of exposure to models that are at least approximately grammatical, over more years than Chomsky allowed for, and the basic programming might be simpler and not specific to language – memory for regularities and for what worked, for example.

Children learn that language is useful. It’s a source of information, a means of expression, and a way of communicating with others – a rewarding social activity. Sooner or later, children who do not use language fluently, or who avoid language, will be at a disadvantage. Conversation with adults allows children to practice taking turns, listening as well as speaking, and other social routines, all socially valued skills and essential once you get to school. Practice in making yourself understood may help improve the intelligibility of the child’s pronunciation, and it may be useful to have to reformulate utterances that have not been understood as the child desired. Conversations with interlocutors who do not know the child quite well enough to work out what an unclear utterance means could be particularly helpful here.

In the end, it would seem that different ‘routes into language’ result in a broadly similar sequence of language development and broadly similar levels of language competence. But the emphasis is on ‘broadly’: there may well be differences which seem small in themselves but have far-reaching effects. Differences in orientation to literacy are one example of a language difference with long-term developmental significance. The meeting of home language and the school is another. School is full of teachers who ask questions to which they, as teachers, know the answers; the point is to make children display whether they know the answer. Display questions are quite rare in ordinary talk and are socially tricky: if someone asks you something
and you know they already know the answer, you’re inclined to think that you’re being tested (unpleasant) or that something hidden is meant (also unnerving). But CDS uses display questions in the naming game and the picture book game, so children who’ve grown up with this can take them for granted.

I think language learning obeys the general laws of cognitive and motor development. Like everything else that we do, it stems from and is shaped by both biological and social influences. Children have mouths, larynxes, and so forth that they can use to produce a tremendous range of sounds, and ears that can hear them. Under reasonably favourable conditions they are deeply curious and extremely interested in understanding, categorizing, and generalizing what they experience. They seek out contrast and notice equivalence. They observe and they imitate and they socialise. They have brains which allow and expect these sorts of behaviours. They use these proclivities when they are attending to other people’s vocal behaviours and when they are producing their own. They want to communicate with others. Their caretakers are strongly interested in them acquiring the language of their community and using it in socially approved ways. Over the first year of life and during the preschool years, their ability to talk opens up all sorts of enjoyable possibilities for them – chattering, story-telling, narrating, memorising, arguing, sharing interests, and reading. These can be enjoyable possibilities for their parents, too.

We are all expected to become competent readers and writers nowadays, but we haven’t evolved to be. Reading and writing are recent inventions. Although literacy is obligatory now in Western cultures, six generations or so ago most Europeans could not read much more than their own name, and only a very small minority would be literate in the way we expect everyone to be now. Evolution has not had time to select on the basis of an ability to read and write. We may be able to identify evolved characteristics that literacy is based on, but they evolved initially because they provided other advantages. Reading and writing may not be as easy as talking or walking, which have a longer evolutionary history. Experience, and especially socially provided experience, will be crucially important in how easy a child finds it to become literate.

Thus, it is completely unlikely that we will identify genes for reading, though we might identify genetic differences which are, say, associated with differences in distinguishing speech sounds and hence to differences in ability to learn to read. It is unlikely that there are brain regions that are specialised for reading, though there may be brain regions which are heavily used when we read and these may work better in good readers than poor ones (but remember, however readers’ brains are wired at birth, brains change in response to the experience they get).
The language that we read, when we read, is a visual representation of spoken words, and the spoken words are sound-based representations of things in the world or ideas. Both spoken words and written words are presented to us in organized sets—utterances, speeches, sentences, paragraphs—built up from smaller items to larger ones, and not necessarily built up in the same ways in written language as in the spoken language that we learn first. A spoken word will consist of one or more speech sounds [phonemes] and perhaps an intonation pattern and will be separated from other spoken words by a little bit of silence (generally). A written word will be built up of parts which represent speech sounds [graphemes], and words will be separated from other words by a bit of white space. Spoken words are organised across time, not space, and pass by us just as the time passes by; written words are organized in space which we examine across time and can easily reexamine in more time.

All this means that reading written words is an activity involving links between the real world, conceptual worlds, and language structure, complicated by changes in sensory modality between hearing and seeing and in time scale from near-simultaneous to permanent. To be able to read, we need a lot of language knowledge, we need to make fine visual discriminations and identify the words we see written down, we need to move our eyes appropriately over the text, and we need to remember considerable quantities of information. Clearly it is, as Uta Frith says, ‘a complex and astonishing accomplishment’. And we expect all our children to learn to do it.

The first point I want to make is that there are different sorts of reading. We may only need to get the gist without worrying about implications, inferences, or sounds, or we may try to achieve exact pronunciation of the words, access to their deepest meanings, comparison with other texts. Reading is not a simple activity, though it does feel simple once you can do it.

Skilled readers with years of experience have read most of the words they encounter many times over. The links between the letter string c-a-t and its sound and what it refers to are so overlearned they are automatic and fast. Only when the text is very difficult or conditions are very adverse—too short a time, too little light, minute print, really distorted handwriting, poor motivation, tiredness—will skilled readers misread a word in the sense of not understanding it. They will probably not make a conscious analysis of words beyond the initial rapid recognition, and they will have difficulties spotting minor errors in spelling because they go from what is on the page to what it means so easily. Skilled readers rarely have to do more than scan the page, and they may well understand what is written there without having to process much of it.
Consciously. Sometimes we have to deliberately slow down our reading in order to, for example, be sure we are being fair to the student whose work we are grading.

If skilled readers meet a new word, then they have to do something a little different from fast automatic recognition of word and meaning. Occasionally they may work out the sound of the word from its constituent units, recognising it as a word which is familiar as a heard word, though never before seen. (This is hard to illustrate in writing, but if we hear the commentaries on international football matches on television before we read the names on the footballers’ shirts, we may perhaps process players’ names in this way.) Skilled readers faced with a new word may find analogies in other words – caterpillar, for example, divides into familiar parts. If all this fails, the reader may not be able to do much more than guess or access the meaning from the context or use a dictionary.

Children at the beginning of learning to read do not have a large store of overlearned words where they can link written symbol, auditory symbol, and referent instantaneously. Nor do they have a large store of words whose sounds they know are analogous to each other. Nor do they have much practice in breaking down words into their constituent parts. This is particularly difficult in English. Some languages (for example Spanish) have a nearly unambiguous relationship between how a word is spelled and how it is pronounced, and children find it relatively easy to learn to read and spell in these languages. However, many English words break the normal correspondences between grapheme and phoneme. Almost every written letter can be pronounced in more than one way. Even combinations of letters can be pronounced differently, for example the -ough in bough, cough, dough, through, and so forth. The English spelling system is extremely informative for a native speaker who knows its rules and something of its history (as English has flourished by adopting words from other languages with something like their native pronunciation), but it is better suited to adult fluent readers than to children learning to read. Children bilingual in Spanish and English progress faster in reading Spanish than in English.

What do beginning readers do, then? Can we describe common strategies or common stages in becoming able to read? Normally, children begin to learn to read having already learned to use spoken language. They have a heard or spoken vocabulary of hundreds of words. They may have played with sounds as nursery rhymes do, and as some babies and children do spontaneously as they first learn to make speech sounds. Both vocabulary size and knowledge of nursery rhymes predict the ease with which children learn to read; in both cases, the children with the most limited knowledge are the most likely to have reading difficulties.
Epidemiological evidence shows significant associations between parents’ and children’s interest in literacy, particularly the frequency with which stories were read to the child during the preschool years and the child’s progress in learning to read. Even when all sorts of other possible influential variables were allowed for, the amount that parents read to the child or taught education-relevant things, how often the public library was used, and the number of books the child owned made independent contributions to the child’s reading readiness at school entry in the ALSPAC sample. (And it was also the case that more book use was associated with a lower level of behaviour problems.)

Children who learn to read early, and easily, have generally acquired very early a good understanding of what reading is about in general, and about such specific aspects as that you go along the lines from top left to bottom right; that the message is in the text, though the pictures may provide clues; what things called ‘words’ and ‘sentences’ are; and so on. Children who have had less opportunity to learn about books have ground to make up when they begin to have formal reading lessons; they have also had less opportunity, perhaps, to learn that reading gives you access to interesting information and enjoyable stories, and thus they may be less motivated to work at learning to read. I’m a lifelong reading addict. Sharing my family’s interest in books is one of the positive memories of my childhood; reading to my daughter, from the earliest days until long after she could read herself, was one of the many delights of being a parent. An occasion when I looked up from reading The Hobbit to find her almost hidden under the bedclothes, her eyes like saucers, enjoyably terrified, is an especially proud example.

But although some children ‘pick up’ reading painlessly, many don’t, so it’s worth looking at why not. Which reading skills most often present problems? We have to see the differences between letters – rarely a problem. Unless the amount of text we have to deal with is very small (ten or twelve letters or spaces), we have to move our eyes over the text. Most children can perform the right sorts of eye movements. The necessary visual skills begin in infancy and run smoothly in most children. The uses to which visual processes are put may well change as development proceeds, but the basic visual capacities are functional very early. In fact, although poor readers are not so good at visual processing as good ones, this seems more often to be due to them having less experience as readers rather than being the cause of their poor reading in the first place. They do not read worse because they cannot distinguish letters, they distinguish letters worse because they read less.
In the earliest stages of reading, most words which the child can read are in fact probably dealt with by recognising either their shape or their standard sequence of letters; many children are taught very early on to recognise their names, for example, and the environment has many written patterns such as ‘stop’ or ‘exit’. Throughout later stages of learning to read, the presence of a particular letter or combination of letters which distinguishes a particular common word may be taken as a sign that the present word is the known one, even if the other letters in it are not quite right. There are many examples in Winnie-the-Pooh. Pooh receives Piglet’s urgent message in a bottle requesting rescue from a rising flood, but misreads the written word Piglit as his own name, because it begins with P. Consequently, he misinterprets the message as a personal message to himself, and it is only when it is taken to Christopher Robin, who is a more advanced reader, that it can be acted on appropriately. Similar errors are documented in the research literature about real children.

As I argued earlier, fluent adult readers read using their sight vocabulary, words they recognise at sight without analysing them much and often from only partial cues. Commonly, children begin reading by building up a sight vocabulary. Typically this includes interesting often-used words, such as their own names or the distinctive logo of some interesting place or product (commercial companies exploit this ruthlessly). Early reading schemes sometimes restrict themselves to a simple and repetitive vocabulary to enable children to build up sight vocabulary – we enjoyed a brilliant series by Allan Ahlberg when my daughter was small. Sight vocabulary is a useful basis for learning to read. Its problem is that it only works when the word that is met is already visually familiar. What can you do when you meet a new word that is not yet in your sight vocabulary?

If children are to extend their sight vocabularies, there are really only two ways to do this. One is memorizing each new word by rote, which typically takes a long, long time, but if your language is written in characters (Chinese, for example), it’s what you have to do. The other method, potentially more generalisable, is to analyse the constituent parts of words in terms of sounds. Knowing that spoken words are made up of sounds, and written words are made up of letters, and having a writing system with a fairly simple correspondence between letters or groups of letters and the sounds they represent, enable the reader who meets an unfamiliar written word to make a good guess at how it should be pronounced and then to recognise the pronounced word and access its meaning.

To do this, the child has to recognise letters or letter groups and know what sounds are associated with each. There are a number of related skills. These include
phonological awareness, which refers to the understanding that spoken words consist of individual speech sounds (phonemes) and combinations of speech sounds (syllables, onset-rime units); phonological decoding, that is the application of letter-sound correspondence rules; spelling ability; and verbal working memory. There’s been masses of research, and although there is disagreement over details, there is an agreed general picture of poor phonological processes being very damaging to a child’s chances of finding it unproblematic to learn to read, crucially in English and to some extent even in languages with a more regular relation between written symbol and sound, and even in writing systems based on characters.

Coping with a writing system that uses grapheme–phoneme correspondences is not easy unless you already know quite a lot about language sounds, even if the grapheme–phoneme correspondences are simple and predictable (as I said earlier, in English they are anything but simple). Before they read, children may delight in rhyme and alliteration and nonsense words. I don’t think it’s an accident that nursery rhymes so often play with word sounds – ‘Baa baa black sheep’, ‘Sing a song of sixpence’, ‘Humpty Dumpty’. Children who’ve learned a lot of such rhymes seem to be advantaged when they come to learn to read; perhaps their brains have learned to be more aware of speech sounds than people who are not so experienced with them.

Children who are very poor phonological processors before beginning to learn to read are likely to have difficulties; training that improves phonological processing improves reading. These paired findings, that poor phonological processing precedes reading and that remedying it improves reading too, show that the poor phonological processing of poor readers is a cause not a consequence of their reading difficulties. Poor readers probably tend to have limited vocabularies, low enjoyment of reading, and low levels of educational success as consequences of their poor reading; poor phonological skills, in contrast, precede poor reading even though they may also be made even worse by it.

So, paradoxically, learning about phonics can help a lot with building a sight vocabulary so big that you will rarely need to use phonic analysis in order to read. This is why there has been such an emphasis on it in schools. Sometimes it’s forgotten, however, that as readers get better, phonics will rarely be necessary, and it has also been forgotten that if a child is already reading well without phonics, having to do the phonic analysis may get in the way of the reading. The route between phonics and ending up as a good reader is largely through avoiding becoming a poor reader at an earlier stage.
Reading includes many different activities at different perceptual, linguistic, and cognitive levels, and these may well operate in different ways as the reader tackles different tasks. I think it is important for parents to recognize this, and teachers too. It doesn’t help children learn to read if too much of their experience of reading is them being under pressure to get every single word decoded correctly, and they rarely get to enjoy the text for its own sake. Virtually all children who feel books are enjoyable and useful learn to read successfully, and may like me be addicted. And reading together and discussing what you have shared in the reading can be a source of excellent bonding and discussion; you can get affiliations and attachments that in turn shape further activities and experiences, including more experiences with literacy.

Ever since the beginnings of literacy, adults have developed texts to socialize children as well as to entertain them. Children often play out the story they have been read in social pretend play. My daughter at age three was very enthusiastic about pretending to be Sleeping Beauty and Snow White; both roles involved her lying on the floor with eyes tight shut and a smug smile on her face while her role-play partner had to do all the other parts, finally ‘waking her’ with a kiss. This irritated me immensely, so I provided an intensive course of stories with more feminist themes, such as Molly Whuppie who saved her family from the wicked ogre by tricking him into killing his own daughters, and various clever girls who outsmart the male baddies, with probably some effect (she has grown up to be an ardent feminist who thinks that Molly Whuppie was lacking in sisterhood towards the ogre’s daughters).

Relationships between parents and children enrich and are enriched by sharing a bedtime story. Sharing out roles in pretend play, or identifying with the characters of a story, can be contributors to the life of the family or the friendship group.

You don’t have to agree on the messages you draw from what you read, or even on what you read. To be honest, when my daughter loved a book that I despised, I did try to keep her preferred book out of sight or to negotiate that I would read it if I also got to choose a book I liked. As she has grown up, we have discussed why we thought something was good or bad, and tried out each other’s recommendations; the birthday presents she gives me always include some of the latest literary novels. The social and emotional ties you have with your reading partners and the enthusiasm you have for the books you read may interact – we read something because it is admired by someone we like or even revise our rating of a person because unexpectedly they like or dislike a particular author or text. Experiences such as these are part of forming one’s view of one’s self and of other people.
I turn now to look briefly at the psychology of parent control of children and children’s self-control. There are many occasions when ‘mother knows best’ and parents need to control their children. But children also have a strong drive to function autonomously or to achieve mastery, all the way from ‘I want to do it my own self’ in the preschool years to the adolescent’s desire to escape parental control of where they go, who they interact with, and what they eat, drink, and smoke. The crunch points occur when parents’ attempts to direct children’s behaviour come into conflict with the children’s desires to develop their autonomy.

Parental control tactics come in many forms and are embedded in other qualities of the relationship, and parents use them with different degrees of consistency. Sometimes one discusses, reasons, negotiates, bargains, persuades; sometimes it is a matter of insistence or power assertion, or even force or punishment. Sometimes you are pleased that your little darling is thinking for herself, even if the result is a refusal to do what you want; sometimes you’re not. I remember a moment of crisis and my partner saying to me, ‘But you wouldn’t have wanted a little pudding, would you’. At the time, blind unquestioning obedience would have suited me just fine. Longer term, he and I have both rejoiced that we have produced an autonomous, not to say feisty, daughter.

We all know from our own lives that no single technique always works or always fails. But the research literature from psychoneuroendocrinology, epidemiology, and psychology does suggest that control which stems from a generally warm relationship, clarifies limits, and explains itself tends to have positive effects, while control which is rigid and insensitive, or which implies negative judgments of the child’s rights, may be harmful. The warmth, the explanation, and the openness to negotiation of the participants may be what are positive about resolving the situation so conflict ends. It could also be that discussion and mutual respect are good beyond the control event because they allow us to practice a host of socially useful skills and demonstrate mutual positive respect. Both inside and outside the moments when parent and child are engaged in control issues, most individuals prefer some autonomy or at least the alternative of being a valued, if low-power, member of the community. We’ve already seen that this is good for cortisol levels.

However, there is one distinction between types of control that psychological theory makes. This distinction is between behavioural control and psychological or emotional control. Behavioural control focuses directly on behaviour; there are rules for behaviour, and behaviour is monitored to ensure that the rules are kept, but if
they are not, the matter can generally be dealt with as the breaking of a rule by an otherwise worthwhile, well-meaning person. The child who persistently fails to wear her hair tied back in school, for example, and gets nagged by her teachers and her mother, may be simultaneously very irritated by their insistence on a rule she sees as petty, and confident that their displeasure [or at least the mother’s displeasure] is limited to this particular issue. Psychological control, in contrast, operates by working on the child’s emotional state – inducing guilt, highlighting parents’ emotional reactions, generalising to the worth of the child elsewhere in his or her life. The behaviourally controlling parent would say, ‘You should tie your hair back, that’s the rule and you just make your life more difficult if you rebel over it’; the psychologically controlling parent would say, ‘You are shaming me’, ‘I can’t love you if you don’t do what I want’, and so forth.

Some parents who use high rates of psychological control may act manipulatively and intrusively and undermine the children’s sense of themselves as worthwhile, leading to children who are at risk of internalising problems such as low self-esteem, guilt, and anxiety. Whatever the sort of control, if it is felt to result from love and concern, it will not carry so much threat to the child’s psychological well-being, and it may be accepted even if it sets a limit to autonomy. Sometimes explaining can help.

But it’s not a simple picture on either side; in my example of the girl with the too freely flowing hair, there were some teachers who felt she was flaunting it at them – that the real issue was a much more pervasive one of a general disrespect for their authority. They may, looking back, have been absolutely right – I think there was some expertise here in behaviour which is subversive but hard to pin down and punish!

Parental control is of course moderated by other factors. Some children are more controllable than others. Having a highly active or an irritable temperament or a predisposition to negative emotions may mean that parenting which is harsh or intrusive is more than usually likely to lead to behaviour problems. This sort of the child needs patient calming control. Fearful children respond better to gentle, warm control. Almost all the time, it’s likely to work out best if you can act before the situation gets really difficult, and preempt the conflict.

All this implies that control needs to be adjusted to the child. Parents find it easier to respond to a young child with simple direct control – saying ‘no’, moving the child away, using distraction – than to do so at later ages, when the child’s persistence will have increased and prohibitions are more likely to be taken personally. Conversely, appeals to reason and the child’s conscience would work better with an older child.
The danger is that a history of conflict, hostility, and mutual negative expectations can build up, so that each little disagreement that occurs is reacted to in terms of the accumulated disagreement of several years of interaction. There is very interesting evidence of this in families with a history of aggression and hostility; family members were prone to react to neutral or even well-intended behaviour as if it was hostile, and fights would ensue over the slightest thing. Adolescents with a chronic feeling of being disrespected seem to experience the world in the same, dangerous, way. The neuroscience on brain development in adolescence suggested that they might be a bit more confrontational than they were when younger or will be when older. The comparison with other species suggests that adolescence is a phase of establishing autonomy and will often include a bit of riotous behaviour and risk-taking.

There are associations between control, monitoring, and children’s behaviour, but they are complex. A substantial body of research suggests that poor parental monitoring may be associated with worse child behaviour. Children are more likely to behave badly when away from parents’ supervision or when parents do not know where they are, who they are with, and what they are doing. It has been argued from this that failures in parental monitoring gave their adolescents the space to behave badly, to hang out with deviant peers who will draw them into delinquency and other problem behaviours. But obviously there is room for a bidirectional effect here: children who wish to behave badly will undoubtedly seek to evade parental supervision while they do so. The girl who broke the rule about loose hair at school left home each morning with it tied back, or at least promising to tie it back en route. The child who wishes to steal, set a fire, or torture a cat will probably not do it where an adult can see. There is also room for earlier history to have an effect on monitoring; parents may not monitor a child who has always behaved impeccably, or they might try to monitor a troublesome child or a troublesome area of behaviour very much more closely; or, faced with a child who persists in behaving undesirably despite their monitoring, they may seek to preserve their relationship with the child rather than risk the child perceiving them as a gaoler: ‘you never let me do anything’.

One issue to consider is how the parent might induce the child or adolescent not to want to engage in deviant behaviour. Earlier parental behaviour or cultural beliefs and practices might have induced a strong attachment between the child and the parent, so that the child wishes to avoid behaviour which will hurt or embarrass the parent or ‘let down’ the family honour (hence, it has been suggested, the relatively low rate of delinquency in East Asian adolescents). Consistent parental explanation of why certain behaviours are undesirable may help if the family has discussed them
and agreed on them. If the child has also internalised the controls that parents or culture offer, they may regulate and supervise themselves. This self-surveillance will be harder for the child to evade than parental surveillance; parents actually spend rather little time where their teenagers are, may have little information about what the teenagers are doing, and may receive only minimal and ungracious answers if they ask for too much information. I think it is very likely that the majority of teenagers prefer it that way. It is also the case that teenagers are likely to have other teenagers as a very important reference group. They may shift from wanting not to let down the family to wanting not let down the gang. Concerns with being disrespected loom large in how they see the world.

The psychology of control suggests that there are levels of self-control as well as reaction to control by others. One of the ways self-control has been examined is by putting children in a situation where they are tempted to break a rule or go against a prohibition or just wait to get a reward – famously, a test involving resisting taking one marshmallow in order to get two ‘in a few minutes’. There is a lot of evidence that how good the child is at deferred gratification is a strong predictor of later success, and probably mental health. Probably different abilities are involved in this: being able to focus attention and manage mood; willingness to commit to practice and not want instant results; better planning; confidence that reward will come, even if that takes a while.

Related ideas about focussing attention, planning, practice, and confidence apply also when we are thinking about control exerted on thinking tasks. There is a useful psychological model of ‘working memory’ which is seen as a sort of ‘desktop’ related both to the input of our senses and the long-term memory stores holding our accumulated knowledge. This desktop is quite small, and the length of time we can hold information in it is limited, too – think of trying to remember a telephone number or a computer password long enough to use it – so we need to get on with things and coordinate the components of our solution to a task. Even babies learn and remember, as we have seen with their very early recognition of mother’s voice or face; it seems possible that differences in babies’ speed of learning predict their intelligence levels in the school years. As children get older, they normally become better at resisting distraction and organising information, and they simply know more; but most importantly, they become better at using strategies to remember what they need to remember and at knowing what their own strengths and weaknesses are. Going to school often has quite a lot to do with this, but home activities like Kim’s Game or using shopping lists contribute, too.
Memory is also a major component of one’s identity, and what we see children remembering or not illustrates how complex this autobiographical memory is. Our recollections of particular events early in our lives are usually fragmented and rarely include much before age five. Freud saw this as blocking about traumatic emotional events, but there are other (better) explanations in the psychology of cognitive development. One reason has to do with not having the ‘labels’ on our memory that help us retrieve it. For example: my three-year-old asking me for the videotape she wanted to watch in which ‘he’s in the snow, there’s a monster, there’s a robber lady’ didn’t work because my label was different – ‘the tape with classic Chaplin films’ – which is much more like the sort of label she would use now. The other reason why specific autobiographical memories are difficult is that we quickly and automatically generalise about events, building up a general script of what happens when we go to school, see a film, choose a book – and the generalised event representation obscures the individual details which are particular to an event.

One’s own autobiographical memory builds up over time, often with contributions from others; it’s part of developing a sense of oneself as an individual person. We don’t know a lot about how a sense of oneself might have evolved. It’s not been possible to identify anything much like this in other species; I used to think that my cat looked as though she was experiencing the self-conscious emotion of shame when I told her off for scratching the sofa, but the harder-nosed scientist who was my partner regularly told me I was anthropomorphising her. There are some fairly convincing demonstrations of primates recognising that the reflection in a mirror is their own. We do know that some primates have mirror neurons that react like our own, so that’s one step towards self-consciousness. Damage to the frontal lobes tends to affect self-conscious emotions such as embarrassment. If there is a brain base for self-consciousness in the frontal lobes, adolescents being so extremely prone to being embarrassed might fit with their redevelopment. Basic biological and perceptual processes which operate from quite early in the first year could begin a sense of oneself as an individual who does things. For example, infants’ attention to the visible bits of their bodies, and their special enthusiasm for events which are contingent on their own action, and their increasing interest in and pleasure in mastery show that they quickly learn that they can observe interesting things that are linked to their own actions. They add to this a capacity for imitation, perception of similarities between their own behaviour and other people’s, and involvement in joint activity with their parents in games and routines. From later on, they use their attachment figure as a reference point about what they are doing. This all suggests their sense of existence in relation to the world and of agency within it could have roots very early in the first year.
We have goals of mastery, autonomy, and connectedness which lead to increasing subjective self-awareness on several fronts: awareness of oneself as able to do things, motivation to master things, and a sense of self-efficacy; ability to self-regulate, thus avoiding emotional distress; awareness of oneself as a social person, engaging in interaction with other social persons, and developing scripts of how such interactions should proceed; and awareness of oneself as someone who is judged by others. You can see that there are things here that will be a very good foundation for happiness if they go right, but a source of great risk if they go wrong.

Differences in infants’ and children’s experiences of emotion and the modulation of their emotions by parents and caregivers, in their experiences of social interaction games and routines with others involving reciprocal exchange and caregiver scaffolding, in the regularity of links between emotion and behaviour, in the early biographical narratives that parents offer to their children, in the development of autobiographical memory capacities, and in the stories children begin to tell would all feed into differences in their sense of who and what they are. In particular, individuals will develop a sense of self-efficacy of how capable they are of getting things as they want them. This is a massive component of educational success, so I am going to dwell on it.

As we develop, increasingly we accumulate labels applicable to us. We come to be able to experience ourselves as objects that can be described and classified as well as subjectively lived. Most theorists see this as being substantially a matter of labels offered to us or imposed on us by others, hence the phrase the ‘looking glass self’. We are constantly provided with labels – ‘who’s a pretty baby then’, ‘clever girl’, ‘bad boy’, ‘people like us just don’t do such things’, ‘you’ve not just let the team down, you’ve let yourself down’. We seem to have a strong propensity to take on such labels, just as we seem to have a propensity to attend to and to imitate others. We live up (or down) to our labels. Sometimes we resist them. Adolescence provides a lot of crises in this.

What’s important here is a long-lasting history of interaction between emotional tendencies and interpersonal relationships. Initially, this will be relationships with parents and with other significant figures. They tell us things about ourselves, and we build up our self-concepts from them. While we’re very little, the labels we use are typically about physical and social characteristics. Often this involves putting ourselves in the same category as a person who is important to us; apparently at about age three I said, ‘Mummy and Joe [my oldest brother] have curly hair; Daddy
and I have nice soft straight hair’, something which my adult self recognises as typical over a long time, both about the hair and about who I identified with most in my family.

Describing oneself in these terms tends to begin at the time when the child is also beginning to have autobiographical memory. Narratives of one’s own life are often constructed in partnership with a parent. Everyday conversations about everyday events (and exceptional events, too) build into a story of who we are and what we’re like.

Young school children tend to be positive in their self-descriptions, often unrealistically positive; possibly they have a sense of how rapidly they are learning new things and having new experiences, which gives them a sense of exciting possibilities being open for them. Being ahead of other classmates can be important; great prestige and self-satisfaction are sometimes attached to being the oldest in the class, for example (which may be one part of the reasons why summer-born children, the youngest in the class, tend to do a bit less well in terms of educational achievement). I know of a child who was happy at being one of the oldest and tallest in his primary school class, but became quite dismayed when classmates started to shed their baby teeth earlier, because they claimed this as a sign that they were more grown up than he was. A bit of discussion with parents of how long-lasting his own teeth were, and how his classmates were merely wearing out faster, restored his sense of superiority, but self-concept and prestige were vulnerable for a while.

As children move into school and spend more of their time with other children and with adults outside the family, their descriptions of themselves include more comparisons with others and incorporate more of others’ views of themselves. Because schools are full of experiences of being assessed and evaluated, children show more sense of differentiating between the self they are and their ideal self. A substantial discrepancy may lead to dejection or anxiety. Small discrepancies that one thinks one can act on can be motivating, so a sense of what is a real possibility and what is unreasonably ambitious can be helpful. Some researchers think it is especially healthy to have a balance of a positive ‘expected’ self – what one can get to be – and a negative ‘feared’ self – I’m not like that and I know how to avoid being like that. A mild overestimation of one’s abilities is probably healthy and protective – depressed people tend to rate their abilities more realistically as well as more negatively.

Part of this can be linked to what individuals think about intelligence; some see it as an attribute that you have a certain fixed and uncontrollable amount of, genetically determined, perhaps; others see it as something you could increase through

PSYCHOLOGY
IN WHICH WE LOOK ESPECIALLY AT PARENTING BEHAVIOUR
Sara Meadows

Excerpted from The Science Inside the Child
practice. People in the first group, with an ‘entity’ theory, tend to focus on performance as evidence for their amount of intelligence and are oriented towards approval and avoiding negative feedback; their confidence is eroded if they fail, they then display learned helplessness, and they avoid challenges because of the risk that they might fail to meet them and so have their confidence reduced. The other group, ‘incremental’ theorists, who see intelligence as improvable, are more oriented towards learning rather than performance, are optimistic about doing better next time and resilient in the face of failure, and take on challenges with an expectation that they will have the skills to master them or at worst should learn from the experience. There’s some evidence that entity theorists had too much feedback as children which praised their particular achievements in too general terms and located the causes of it in the individual rather than the individual’s actions – ‘Clever girl’ rather than ‘you did a really good job of remembering that’. Incremental theorists had more of this ‘you did really well on that because you did such and such a thing’ and consequently focussed more on what they had to do to complete tasks and less on the implications of success for a fixed and generalised view of their ability.

Although there is not an enormous amount of scientific data on the issue, specific task-oriented feedback does seem to be more effective in motivating learners. I think it’s worth trying to provide it to your children or pupils.

Whatever ‘ability’ is, the way you use it may have just as much to do with the results. The extremes of high performance probably do include ‘ability’, but they also invariably involve a lot of practice, as we can see from outstanding athletes, musicians, artists. We learn most of what we can do from repetition and practice. We learn to do things well, and it may be especially helpful to learn to do things well in several different ways because these different ways are then available to fit in with variations in the task.

What does mastery mean for the well-being of the child? First, mastery is satisfying or even fun, as the grin of the baby shows, and it makes sense to see it as a natural part of our developmental machinery. Engaging in activities that involve mastery often leads to positive emotional states and feelings of satisfaction and relaxation. Second, mastery can itself be self-developing – we out-do our previous record, or increase our proficiency a bit, or become slicker and shinier and with more ‘wow factor’, or just reach the same result in a different way. (Though sometimes ‘good enough’ is good enough.) Third, we practice skills like planning and monitoring our own progress while we develop our mastery, and fourth, our own mastery and our own evaluation of it are situated in the middle of other people’s evaluations of us and other people’s degree of mastery. We compare ourselves with others. These comparisons offer us opportunities...
to learn from others’ experiences, but they also have repercussions for our reputation and our motivation and our emotions as we experience emotions that are social and self-conscious, such as confidence, pride, shame, guilt, and embarrassment. These emotions all combine appraisal of oneself, of the situation, and of significant others, and the emotional consequences of the comparison – should I be pleased with myself, have I done something which will make other people think the worse of me – and may be powerful both in the particular situation and in general development, especially if we lose control over them.

You can see the beginnings of these emotions in toddlers. In one study, researchers observed the reactions of children aged thirty-three to thirty-seven months to success and failure on easier and harder tasks and found that failure on the easier tasks was particularly likely to produce behaviour such as collapsed body posture, averted gaze, corners of the mouth drooping downwards, hiding one’s face, and expressing a negative evaluation of oneself, and on the physiological level, there were cortisol changes similar to those in adults. If there is a lot of it, an emotion like shame or anxiety may become more internalised and can come to be experienced as a deep sense of defectiveness and inadequacy: ‘low self-esteem’. The way in which the child is socialised may affect how strongly this develops; people with fearful or preoccupied attachment patterns, people who have been abused, and people whose parents used shaming as a discipline technique may be more prone to it.

People who have low self-esteem, that is those who see themselves as being not nearly so good as they would like to be, are at high risk of all sorts of poor functioning, such as emotional and social difficulties, both contemporaneously and later. These may include depression and anxiety, substance abuse, suicidal behaviour, and social and adjustment problems. Biological bases in the regulation of the psycho-neuro-endocrinological systems and in position in the social group are likely to be relevant. Epidemiologically, having low levels of self-esteem in adolescence is associated with greater risk of later mental health problems (including depression, anxiety, conduct/antisocial personality disorder, and thinking about suicide), substance dependence problems (including nicotine and alcohol dependence and dependence on illicit drugs), and life and relationship satisfaction issues (including lower levels of life satisfaction, poorer perceived relationship quality, and lower levels of peer attachment). But it’s unlikely there is a single simple causal sequence; possibly self-esteem plays a causal role in life outcomes, with an individual’s level of self-esteem being critical in determining success and failure across a range of life tasks, or possibly it is a marker for problems elsewhere which
lead to poor life outcomes. The epidemiological associations are moderate rather than strong. And they are very much reduced once confounding factors such as previous mental health problems, lower IQ, higher levels of neuroticism, and experience of a number of childhood adversities (including socioeconomic disadvantage, family dysfunction, child physical and sexual abuse, and impaired parental bonding) are allowed for.

Daily life stresses may have their effect via multiple levels. One such would be effects on the emotion-regulation systems of the central nervous system. As I have already discussed, if there is excessive, adverse input in early life, there may be long-lasting changes in the development of the brain and endocrine system responses to stress. The plasticity of the child’s brain development will allow for the establishment of central stress-responsive pathways which normally help the child to cope with the challenges of the environment by creating a central stress response pattern that can be evoked in subsequent times of stress. However, it is possible that this process may become maladaptive over the lifespan in those people exposed to excessive childhood stress; for example the child exposed to parental depression may on one level develop attachment problems and on another level build up a hypersensitive neural response to stressful stimuli.

One core factor in psychological development is self-regulation. Self-regulation of emotion, cognition, and action may be a key part of developing a set of responses to stress which prevent it from being an overly damaging experience. People whose behaviour is very low on self-regulation are less likely to show resilience in the face of adversity. Appraisal of a task is enormously helpful in carrying it out successfully. ‘Planfulness’ is a big component of educational success. Appraisal of a stressful situation, judgement of its emotional meaning, and regulation of emotions and arousal so that they do not impede problem-solving behaviour will all be useful components of positive coping responses and contribute to success and to resilience in the face of difficulties. Being better at self-regulation, at focussing on the task in hand, and at shifting tactics flexibly if necessary are all associated with greater resilience.

Studies of adolescents in countries as different as the US, China, and Colombia have found that those who were showing antisocial behaviour at age eleven showed less self-regulation than those whose antisocial behaviour emerged later, and that those who never showed antisocial behaviour had the highest levels of self-regulation. The effects of antisocial peer groups and adverse personal history were more powerful with the individuals who had poor self-regulation than they were with individuals who
being better at regulating themselves. Individuals with poor self-regulation were more likely to be stressed and depressed. Finally, experience of parenting and opportunities to meet and rise to challenge are associated with later self-regulation and resilience. Other people’s planning matters, too. In a classic study of girls who had been ‘in care’ because of family breakdown, a substantial proportion of girls who had shown little ability to plan how their lives would go had poor outcomes, while girls who had planned were much more likely to turn out well. The peer group was important here, too; some girls who did not plan paired up with young men who were also in care and also lacked the skills and the support networks that might have helped them all to be better parents.

Poor impulse control is one of the risk factors for delinquency. Poorly functioning individuals suffering from psychological and social damage may show difficulties with regulating their emotions and their displays of emotion, with inhibiting risky or inappropriate behaviour, with orienting themselves towards the future rather than the immediate present, with thinking about consequences, and with the planning, initiation, and regulation of goal-directed behaviour. These consciously controlled behaviours or ‘executive functions’ are seen as being dependent on the functioning of the prefrontal cortex and connected regions, at least in adults; these are regions which are still maturing at adolescence, and which may be associated with the emotional volatility and waywardness that adolescents often show.

The obvious causal pathway from self-regulation and executive control to resilience is differences in coping strategies; children who are persistent and task-focussed, able to control impulse and delay gratification of their desires, and able to cope with the emotional arousal caused by struggling are more likely to work through to a satisfactory solution and to see themselves as able to succeed than children who have difficulty in focussing and persisting and give up easily. Children who are highly impulsive and do not reflect on their experience may suffer more adverse events such as physical injuries and may also be more at risk of substance abuse. Parents’ feedback (and teachers’ feedback) can help convince people that they can persist and improve, rather than that effort is futile. Obviously, it is possible to teach people to plan more and act on impulse less. Parents do this all the time with their children, and teachers do it with their pupils.

Although resilient people have often engaged in planful activity, and people who plan appear to be more resilient, there are issues about causation and about how much ‘planfulness’ is a good thing. The disadvantages of never being planful or controlled
are fairly obvious, as I have just argued, but it may be possible to be too planful if it edges into rumination and excessive blaming of oneself. I spent much of my young adulthood thinking everything was my own fault; realising that most of it wasn’t and that ‘good enough’ is good enough were among the many benefits of growing older.

Children whose approaches to life show positive emotions in response to minor life events show more resilience than those whose overall emotional tone is negative. Children whose characteristic temperaments show a positive sociable approach to new situations show lower levels of behaviour problems and higher levels of social competence and emotional adjustment than children whose temperament is low on approach and sociability. In a whole host of studies, children with a more open and optimistic outlook were more likely to show resilience than more pessimistic children. (We probably all know individuals who seem to expect the worst and then get it as expected, with every reaction being one of deep-dyed pessimism – Eeyore in the Winnie-the-Pooh books is a classic example. In some cultures, of course, expecting the worst and then having a good moan about it might be an acceptable coping strategy. There may be some cultural limitations to the evidence that justifies the assertion I have just made about chronic optimism being better for you than chronic pessimism.)

How does the association between a positive outlook and resilience come about? In a multiplicity of ways, but amongst these there are several that are of interest. It may be that children who are high on negative emotion or difficult temperament tend to get decreasing involvement with their parents compared with children whose behaviour is more smiley and sociable, which might mean that they get less parental support when a challenge comes along. Parents of children who are shy and inhibited may be protective rather than trying to promote their child’s independence, which might increase the child’s initial tendencies to be cautious and inhibited and decrease the likelihood that the child will become involved with and learn from more boisterous peers, and so be steeled against minor social stresses. Children high in negative emotionality may react more strongly to stress and negative events than more emotionally positive children. They may be more likely to employ passive avoidant coping strategies which reduce their opportunities to develop positive solutions to the problems they meet and less likely to use flexible, active coping strategies, all of which could make them a little more likely to face the next challenge with an anticipation of difficulty and defeat.

Similarly, children who are more socially oriented elicit more positive responses and support from their parents, peers, and other adults than unsociable individuals,
which gives them more positive social experiences and more access to help and encouragement when things turn difficult. Children with better self-regulation and more supportive parenting had better cognitive, behavioural, and social outcomes following parental divorce, for example.

Psychology, like epidemiology, reminds us that resilience is going to be affected by multiple factors combining for better or for worse, and that some risks are just so big that everyone who encounters them is damaged. We are, historically, lucky if we personally don’t encounter them. And we are morally obliged to try to minimise their effects for others.
CHAPTER 7

ATTENTION, EXECUTIVE FUNCTIONING, AND MOTIVATION PROBLEMS IN TEENS

This chapter is excerpted from
Parent-Teen Therapy for Executive Function Deficits and ADHD
By Margaret H. Sibley
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The phone alarm goes off at 6:00 A.M., then again at 6:15, and at 6:30, without Marcus stirring. It is not until 6:45, when his mother pounds on his bedroom door, that he begins to gain consciousness. His mother yells, “The bus comes in five minutes.” She has a critical meeting at work she cannot afford to miss. “You have to catch the bus,” she tells him frantically, “I can’t be late to work again because I had to drop you off at school.”

Marcus stumbles out of bed and stares at the mess around his room. His shoes, textbooks, soccer equipment, and laptop cover the floor. His phone alarm chimes repetitively as he sifts about his belongings, trying to put a stop to the noise. He thought he had just had the phone in his hand a minute ago. Mom pounds the door again and rattles the locked doorknob. Increasingly upset, her tone escalates: “Marcus, I can’t do this again. Unlock this door right now.”

He bursts out 4 minutes later, with no time for breakfast, brushing his teeth, gathering his textbooks, or having a moment to think about what happened to the end-of-term math assignment he needs that day for class. Marcus catches the bus today, his final Monday of eighth grade, but barely. And his important assignment lies underneath his bed, kicked aside when he was playing video games the night before.

The bell for first period rings. Marcus gazes longingly over his shoulder at the popular group of students in his class, chatting, laughing, likely with their assignments safely stowed in their backpacks. He slowly makes his way to his seat in the middle of the classroom. His teacher instructs the class to turn in the math assignment. Marcus unzips his backpack and digs through the mishmash of papers hunting for his assignment. He’s sure he finished it last night. Where was it? He quickly texts his mother: “What did you do with my math assignment?!” Exasperated, he notices his teacher standing next to his desk. The rule of no texting in class means his phone is about to be confiscated.

“I wasn’t really texting! I was just trying to figure out why my mom took my math assignment out of my bag.” His protest falls on deaf ears. The phone is confiscated, and his fellow classmates snicker something about his mommy from the back of the room. He blushes. The teacher begins to review material for the final exam. Marcus may have heard her voice, but he focuses his attention on the activity outside the classroom window, watching high-schoolers dribble a soccer ball down the field. When the teacher announces the homework assignment, Marcus’s mind is far away, counting the number of days until the start of the World Cup.
Back home after school, Marcus calls his mother from their home phone to explain his cell phone confiscation. He demands that she stop at school on her way home from work to pick up the phone and complain to the principal, expressing his conviction that the teacher was picking on him. He believes that the teacher always unfairly assumes he was doing something wrong. When Marcus hangs up the phone, he opens the cupboard, finds an unopened bag of chips, and turns on the television. *Wait, was there math homework?* he wonders. He doesn’t remember any. Probably just to study for the test, but he knows it isn’t until Thursday, so he has time to study tomorrow. Plus, he wants to catch up on episodes of one of his favorite shows before his mother returns from work and starts nagging him to do homework. She’d better get his phone back tonight, he thinks, fiddling with the casing of the TV remote.

Two hours later, Marcus’s mother opens the front door and drops a thick file folder on the kitchen table. She pours a glass of red wine and walks into the living room. She fixes her gaze on Marcus, who is sprawled on the couch with his eyes glued to the television. He turns to her. “Did you get my phone back?” Angrily, she replies, “I went all the way to school to catch someone before it closed. I found your counselor in the office and asked her about your phone. She didn’t know anything about it. But she knew all about the 10 detentions you received this month and how you didn’t show up to serve any of them. What is going on?”

Marcus ignores her demands for an explanation and focuses only on his phone. “You didn’t get my phone!?” His mind returns to and then fixates on his teacher’s unfairness. “She had no right to take away my phone. It’s stealing. I’m going to complain about her to the school board. This is injustice.” As Marcus’s mother steers the conversation back to his detentions, he refuses to let up on his complaints about the teacher. “She gave me those detentions for no reason. She is targeting me.” The discussion continues in this manner for 10 minutes, with Marcus blaming his teacher and his mother demanding answers about the detentions. Finally, she retreats to her bedroom and closes the door firmly behind her. Marcus turns back to the television and reaches back into his bag of chips, lifting a handful to his mouth as he settles back into his show. At 1:00 in the morning he sleepily drags himself to bed, setting his alarm to go off 5 hours later.

The evening caps what appears to be a very unlucky and stressful day for a teenager—yet for Marcus, this Monday represents a relatively typical day in his life.
WHAT’S REALLY GOING ON WITH MARCUS?

Most therapists who treat teenagers have met Marcus. He may be a typically developing teen who stumbles with the increasing demands of adolescence. He may have a clinical diagnosis of attention deficit/hyperactivity disorder (ADHD), an autism spectrum disorder (ASD), or another diagnosable neurocognitive deficit. What is clear is that Marcus struggles in a way that significantly affects his daily life. Marcus could benefit from intervention—but which approach would be best for him?

There are several treatment modalities that target the types of problems Marcus experiences. However, each approach tends to target just a single aspect of his impairments. Marcus and his mother easily spiral into stressful arguments when he fails to meet his mother’s expectations. Traditional family therapy approaches may create positive communication and strengthen the parent–teen relationship, but they don’t treat other issues that underlie the problem, such as his lack of organization, time management, and planning skills that create major problems with completion of homework and his daily routine and thereby contribute to tension with his mother. Organization skills training approaches teach teens strategies to better manage their schoolwork and daily activities; however, to promote independent skill use, the parent typically must provide structure at home that motivates the teen to practice skills daily. Marcus’s mother relies on an exhausting combination of reminding, lecturing, and yelling to extract effort from Marcus, which may help him do his work but can damage their relationship, increase parental mental health problems, and stifle Marcus’s independence. Behavioral parent training can offer Marcus’s mother skills in using contingencies to motivate him to complete daily tasks independently; however, failing to involve Marcus in this process can stifle teen autonomy and undermine his engagement in behavioral interventions. Finally, Marcus holds several maladaptive beliefs that negatively influence his behavior—namely, that completing schoolwork is boring and that his teacher is out to get him. Cognitive-behavioral therapy may help Marcus challenge these thoughts to decrease procrastination and improve his emotional reaction to stressful situations, but again it won’t address the entire picture.

In sum, each of these treatments may enhance functioning in one domain; yet the difficulties Marcus experiences are not discrete. Problems with homework and school behavior lead him to argue with his mother. Maladaptive cognitions trigger problems with his teacher and arguments with his mother. Poor planning affects his school grades. His mother’s lack of structure at home exacerbates Marcus’s disorganization and motivation problems. Her tendency to argue back to Marcus
further seeds tension in their relationship. When Marcus’s mother gives in to his demands, he learns that becoming angry will lead his mother to retreat. With decreased supervision, Marcus’s organization and motivation further deteriorate. With teens like Marcus, a one-dimensional approach to treatment can be grossly insufficient.

Some refer to Marcus with terms such as lazy, inconsiderate, irresponsible, scatterbrained, or stupid. His neuropsychological profile tells a different story. Work by researchers show us that teens like Marcus, who struggle to organize, plan, and self-regulate, often experience developmental deficits in one or more distinct but intertwined neurocognitive processes: attention, executive functioning (EF), and motivation (Barkley, 2014; Castellanos, Sonuga-Barke, Milham, & Tannock, 2006; Sonuga-Barke, 2002). These functions combine to produce goal-directed behavior and involve several regions of the brain, including the prefrontal cortex, striatum, anterior cingulate cortex, and thalamus.

In any given environment, attentional processes determine the brain’s selection of particular information for processing. In selection, the brain acknowledges certain pieces of information but passes over others. When Marcus attends to the soccer players outside of his classroom window, his brain ignores the classroom lecture. This selective attention obviously leads to problems for teens such as Marcus when they fail to retain information presented in class or listen to adults who are speaking with them.

EF represents cognitive processes that control effort and behavior. EF is associated with the ability to organize and carry out goal-directed behavior, which includes organizing, planning, holding information in mind, and inhibiting actions that fail to support one’s goal. EF also includes functions that provide top-down regulation of the attentional processes just described. Marcus shows impaired EF in a number of areas, including his difficulties keeping track of schoolwork, his tendency to lose materials, his difficulty remembering details, his inability to inhibit emotional verbalizations to adults, and his trouble in carrying out multistep tasks. Magnetic resonance imaging (MRI) scans of Marcus’s brain might show less development than those of his classmates in certain areas—most likely in his prefrontal cortex (Shaw et al., 2006), which is the operation center for these functions.

Marcus also shows dysfunction in motivation processes. He experiences delay aversion, which is an atypical level of mental discomfort experienced during unstimulating activities. To escape this discomfort, he gravitates toward immediately gratifying
activities, be they emotionally or visually stimulating (e.g., watching soccer out the window, television viewing, video games). His brain cues automatically to distractions that relieve the discomfort of sustaining the mental effort required to focus on uninteresting or difficult tasks. Unfortunately, this inclination to attend only to immediately stimulating activities often prevents him from completing multicomponent tasks and projects that feel hard or boring in the short term. As a result, Marcus chooses to watch television or play video games instead of completing academic tasks that he dreads but that yield important long-term payoffs (e.g., studying for a test, taking the time to clean up his bedroom). During the teen years, many of Marcus’s peers will learn to work steadily on multistep assignments, recognizing the long-term gratification of a high grade, college acceptance, or fostering trusting relationships with adults. Instead of being viewed as someone who will “get the job done,” Marcus may come to be viewed as inconsistent and unreliable. For Marcus, overcoming motivation problems will be a slow and challenging process.

If brain functioning is disrupted in any of the processes described above, the teen is likely to experience difficulties in self-regulation and enacting goal-directed behavior. For example, a student may receive a poor grade on a homework assignment because he or she cannot force him-or herself to get started or to keep working (motivation problems), has trouble attending to information or instructions needed to complete the assignment correctly (attention problems), or loses the assignment before turning it in (EF problems). Many teens who have problems with one of these functions also have problems with the others. Without recognition and treatment, these deficits may leave a lasting mark that limits their future opportunities.

**NAVIGATING ADOLESCENCE**

The adolescent period is meant to be fun, socially enjoyable, and personally formative (Steinberg, 2010). Adolescence is a time for personal exploration, skill development, building autonomy, and formulating one’s own goals. For the first time, teens are given opportunities to organize their daily schedules, tailor their education, and engage in unsupervised peer activities. Teens start to develop their own taste in music and media and passions for sports teams and social causes. And for the first time, they begin to develop more adult-like social relationships. Decisions made and interests forged during the teen years pave the course of adulthood.

All teens possess unique strengths that can be cultivated during the period of adolescence to prepare them for adulthood and for an emotionally healthy and
satisfying life. Although we’ve focused on Marcus’s deficits, he also has strengths. He has been a gifted soccer player since elementary school. His interest in video games has allowed him to connect with a range of peers through live multiplayer gaming. As clinicians, we want to recognize his strengths and work with him with the hope that he will reach the milestones of adolescence and create a personally gratifying adult existence. We want Marcus to explore identity within the safety of his teen environment, to independently develop adaptive skills to allow him to leave home in an age-appropriate time frame, and to identify personal goals that guide him toward a positive future. Additionally, we want to make sure that Marcus’s deficits do not lead to serious events that may derail his course toward happy and healthy adult living.

Unfortunately, positive adolescent development often eludes individuals like Marcus who display neurocognitive deficits in attention, EF, or motivation. Instead, adolescence may become a challenging period with lasting negative consequences. Social and academic demands increase exponentially in the teen years, and adolescents like Marcus may be unprepared to meet these challenges. We expect teens to independently manage their academic lives, responsibly moderate their use of social media, engage in a range of extracurricular activities, and increasingly contribute to their households and communities. With deficits that interfere with the ability to plan, organize, and self-regulate, teens like Marcus may find the transition to adolescence to be overwhelming.

The secondary school environment is much more complex than elementary school. Teens must independently transition between classes with separate teachers, keep track of assigned work and deadlines, and complete multistep tasks and projects with minimal adult support. Even typically developing teens will at first struggle with academics when adapting to new secondary school environments (Eccles, 2004). However, gradually the foundational skills built in elementary school will successfully carry new middle school students through this rocky transition. Unfortunately, teens with neurocognitive deficits not only naturally struggle with independent self-management but also may have lost years of childhood skill development in less demanding elementary school environments (e.g., lower class placements, failure to participate in after-school activities). With missed opportunities to engage and develop their already lagging EF skills (i.e., organization, time management, planning), these teens may be substantially unprepared for the adolescent transition. Just when teenagers need all of their EF faculties working together, those with neurocognitive challenges have little ability to deal with the increasing complexity of their academic and social lives.

Struggles to independently manage the new demands of adolescence may leave some teens vulnerable to even more serious problems. We know from the work of
B. J. Casey and colleagues (Casey, Jones, & Hare, 2008) that the typical adolescent brain experiences uneven development in the systems involved with behavioral decision making. Regions that create pleasure during enjoyable activities (largely through release of the neurotransmitter dopamine) develop earlier than the EF regions that help us to say “no” to behaviors that may at first be pleasurable but that ultimately lead to negative consequences (such as eating too many potato chips or playing video games instead of doing homework). For adolescents, this exaggerated and uninhibited dopamine release excites the teen in the presence of socially or emotionally salient stimuli (e.g., peer attention, social media, romantic encounters, fast driving, substance use). Unfortunately, immature EF regions are unprepared to sufficiently rein in these powerful reward responses. As a result, most teens, whether or not they have EF deficits, are prone to engage in exciting, fun activities that unfortunately can sometimes lead to negative results.

The typical afflictions of adolescence hit hardest when a teen experiences attention problems, EF deficits, motivation problems, or, worse, all three. Adolescent impulses can be difficult for a typical youth to manage, but teens with motivation problems will find these urges even more irresistible. These youth have two biological reasons to engage in risky or irresponsible behavior: (1) an adolescent drive toward emotionally rewarding experience and (2) deficits in motivation that drive them away from monotonous tasks and strengthen a desire to engage in immediately gratifying activities. When EF abilities are underdeveloped compared with those of peers, a teen has the worst of both worlds. With weakened abilities to inhibit impulses, teens with EF deficits can become hamstrung by developmental surges in dopamine. With trouble finding success at home and school and a thirst for immediate gratification, these teens are at highest risk for school disengagement, problems with parents, and participation in problematic activities.

Developmental risk models (Sher, Grekin, & Williams, 2005; Zucker, 2006) warn that major negative life events disrupt adolescent milestones or present serious setbacks in adulthood. These include failure to complete high school or an equivalent vocational certificate, incarceration, addiction, driver’s license revocation, severe mental illness, teen pregnancy, major injury, and dependence on government assistance programs. Pathways to many of these negative events begin with school failure and alienation from family members in early adolescence (see Figure 1.1). Many adolescents who fail to find personally rewarding experiences in positive environments—such as extracurricular activities, recreational interests, academics, or prosocial relationships—often seek stimulation from deviant peers, substances,
rule breaking, and other risky activities. Not only can these alternatives present imminent negative consequences for the teen, but the absence of positive teen experiences also prevents development of adaptive interests, skills, and identity.

All of Marcus’s deficits in attention, EF, and motivation create difficulty with his ability to self-regulate. This problem puts him at risk for school failure (through disorganization, disengagement, and poor work completion) and family conflict (through inconsistent completion of responsibilities, behavior problems, and poor verbal self-control that lead to conflicts with parents). For teens with these neuro-psychological deficits, the unfolding consequences of academic failure and family stress are further compounded by poor behavioral inhibition. As they struggle to suppress particularly strong urges, these teens are prone to try substances, engage in unprotected sex, disregard rules, and engage in risky driving at higher rates than their peers. The capstone of these pathways is often a teen who drops out of high school. This leads to further problems, as teens who fail to earn degrees by young adulthood will struggle to sustain employment and achieve financial independence. In addition, they may experience severe mental illnesses or may turn to a life of persistent substance abuse and criminal behavior. Thus, due to cascading
risks, teens with attention, EF, and motivation deficits are particularly prone to a disrupted adolescence with potentially debilitating consequences by young adulthood (for empirical support for these processes, see Barkley, Murphy, & Fischer, 2008).

FINDING SUCCESS IN ADOLESCENCE

To get teens with attention, EF, or motivation problems back on track developmentally requires scaffolding. To achieve critical milestones—identity building, goal formation, skill development, and self-sufficiency—intermediate steps must be set in place. Attempts to permanently remediate teens’ underlying neurobiology through cognitive training programs or medication have been largely unsuccessful. So far, the outcomes of brain training programs for this age group reveal that teens master computer practice tasks but that these improvements do not translate into real-world gains (Gray et al., 2012; Steiner, Sheldrick, Gotthelf, & Perrin, 2011). Central nervous system stimulant medications that alter neurochemistry (e.g., Ritalin, Adderall, Concerta, Vyvanse) improve neurocognitive functioning only when the pill is active in the teen’s system—improvements reverse once medication wears off (Greenhill et al., 2002). Chronic use of stimulant medications also causes limitations. Over time, physiological tolerance to these drugs’ therapeutic effects may suppress their effectiveness (Swanson et al., 1999). In fact, most teens who are prescribed stimulant medications in childhood ask to stop taking the pills in adolescence due to uncomfortable side effects or to the social and self-concept implications of relying on daily medication (for more information on the long-term effects of stimulant medications, see the adolescent results of the Multimodal Treatment Study of Children with ADHD [MTA study]; Molina et al., 2009). Without a way to permanently alter neuropsychological capacities, teens with attention, EF, or motivation deficits must develop compensatory skills. For these teens, this becomes a central goal of adolescence: development of long-term strategies for overcoming neurocognitive deficits.

A second goal for teens with attention, motivation, or EF problems is to discover environments that maximize their strengths while minimizing the influence of deficits. Thus a strength-based approach is particularly critical for teens who repeatedly experience failures. These efforts include choosing an educational path that engages the teen (minimizing motivation problems) and turns proclivities into unique skills that will serve the teen in the future. The experience of success in one domain can bring success in others; if Marcus excels on his school soccer team, he will be more appreciated by his peers. He also may push through motivation difficulties during homework to maintain an adequate grade point average (GPA) for team membership. Conversely, environments
that are poorly suited to a teen with attention, EF, and motivation problems may increase the daily routine’s averseness. This may include academic environments that demand high levels of self-sufficiency (exacerbating the effects of attention and EF deficits), schools with prevalent bullying, classrooms with teachers who are impatient with student symptoms, or highly rigorous academic programs.

Finally, a critical goal for these teens is avoidance of negative life events that disrupt the path to healthy and independent living. As such, deliberate efforts must occur to measuredly increase independence in such a way that requires teens with attention, EF, and motivation deficits to prove readiness for new freedoms. Educational completion is emphasized here. A number of teens with these difficulties fail to finish high school (Barkley et al., 2008), making this outcome one of the most imminent and concerning for these youth. Failure typically begins with incomplete work and poor test grades. Without proper supports, school problems may escalate to course failure, grade retention, and complete disengagement from school (see Figure 1.2).

**HOW TO HELP**

What tools exist for professionals seeking to help teens with attention, EF, and motivation deficits? How does one facilitate identification and development of compensatory skills, create opportunities for teens to explore values and interests, and enact measures to prevent major negative life events? Many therapists, counselors, and educators find that professional tools that support these goals are limited. Our field’s recognition of the intertwined effects of teen attention, EF, and motivation deficits is fairly recent. Although several one-dimensional approaches to treatment are available to clinicians, integrated approaches for treating these teens are scarce. Several components of treatment must be incorporated to appropriately address the multiple areas of difficulty experienced by these youth.

First, teens need introduction to compensatory skills that help them overcome the effects of their neurocognitive deficits. These efforts involve age-appropriate organization, time management, and planning strategies. Instruction in these strategies has most frequently been delivered by school professionals, in after-school programs, or through multiweek summer programs. When teens practice these techniques, their ability to self-manage improves at home and school (Evans, Schultz, DeMars, & Davis, 2011; Langberg, Epstein, Becker, Girio-Herrera, & Vaughn, 2012).

Compensatory skills in organization, time management, and planning require continuous practice to produce mastery and, finally, habitual independent skill use.
Excerpted from *Parent-Teen Therapy*

CHAPTER 7

by the adolescent. The biggest impediment to practice and habit development is the adolescent’s motivation problems. Enacting compensatory skills takes effort and adds extra steps to the teen’s daily routine. Adolescents with motivation problems are likely to find this extra work aversive. To jump-start skill practice and create lasting habits, treatment of EF deficits must be supplemented with treatment of motivation problems. Methods for addressing teen motivation problems are less developed than is treatment for EF skill deficits. In school-age children, parents and teachers are trained to override motivation deficits by administering salient rewards and consequences to children for meeting (or failing to meet) behavioral targets. The child’s excitement at the thought of receiving these adult-administered rewards reduces the discomfort of boring or difficult tasks. In adolescence, contingency management takes a new form. Parents and teens are encouraged to collaborate in devising a daily structure that requires the teen to complete responsibilities before accessing enjoyable activities (Forgatch & Patterson, 1989). This structure is best reinforced by an adult in the teen’s life who (1) is in daily contact with the teen, (2) can oversee the teen’s access to enjoyable activities, and (3) is willing to allow the teen to contribute to planning and contracting as an equal.

When EF skill instruction and age-appropriate contingency management are delivered in concert, teens develop helpful new habits and begin to connect the dots between practicing organization, time management, and planning skills and achieving success. After a few weeks of consistent skill practice, a teen may begin to see an improvement in school grades. If the pride or newly realized benefits of this success outweigh the mental discomfort of practicing the skill, the teen may continue this habit in the absence of an explicit contingency structure at home. Of course, this epiphany likely is not enough to permanently change teen behavior, but it can be a productive first step for the teen.
ENGAGING PARENTS AS STAKEHOLDERS

There are typically two classes of adult stakeholders engaged in the daily life of teens: parents and secondary school staff. For several reasons, parents may be ideal participants in treatment. First, many parents have more available time and resources than secondary school staff, and they obviously have more emotional investment in the teen. Second, parents are sustainable agents of change; school staff members are only available the year the teen is under their supervision. Third, in middle and high school, a large portion of academic work is completed at home, outside of the purview of school staff. Finally, parents who make lasting changes to their own maladaptive parenting behaviors will create much greater change in their adolescent than could occur by any outside resource or school intervention. If Marcus’s mother can work with a therapist to find more appropriate ways to encourage independence and respond to his emotional outbursts, it will pay dividends for Marcus in the long term. The first component of this therapeutic support is often building parental engagement and parents’ willingness to modify their own behavior in support of teens’ success. Though many parents seek treatment in hopes that a therapist can teach or convince the teen to shape up, the deepest therapeutic work often occurs within the parent. Because maladaptive parental behaviors can take several different forms, sustainable treatment of the parent–teen dyad must accommodate individual differences in the parent’s presentation.

OVERCOMING NEGATIVE PARENTING PATTERNS

It is well known that consistent monitoring of teen behavior, positive parent–teen relationships, and allowing some teen autonomy are key elements of successful authoritative parenting—the parenting style that fosters best outcomes among adolescents (Steinberg, Lamborn, Dornbusch, & Darling, 1992). It is also known that these parenting practices tend to be disrupted in parents of teens with attention, EF, and motivation deficits (Edwards, Barkley, Laneri, Fletcher, & Metevia, 2001). Coercive parent–youth interactions unfold over time, such that child self-regulation problems lead to parental frustration, which can further exacerbate a child’s behavior problems. As a youth’s behavior escalates, parents who eventually give up on enforcing consequences teach their children that the more you protest, the more likely an adult will be to give in. By the arrival of adolescence, these patterns may be deeply ingrained, creating high levels of conflict, parental disengagement, over-control, or criticism.

As illustrated in recent work from our group (Sibley et al., 2016), negative parent–child cycles can also apply to academics. In a sample of nearly 300 teens with attention, EF,
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and motivation problems, parents were asked to complete questionnaires about their typical involvement in adolescent academics—with specific attention to how parents managed attention, EF, and motivation problems in their teens. Statistical analysis of parental response patterns indicated the presence of three broad parent management patterns—two of which exposed habits that actually may worsen teen impairments.

First, there were some parents who seemed to be doing things right. Approximately 20% of parents and teens appeared to be engaging in a collaborative approach to managing teen deficits. These parents cooperatively set a home structure with teens, set limits on their freedom, and required accountability for completing schoolwork. Importantly, parents displaying this pattern appeared to have the highest levels of personal well-being. They experienced less emotional distress and fewer physical ailments, presumably due to the stable and calm home environment that stems from a collaborative approach.

A parental control group, formed by about 40% of the sample, represented a first maladaptive pattern. Many of these parents were highly involved in all aspects of teen organization, time management, and planning (though some limited their overinvolvement to homework help). These activities included frequent assisting with and checking of teens’ academic work, high levels of contact with teachers, checking the teens’ online grade book daily, and reorganizing school materials without their teens’ involvement. When parents believe the adolescent is incapable of completing work independently, the parental control strategy offers an effective short-term solution to failing grades (i.e., parents manage academics for the adolescent and grades improve); however, long-term consequences of this approach undermine adolescent independence. Adolescents may learn that dawdling during academic work will encourage parents to offer a high level of assistance—ultimately reducing the amount of time and effort the teen needs to spend on homework. Teens also fail to develop and practice critical compensatory skills when parents manage academics for them. During treatment, we affectionately call these parents the teens’ “personal assistants.” This pattern can be debilitating to the teen and also highly taxing to the parent. Parents were most likely to enact this strategy when the teen was younger or showed high levels of EF dysfunction. These parents also reported the highest levels of anxiety and health problems in themselves.

A final parental pattern, termed uninvolved, comprised another 40% of parents in the sample; they represented broad disengagement from their teens’ academic work. The older the adolescent, and the stronger the adolescent’s motivation problems, the more likely the parent was to display the uninvolved pattern. Many parents who displayed the uninvolved pattern reported previously engaging in the parental control pattern. Perhaps
years of adolescent EF and motivation problems that were unaltered by parental micromanagement created hopelessness in some parents. If prior attempts to encourage the teen were unsuccessful, these parents may see no value in continued efforts. Parents displaying the uninvolved pattern also reported higher levels of depression.

These study results suggest that a majority of parents of teens with attention, EF, or motivation problems adopt dysfunctional parenting patterns in natural response to adolescent deficits. Unlike the parents of younger children, parents of adolescents have over a decade of experience interacting with their children and forming stable beliefs about the adolescents’ abilities. These beliefs are powerful determinants of the parents’ behavior and guide their parenting choices. Often, what professionals see as a parenting problem has been the parents’ only solution for years.

Conflicts are particularly prone to arise when control-oriented parents attempt to withdraw support or uninvolved parents begin to increase oversight. In these cases, teens had not been held accountable for any independent work, and when new limits were suddenly placed on them, conflict ensued. In addition, these teens had not been taught the skills or learned the motivation required to transition to independent academics. As a result, families who desire to change rules and expectations at home may require therapist guidance and support to do so successfully.

**LONG-TERM SUCCESS**

We’ve seen that treating attention, EF, and motivation problems in teens requires compensatory skill instruction and practice, implementing a contingent daily structure that is supervised by a supportive adult, and remediation of maladaptive parenting problems. Earlier we noted that motivation problems may return when reinforcements for skill practice are removed. So, how does one help teens develop skills to overcome motivation deficits in the long run?

Let us reconsider the nature of teen motivation problems. Teens with motivation deficits, such as delay aversion, experience an unusual level of discomfort with monotony or effortful tasks when there is no immediately foreseeable benefit. This discomfort drives them away from activities that require time or effort with little short-term reward, even when there is high long-term payoff. Motivation problems occur as a function of two factors: time and perceived reward value. Long delays for payoffs reduce the likelihood that the teen will complete the activity or change the behavior. Marcus will be much more likely to study for tomorrow’s test than one that is scheduled for next week.
If the teen perceives little benefit to the behavior (low perceived reward value), he or she also is less likely to complete it, even if the payoff is immediate. Marcus may choose not to study for an impending test if he has no interest in improving his GPA or believes that studying will not help his test performance. In teens with motivation problems, dopamine transmission is altered such that an immediate and highly valued benefit to a behavior is often required to overcome the dread of sustained effort. So Marcus may not study for a test unless he decides that studying will accomplish a meaningful goal with immediate payoff.

Thus part of treatment might be a search for natural circumstances that have high reward values to the teen and reduced wait time for payoff. What does this look like? The teen should be encouraged to discover environments that maximize the presence and frequency of valued natural and adaptive reinforcers. In Marcus’s case, this means finding a high school with a strong soccer program, a team that values him, and academic electives that engage his interests.

In addition to maximizing the presence of natural environmental rewards, therapeutic work can strengthen teen response to these built-in contingencies by increasing their perceived value. Marcus may enjoy soccer, but helping him comprehend the benefits of this activity (e.g., building social relationships, physical activity, developing leadership skills, recognition from adults and peers, college acceptance) may strengthen the perceived value of soccer. Marcus may embrace the benefits of soccer but not believe he has the academic ability to qualify for athletic participation. Thus work may also build a teen’s self-efficacy, forging beliefs that adaptive behaviors are worthwhile because they are likely to lead to desired rewards. Earlier, it was mentioned that one way this can be done is by enacting a contingent structure in the short term that spurs skill use and allows adolescents to witness themselves being successful. During therapy sessions, appropriately processing this initial success can clarify the relationship between hard work, skill use, and successful performance. Exploring the benefits of successful performance (e.g., athletic eligibility, pleasing a parent, higher school grades, increased self-worth) can further strengthen the perceived value of natural rewards associated with teen efforts.

Meanwhile, long-term success for the parent also means therapeutic attention to parent motivational and cognitive factors that maintain maladaptive parenting practices. As part of this process, parents embark on a parallel journey of finding reasons to make and sustain long-term parenting changes (e.g., requiring teens to complete work independently, monitoring and reinforcing teen work completion) by (1) increasing the perceived value of this change (e.g., fostering a positive future for
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The preceding discussion highlights the multifaceted challenges facing teens with attention, EF, and/or motivation problems. As such, maximally effective treatment for these teens often requires multifaceted therapy. Attention and EF deficits can be targeted by teaching teens compensatory skills. Motivation deficits can be treated in the short term through an adult-overseen contingency structure that incites initial teen success—and in the long term by incorporating therapeutic techniques designed to build motivation. Over time, therapy may enhance the perceived value of natural rewards for adaptive behaviors and build adolescent self-efficacy as practiced skills slowly lead to success. Finally, maladaptive parenting processes are addressed in the short term by training parents to appropriately practice reinforcing home structure. In the long term, maintenance of appropriate parenting practices can be encouraged by increasing the perceived value of these parenting changes (see Figure 1.3).

The treatment described herein represents an integrated and developmentally informed approach for teens with attention, EF, and motivation problems. To address the multiple mechanisms of dysfunction in this population (many of whom receive a

There is a well-established literature on using therapy to alter aspects of motivation in adults and adolescents. Once such approach is motivational interviewing (MI), a therapeutic paradigm that has undergone decades of refinement (see Miller & Rollnick, 2013). MI supports the treatment goal of strengthening the value of natural rewards for adolescent adaptive behavior (EF skill use, academic effort) and parent changes (reducing control strategies or increasing oversight of academics). MI also supports the treatment goal of building self-efficacy in teens (helping adolescents see that adaptive behavior will lead to receipt of valued natural rewards) and parents (helping parents see that when they change their parenting style, changes in the adolescent’s home behavior will follow). MI can accomplish these goals by guiding the client to discuss changes in a way that increases discussion of the positive aspects of change and reduces attention to arguments in favor of the status quo. Chapter 4 provides a full discussion of the use of MI in parent–teen treatment for attention, EF, and motivation problems.

TREATMENT MODEL

The preceding discussion highlights the multifaceted challenges facing teens with attention, EF, and/or motivation problems. As such, maximally effective treatment for these teens often requires multifaceted therapy. Attention and EF deficits can be targeted by teaching teens compensatory skills. Motivation deficits can be treated in the short term through an adult-overseen contingency structure that incites initial teen success—and in the long term by incorporating therapeutic techniques designed to build motivation. Over time, therapy may enhance the perceived value of natural rewards for adaptive behaviors and build adolescent self-efficacy as practiced skills slowly lead to success. Finally, maladaptive parenting processes are addressed in the short term by training parents to appropriately practice reinforcing home structure. In the long term, maintenance of appropriate parenting practices can be encouraged by increasing the perceived value of these parenting changes (see Figure 1.3).

The treatment described herein represents an integrated and developmentally informed approach for teens with attention, EF, and motivation problems. To address the multiple mechanisms of dysfunction in this population (many of whom receive a
clinical diagnosis of ADHD, a learning disorder, or an ASD), this approach combines training in compensatory skills, parent–teen collaborative contingency management, and MI. This integrated treatment (which we refer to as Supporting Teens’ Autonomy Daily, or STAND for short) is an autonomy support approach that engages parents and teens in age-appropriate and collaborative care. Other treatments for this population may not be integrated—including training only in EF skills, parent behavior management, family communication skills, or cognitive restructuring. STAND seeks to be an accessible approach that helps parents and teens understand how the brain influences behavior (why teens have trouble paying attention or controlling impulses) and what steps they must take to find success. STAND’s integrated approach frames treatment for any adolescent with significant impairments in attention, EF, or motivation domains—regardless of clinical diagnosis.

1. Develop compensatory skills.
2. Identify environments that maximize presence and frequency of salient natural rewards.
3. Create an age-appropriate contingency structure by contracting with the parents to overcome short-term motivation problems.
4. Support parents in practicing consistent implementation of adaptive parenting skills.
5. Use MI to increase perceived value of natural rewards in the teen’s environment and enhance teen self-efficacy for achieving success (long-term improvement in motivation).
6. Use MI to increase the parents’ perceived value of making parenting changes and to enhance parents’ self-efficacy for influencing teen behavior (long-term maintenance of parenting practices).

Figure 1.3 • Treatment goals for adolescents with attention, EF, and motivation problems.

EMPIRICAL SUPPORT

We began the process of evaluating STAND’s efficacy by piloting the treatment with 36 families. To test how STAND compared with typical community resources, half of our sample was randomly assigned to receive STAND while the other half pursued usual care in the community. Parents, teens, and teachers of teens in both groups filled out questionnaires about the teens’ functioning before treatment, mid-way
through treatment, and after treatment. We also collected observational measures of the participants’ organization skills and school grades.

This first pilot study (Sibley et al., 2013) indicated that therapists found the new approach to be user-friendly, that all families completed treatment, and that nearly 90% of families took the step of scheduling a meeting with the adolescents’ schools to discuss integrating home and school treatment approaches. Both parents and teens rated treatment as highly credible—they believed it addressed the problems that initially led them to present for help. Furthermore, both parents and teens reported that they enjoyed working with the therapists. We found these results encouraging given initially high levels of discord in the early didactic version of our program—these data suggested that MI might be helping engagement.

With respect to parental consistency, by the end of treatment, a majority of parents reported daily contingency management to reinforce adolescent skill use. Adolescents reported that the most helpful part of treatment was time spent discussing goals and interests, as well as creating a new structure at home that put responsibilities before enjoyable activities. Parents reported that the most helpful aspects of treatment were skill modules delivered to the adolescent. All families were highly satisfied with treatment.

Our preliminary work with this small group of families suggested that, compared with the community treatment group, adolescents who received STAND used EF strategies with greater frequency, more consistently recorded daily homework assignments, earned higher grades in school, and experienced sizable reductions in inattention and hyperactivity/impulsivity symptoms. In addition, parents reported the reduction in oppositional behavior and conflict at home.

To further test STAND with a larger sample of teens, we conducted a study in which 128 adolescents were randomly assigned to receive the program or a community control condition (Sibley, Graziano, et al., in press). Prior to treatment, after treatment, and 6 months later, parents, adolescents, and teachers provided similar ratings to those in the pilot study. Once again, adolescents who attended treatment made significant improvements in skill use, ADHD symptom severity, and organization skills relative to the community group. These effects were maintained 6 months after treatment ceased (see Figure 1.4).

Taking a closer look at parent changes during treatment, this study revealed that parents who participated in STAND were more likely than those in the community group to set a structure at home that required responsibilities to be completed before
enjoyable activities. Most important, compared with parents in the community group, parents who participated in STAND reported lower levels of parenting stress after completing the program. This effect also was maintained 6 months after treatment. Interestingly, to arrive at these positive outcomes, parents made different types of changes—some increased their oversight of the teen’s school work and daily responsibilities, whereas others decreased their micromanagement, allowing the teen to take on more independent work. Each family appeared to create its own unique pathway to improve life at home and school.

We are currently conducting additional research to better understand how a treatment such as STAND might best serve families. One study compares STAND delivered in its typical individual parent–teen format with STAND delivered to families in a group setting. Our hope is to understand whether mechanisms of integrated treatment can be engaged in this lower-resource approach. We also recently began piloting STAND delivered via videoconference to families who live too far from our clinic to receive treatment in person. Results thus far are encouraging. Finally, we began an initiative to train community therapists to deliver STAND in community mental health agencies. Our goal is to understand how STAND may be adapted to best serve adolescents receiving treatment in a variety of treatment provision settings.
CHAPTER 8

WHAT CAN MY NEWBORN DO?

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Little Kids, Big Dilemmas
By Sarah Kuppen
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There has long been a misunderstanding about babies. A well known nineteenth century psychologist said babies see the world as one ‘great, blooming buzzing confusion’ (William James, 1890, *The Principles of Psychology*, p. 462). We now know that this simply is not true. Babies come pre-programmed for learning, and are very choosy in how they focus their attention. Babies tune into the things that matter and quickly block out those that don’t. They also come equipped with a wide range of survival skills. Many of these are related to forming social attachments.

**THE NEWBORN’S PREFERENCE FOR FACES**

Given that they are completely dependent on others for food, shelter and comfort, it’s not surprising that babies are intent on forming emotional bonds. They conduct what appear to be mini love affairs with their primary caregivers. A baby’s every behaviour is designed to keep a caring adult close by; their survival instincts are in full effect.

From very early on, experiments show us that babies have brains wired to prioritise social interaction. For example, infants only a few hours old prefer to look at features which resemble a face. While these newborns will pay close attention to a moving head shape, with two eyes, a nose and a mouth, the same two dimensional cut-out with scrambled features is not of much interest (Johnson, Dziurawiec, Ellis, & Morton, 1991).

Clearly, newborns recognise and prefer the human arrangement of facial features. They are also sensitive to where someone is looking, and strongly prefer to look at a
face which is looking back at them. Sharing eye gaze supports development, as it promotes effective communication between adult and baby (Farroni, Csibra, Simion, & Johnson, 2002). It also supports attachment.

**WHAT IS ATTACHMENT AND ATTACHMENT BEHAVIOUR?**

Attachment is a term used in psychology to refer to the connectedness between individuals. In relation to parenting, it can be understood as the emotional bond that encourages nurturing between you and your child. A secure, or good quality, attachment is what we are all after. In a secure attachment an infant’s needs are responded to quickly and sensitively. John Bowlby is the famous figure in attachment theory. He suggests that all humans identify an attachment figure. This is someone near to us who is better equipped to cope with the demands of the world around us. Acting as a secure base, our attachment figure is sought out when we feel stressed or under threat. This physical proximity promotes feelings of protection and security, until we regain our confidence and can return to exploring the world (Bowlby, 1988).

Your newborn is a pro at promoting attachment and eliciting attachment behaviours. In the first days, the infant’s primary attachment behaviour is crying. Crying is a very effective tool. It is the most reliable way that newborns can receive attention and care. Infants will cry from pain, for example following an inoculation, as well as from hunger. You will likely hear a hungry cry from your infant if it has been more than three, or three and a half, hours since her last feed. Babies will cry from the cold, which will warm them up, and will cry when put down or left on their own. Some babies will continue to cry even after having been picked up, or may cry for no discernible reason whatsoever! Six weeks marks the peak frequency for crying, and it will decline from this point onwards. By the age of about two and a half months, most infants should be crying in relation to some discernible factor, rather than at apparently random times [Zeifman, 2001]. Smiling is a much less aversive attachment behaviour. As a newborn, most smiles will take place during sleep. However, when she is a bit older, probably around the age of two months, your child will most often be smiling when awake. Early on, familiar faces and voices will be the most common reason to smile. But from about three months onwards she will smile more readily when engrossed in one of her favourite games, peekaboo being a good example (Fogel et al., 2000).
The life of a psychologist is not all work and no play. One well known set of experiments involved sticking a tongue out at a newborn baby! Children just a few hours old have been shown to copy an adult who sticks out his tongue, opens his mouth wide, and makes what looks like a kissing face (Meltzoff & Moore, 1977). While it is fun to try this at home (finally, a science-based excuse for making faces at your baby!), don’t feel worried if you don’t get a reaction. Many babies will not oblige. In fact it has been questioned whether these babies are imitating at all. Many infants will start a rooting reflex when excited, which can look very similar to tongue protrusion. This is a much simpler explanation. There is also a second question as to how much a newborn can actually see. The poor spatial resolution and contrast sensitivity of the newborn would limit her ability to process facial expressions (Barbu-Roth et al., 2009).

NEWBORN SENSORY ABILITIES AND DEVELOPMENT

WHAT CAN A NEWBORN SEE?

A newborn’s vision is very immature. She cannot see any detail at a distance. However, she does detect some visual information, primarily related to changes in brightness and the movement of objects. For example, her hands will move in the general direction of an object that you have dangled in front of her face (Von Hofsten, 1982). Also, an infant’s stepping reflex can be used as a measure of what she sees. The stepping reflex occurs when a newborn is held upright, with the soles of her feet touching a hard surface. In this position, most infants will move their legs, as if they were walking. When infants are placed upon a projected image of a forward moving checkerboard, they make more steps than when they are placed on a moving pattern of clockwise rotating pinwheels (Barbu-Roth et al., 2009). This suggests that newborns use visual information to guide their actions.

Visual acuity refers to the ability to see the shape and detail of things. An infant’s acuity is measured by presenting two images, one alternating black and white stripes, the other a solid screen. To gain a measure of acuity, stripe width gradually gets narrower, until a child can no longer tell the two images apart. Your newborn’s acuity is about 40 times worse than an adult’s. By six months of age, this has reduced to eight times. Adult levels are reached between ages four and six (Lewis & Maurer, 2005).

Despite poor visual acuity, it is remarkable that newborns only four weeks old can recognise and prefer their mother’s face (Bushneil, Sai, & Mullin, 1989). Below you can see a simulation of what a newborn infant might see of faces at different
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distances (Von Hofsten et al., 2014). Despite poor early vision, infants may be able to recognize their mothers by facial features alone (Bushneil, Sai, & Mullin, 1989), particularly at close distances.

Newborn hearing screening is used to identify children with permanent hearing loss as early as possible. Usually, the test consists of placing a small device in your baby’s ear and playing clicks. When you hear sounds, the cochlea, or the inner ear, responds. Screening equipment, which will indicate whether or not your baby has passed the test, picks up this response. If your baby does not pass the screen, it does not necessarily mean that she has permanent hearing loss. She may have been unsettled during the test, or there may have been background noise in the room, or she may have had fluid in her ears. Your baby will be offered another test to confirm her results.

HOW WELL CAN NEWBORNS HEAR?

After birth, a baby’s middle ear and nervous system develop quickly, allowing high pitched sounds to be heard. The processing of lower pitched sounds comes later and reaches adult levels by age ten. A newborn can recognise and show a preference for the sound of a mother’s voice (DeCasper & Fifer, 1980). In order to develop mature

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Failed hearing check

I’m a bit worried about my baby’s hearing. We’ve just come home from the hospital. While we were there, she had a routine hearing check, which she failed. They said not to worry, but does this mean that she is likely to have hearing problems?
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hearing, children need experience with common sounds. This familiarity will allow them to pick out sounds in the environment (Werner & Marean, 1996).

One sound to which your newborn is particularly sensitive is the crying of other infants. Infants only a few days old will cry to a recording of other infants crying. However, they won’t respond to the cry of older infants, or other species, in the same way (Martin & Clark III, 1982). Interestingly, they will also not cry, and will in fact stop crying, if they hear a recording of their own cry.

WHAT ABOUT SMELLING?

Newborns are amazing in their ability to smell and to root out a mother’s nipple. Babies only a few days old can recognise and prefer the smell of their own mother’s milk compared to others. This is true even if the infant has had no experience of breastfeeding. The smell also provides comfort. For example, infants undergoing a painful procedure show lowered stress levels (as measured by salivary cortisol) when the air is sprayed with a mist of their mother’s breast milk (Nishitani et al., 2009).

FREQUENTLY ASKED QUESTIONS – BABIES

What is attachment parenting and should I be doing it?

Attachment parenting is associated with a number of practices such as breastfeeding on demand, baby carrying, co-sleeping and empathic responding. It is argued by its supporters that these practices promote secure attachments that are in turn thought to relate to positive child outcomes. What parenting strategy you adopt is an entirely personal choice. Read widely and choose an approach that resonates with you, or just follow your instincts.

Is carrying my baby in a sling a good idea?

Carrying your baby close to you promotes quick and easy responding. It also leaves your hands free to get things done, while still having your infant near to you. In an experimental study, children of mothers given cloth slings to use were more often securely attached than those given plastic infant seats placed near to the mum (Anisfeld, Casper, & Nozyee, 1990).

Carrying skin to skin, known as kangaroo care, is related to improved developmental outcomes in preterm infants (Feldman, Rosenthal, & Eidelman, 2014). Again this close contact supports sensitive responding but also allows your baby to benefit from your warmth and heartbeat and can help premature babies to regulate their responding.
Does attachment quality have long lasting effects?

John Bowlby’s theory of evolutionary attachment suggests that by age two our attachment experiences contribute to our view of ourselves and others. This is a concept known as the internal working model. This model is used to predict and inform our behaviours throughout life. Specifically, it may feed into our expectations when forming future relationships.

The ability to establish an emotional attachment is a highly adaptive feature as it so strongly promotes our survival as individuals. As a result of natural selection, infants are born with a number of attachment promoting characteristics. Babies are tuned into faces and the mother’s voice, but additionally humans grasp, root for the breast and spend a good deal of time crying right from birth.

Do premature babies require special care?

Preterm babies often start life with an extended stay in hospital. This can be stressful for parents and can often get in the way of those first bonding moments with baby. Hospitals, however, are now particularly concerned with providing opportunities for skin to skin contact for baby and caregiver. In many cases, bonding through physical closeness may be a possibility.

Premature children may require ongoing special care. This is really dependent upon the particular circumstances and health of your child. In general, the best advice is to keep a close eye on your child’s development. In this way, if any difficulties do arise, you will be able to quickly access the appropriate help.

Have you heard of the magic baby hold? Does it work to stop babies from crying?

A paediatrician has posted a video of a technique he uses to settle crying babies in his practice. The clip is extremely popular, and the method has become known as the ‘magic baby hold’. While it is an appropriate and likely reasonably effective method, it won’t work all of the time. For example, it is less likely to work on colicky babies and babies who have been fussing a long time, or in situations where parents are exhausted. The technique involves the doctor folding the baby’s arms across her chest with one hand. He then props up the baby’s chin with his fingers and, holding her upright and slightly leaning forward, wiggles her back and forth. The method is appropriate for babies up to two to three months old.
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I have heard that it’s important to have a parent facing buggy. Is this true?

The evidence supporting the importance of parent facing buggies is very limited. The idea here is that children in a parent facing buggy will be able to see and hear you talking more easily. Parents will also be able to interact with the infant and respond more quickly to the infant’s needs. Observational studies have found that conversation with children when out shopping in traditional buggies is limited. However, it’s not clear that this would necessarily change with a parent facing setup.

Why do babies get so upset if you respond to them with a blank expression?

Babies as young as three months know when you’re not feeling right, and they don’t like it. For example, perhaps you have been interacting, maybe playing a game, and you then stop. If you show no expression on your face, babies will look away frequently, their heart rate will go up, and they will smile less often. If you leave your face this way longer than a couple of minutes, they may even start to cry (Toda & Fogel, 1993). Such experiments have not been run in an attempt to be cruel to young children, but they aim to understand what effects maternal depression may have on our babies. It appears that behaviour such as unpredictable emotional reactions can be stressful for babies and can cause issues related to developing secure attachments.

Does my baby have any self-control?

Research suggests that infants have innate reactions to experiences designed to bring about an emotional response. For example, a scary face will provoke fear, and blocking access to a toy will provoke anger or frustration. However, how infants react to these provoking situations differs according to temperament. This means they vary in the speed and intensity with which they react to something. There are also differences in a baby’s display of self-control, or self-regulation. This refers to how well your baby is able to soothe herself, and whether she uses behaviours such as looking away, sucking or moving close to a caregiver.

How can I tell whether my baby’s smile is for me, or just wind?

New evidence refutes the conventional wisdom that social smiles, or smiles directed at someone, do not appear until six weeks. Most babies smile in the first month, and parents suggest some of these smiles may be sociable (Addyman & Addyman, 2013). Social smiles are more likely to appear after you’ve done something silly or unexpected with the desire to amuse your baby. Of course, it’s impossible to know for sure. Much to your enjoyment, most infants will be regularly laughing by three months.
How can we possibly know what infants can do or are thinking?

It is true that infants have very few means by which to convey thoughts and abilities through behaviour. However, while limited in number, scientists do have a few tried and tested techniques.

In very young children, experimenters rely on tapping inbuilt biological behaviours such as sucking and head turning. In both situations the child will undergo what is called operant conditioning. Here, the infant learns to draw a relationship between performing a certain action, such as sucking quickly on a pacifier or turning the head, and the start of something happening, for example a sound recording turning on. Once the relationship between the two has been learned, an infant can essentially let her wishes be known to the experimenter and conclusions can be drawn.

Another way for an experimenter to explore an infant’s thoughts is through what is called habituation. This technique relies on babies becoming bored because they have repeatedly been shown the same thing. The experimenter can then look to see what re-interests her, in this way providing an indication of what has been judged as new by the infant.

A final technique commonly used in infant research is preferential looking. Here, infants are presented with two items and are seated in a way such that only one item can be viewed at a time. The experimenter then records the child’s looking behaviour and assesses whether she looks at one item longer than the other. If there is a significant difference between the two, it might be that, firstly, she judges the items as different and, secondly, that she finds one more interesting than the other. The experimenter can then use this information in relation to the questions she is asking.

I’ve heard that babies can do maths; what’s that all about?

There has been a controversial claim that babies have a general sense of number. So, for example, two spoons are very different from two nappies, outside of their ‘twoness’. The question is, can babies see the common ground represented by number? A few studies have suggested that babies as young as six months can tell apart groups where the number of dots differs (in this case, 8 versus 16), even when lots of clues, such as how big the display is, are not available (Xu & Spelke, 2000). This research would suggest that babies have an approximate sense for numbers that develops spontaneously, before experience with counting or any formal arithmetic.