

# Child Hypnosis

## Assuring Successful Hypnosis Sessions With Children

It seems ridiculously basic, yet, it's important to remember that a child's problems are as important as an adult's. Children need to be treated with as much respect as given to any adult who comes to us. They don't need to be "talked down to." Children may not have as many years; but, just as with adults, imprints are planted in their minds, from the time they begin life, by whatever they've seen and learned from parents, relatives, teachers and peers. Whatever a child has experienced, it has been as strongly received as any complicated thing that's happened in an adult's life. The difference is that children are still bound to whatever their parents wish for them and for themselves.

An effective session deals with the parent's concerns for the child, while honoring the child's desires and needs. Information is gathered, in order to determine how best to approach the child's problem. A professional hypnotherapist will have discussed possible questions before they were asked, in order to clarify how sessions will be conducted, and to clear up any misconceptions about hypnotic processes.

### Building Rapport With The Parent

Good rapport must be developed with both parent and child. What makes working with the child unique is not so much their problems, or even the techniques or tools the hypnotherapist may use, but having the parents as a contributing factor. From the first meeting with a child, the hypnotherapist is also dealing with that child's parent(s). Establishing rapport with them is as important as establishing rapport with the child. In one way or another, a parent can support or ruin the work you do. They can be supportive or detrimental to the child.

The child's problem may well be brought about by a parent, or, at the very least, acerbated by them. Keeping the parent feeling that they are part of the process, without violating the child's confidentiality is important.

Explaining some of this to the parent, at the beginning, and speaking to the parent after a session, goes a long way in keeping the communication open, and in justifying the parent's confidence in the process. To keep rapport, the therapist meets back with the parent(s) with any recommendations, including possible "homework" or other support.

### Locating the Source

When a child is brought in for any serious issue, it should be assumed that there may be some deeper problem, for which this is just a symptom. In such cases, the hypnotherapist has a number of techniques to find the problem and effectively deal with the primary cause.

### The Origins Of Children's Problems

Much that goes on in our world can cause problems to children, just as well as to adults. Rapid physical growth over short periods of time, and concerns about changes in their bodies can cause stress and loss of self-esteem. Various problems in school, with studies, teachers or peers, may be troubling a child.

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There are many fears that can plague children: [fear of the potential of danger in our schools today](#), [fear of the dark](#), [fear of going to sleep](#), [fear of doctors, dentists and needles](#), etc.

Many children experience the embarrassment of habits they find hard to break, like bed-wetting or thumb sucking. A new baby or other addition to the family can cause undue stress. Loss of their own bedroom space due to a new addition to the family, or having to move to a smaller place can make children unhappy.

An underlying fear of kidnapping and other abuses may affect our children far more than we realize. It's difficult to keep such news away from a child's hearing, these days.

With children, the world revolves around them, until experience helps expand that world. As they are the "center," then everything is where they are. If there are problems in the family, they take on those as their own. If parents are having trouble in relating well, their children can become fearful and guilty, as if they were the cause or should have prevented it in some way. This is what creates ["ADULT CHILDREN."](#)

## School and Learning Influences

The loss of a friend, who moves away, being shamed or frightened by a teacher or principal, the death or serious illness of a school peer or teacher, boredom with school, having to make new friends, unfamiliarity with schoolwork, as well as falling behind in a subject or being "behind" the other kids, and other comparisons are common problems for many children, and can cause excessive stress.

The insistence upon *"correct"* performance in front of others in a classroom can be extremely hard on a shy child. Someone in school or the neighborhood who threatens or bullies other children, and the general fear and pressure of drugs and guns are serious concerns and create high stress for children, in many schools.

## Societal Influences

The Media - Our modern century provides an enormous spread of negative influences on our children. Television and movies regularly present violence, sex and innuendo as the norm. Shallowness and self-centeredness are projected by sit-coms on TV by unmarried 30 year olds, who are totally wrapped up in themselves. Advertising and acquisition are other primary images, as parents go crazy trying to get the child whatever the child wants.

News events on TV - War and resulting migration of homeless families, famine and other tragedies within countries, kidnappings, abuse and other mayhem against children, and the latest disease or other terrors are projected on the screen, nightly, inundating our children, just as they do adults. And children are just as impacted as their parents by this constant onslaught of negative messaging.

A car at age 16 is a must. Slimness for women and powerful bodies for men are major images projected by television, movies and magazines. Fear of retirement, ill health and the desire for youthfulness remind us, ["For god's sake, don't get old or your life will be over."](#)

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Millions are spent every year in keeping us beautiful forever, and in staving off eventual death. Children receive this information by words or inferences from the time they are born, unless they have parents who find ways to help them keep a balanced approach to life and living.

## Family Influences

When children are brought to a hypnotherapist's office, they come with their parents. And those parents may reflect the other factors that contribute to a child's problem.

Parents often lose sight of the impact of major events or stress in the family upon the children. Often, adults make the mistake of believing that children are resilient. They don't speak to them about difficult situations, yet will speak "around," or in front of them, as if they weren't there or didn't understand, anyway. Many times they don't bother to ask the question of "why," when a child is troubled. Often, parents perceive their children's problems as rather unimportant, in the light of their own difficulties.

Problems children face are dissatisfied parents who can never be pleased, a parent who expects too much, individual family members who are chronic worriers, and negative parents for whom the glass is always half empty. Death in the family, divorce or other important separation, loss of a parent or favorite grandparent, an abusive sibling who teases or shames, arguments between parents, even violence, an addictive parent or step-parent, an older sibling leaving for school without them, violence or sexual abuse toward the children, a depressed, anxious or highly strung parent, a parent or sibling who is physically ill much of the time, and moving away from other members of the family, or friends are other problems many children face. They must be considered when dealing with the child's presenting symptoms.

## Influence of Peers

Although possibly more strongly felt once children reach pre-teens, even smaller children are affected by their friend's choices and experiences. Moving to a new school, having to make new friends, handling bullies, unfamiliarity with schoolwork, as well as falling behind in a subject or being "behind" the other kids, and other comparisons, are common problems for many children. Being teased for being the "wrong" height or weight, or for not fitting the status quo embarrasses some children. The struggle to belong and rejection by groups become especially hard on pre-teens and teenagers.

## How Stress Can Affect Children

When children are experiencing unrelenting stress or are worried, whether or not they are conscious of it, there are warning signs for those who have the eyes to see. Schoolwork may begin to slide. They may begin to lose things on a consistent basis, steal, become accident-prone, have headaches or stomachaches, bite their nails or pull hair or lashes.

They may return to wetting the bed, after having been dry for some time. Health problems may start cropping up. Other people may notice a dramatic change in disposition. The child may begin to stop wanting to go to school, or begin to cause problems in the classroom. They may lie and have other

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avoidance patterns. They may turn to drugs or alcohol. They may begin to have trouble sleeping, experience frequent nightmares or sleep walk.

## Hypnotizing Children

When we speak of child hypnosis we are generally referring to children between the ages of 6 and 12. Most children in this age bracket will enter hypnosis very quickly and easily. They are virtually all direct receivers (physically suggestible) and are easily hypnotized by almost any method you should choose. However, just as with adult clients, it is important that the child wants to change and is willing to work with you.

A deep trance state is not necessary for great results. They are basically in a trance most of the time. Up until the age of 8, most kids have a brain wave pattern that shows alpha wavelength about 80% of the time. Of course, Alpha is similar to a hypnotic trance. That's what children's make-believe is all about. We call it visualization. For children it is most of their waking state.

Once a child has developed an adequate attention span (about age 6), hypnosis is easy. Children spend most of their waking hours playing games and indulging in fantasies or pretend experiences and become totally absorbed. For this reason, play can become an excellent method for implementing therapeutic suggestions. Hand puppets and stuffed animals can easily capture a child's attention and therefore make excellent tools for implementing suggestions.

Children are great discoverers. With limited life experiences, they are hungry and open to new learning. They enjoy responding to new ideas that are presented in a way they understand. Their openness and imagination make them good subjects for hypnosis.

Children do not realize the potential power of visualization, yet they have a natural talent for dreaming and for imagining things in their minds. They respond beautifully to fairy tales and bedtime stories and like to imagine that they have a part in the story being told.

Prior to beginning any program, you should take the time to interview the child; to find out what the child likes and dislikes. This will ensure that the best imagery is used, and the child will have a positive response to hypnosis. It will also help you to determine if the child wants to change and is willing work with you.

In the pre induction explain to the child what you are going to do and what the hypnosis experience be like for him/her. Then follow through by doing exactly what you said you would do. This builds the trust that is necessary for a successful relationship with the child.

Both parents and child should understand what hypnosis is and what it can do. It is important for you to stress that for the child the experience of hypnosis will be easy and fun. Only when all questions are answered can the work begin.

When children work with an adult they trust, they can easily become relaxed and focused, open to ideas that will help them to deal with the world they are facing.

The first session involves the child, the parents, and the therapist. After getting acquainted and

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establishing trust, you and the child identify what the problem is and what the child wants to do about it.

All hypnosis work should be done with a parent close by, preferably in the same room, seated near the child. There will be cases, however; when the child will need to be alone with you in order to tell you certain things. Always ask the child if it is OK for the parent to be in the room. If the child says “Yes” that is the better situation.

When the child is ready to begin the hypnosis process, simple methods are best. You should always use stories, visualization and positive suggestions that are appropriate to the age of the child.

The easiest way to hypnotize a child is the basic eye fixation method. Have the youngster focus on a point on the wall, a swinging pendulum, or perhaps a turning disco light. The focus of the child's gaze should be fixed so that the eyes are turned upward, creating a slight strain on the eye muscles..

Have the child gaze steadily at the focus point until their eyes begin to feel heavy, and they become sleepy. You now have them in a trance-like state. Once they are in this state, you begin therapy. This can be your telling the child stories that will alleviate whatever problems they may have.

Perhaps the only difficult part about child hypnosis for the therapist lies in the fact that, when in hypnosis, children in this age bracket do not behave in the same manner as adults. While you would expect an adult to be passive when in the hypnotic state children are prone to move around, change position often, wiggle and squirm. For this reason it is sometimes difficult for the student of hypnosis to determine when the child is at a proper depth to do therapy. Here, experience is the best teacher.

## What is a session like for a child?

The first session involves the child, the parents, and the therapist. After getting acquainted and establishing some trust, the therapist and the child identify what the problem is and what they want to do about it. The parents will usually have some (or a lot) of input into this conversation. Often the viewpoint of the parents differs considerably from that of the child. As the hypnotherapist, don't take sides. Don't scold or chastise the child. Listen to both sides of the situation and then reassure the parents and the child that this (whatever it is) is a solvable problem.

Just as with adult clients, it is important that the child wants to change and is willing to work with you, the therapist. Both parents and child should understand what hypnosis is and what it can do. Only when all questions are answered can the work begin.

All work is done with a parent close by. A child may need to be alone in order to tell the therapist what she needs to know, but if the child is more comfortable with the parents in the room, it is much better.

Always ask the child if there is anything that he/she wants to discuss with you in private. Sometimes they will say *yes* and other times they will say *no* even when they would really like to

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talk to you privately. At the beginning of every session always give the child the opportunity to have a private discussion.

After all discussions have been completed and you have your session plan completed ask the child if he/she wants the parents present for the session. You must always comply with the child's wishes.

Quiet often the child will indicate that it doesn't matter either way. In these situations ask the parents to please sit in. In virtually every case the parents will be impressed with the work done in the session. This is important because they are the ones paying for the therapy.

When the child is ready to begin the hypnosis process, use only simple methods. Usually an eye fixation induction is all that is necessary, which may or may not be followed by a progressive relaxation. Always use a tone of voice, stories, visualization and positive suggestions that are appropriate to the age of the child.

Children between the ages of 6 and 11 or 12 may differ considerably from adults in their physical response to hypnosis. It is not uncommon for children to open their eyes and look around or even move around the room while in hypnosis. These actions do not indicate a lack of workable trance.

**When the session is over the therapist must spend a few minutes with the parents to give them a brief overview of the session.**

**The following information should be provided to the parents of the child client either in written or verbal form, before or after the child's session.**

An empty vessel to be filled or a lump of clay to be molded is often how parents see their newborn's potential for growth and development. According to the latest research on brain development, a newborn's brain is remarkably unfinished. The brain, the body's most vital and complex organ, matures outside of the womb. Therefore, babies are deeply affected by their earliest experiences.

Diane Arnold, vice president of education for Children's World Learning Centers, Golden, Colo., emphasizes that positive emotional, physical, and intellectual/language experiences in a child's earliest years are just as important as a healthy diet and a safe place to live. To encourage the healthy development of a newborn, parents need to know that it is the earliest interactions with themselves and other caregivers that most affect the way a baby's brain becomes "wired" for later learning. These interactions determine the potential for the way youngsters will learn, think, feel, and behave for the rest of their lives.

A baby is born with more than 100,000,000,000 brain cells. Before the age of five, long, thin fibers called synapses grow and connect the brain cells, forming the neurological foundation of trillions of connections upon which a child builds a lifetime of skills. The final number of synapses is largely determined by his or her earliest experiences. Brain growth early in life is unparalleled. At no other time in life does the brain master so many skills or does experience etch so deeply in the mind. It is during these first few years that potential vocabulary, math, and logic skills are largely determined and emotional stability is greatly affected.

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Parents and early childhood educators have the greatest effect on their child's brain potential. According to The Reiner Foundation, there are 10 things parents can do to provide a healthy, stimulating environment for their baby's brain development:

Be warm and loving. Youngsters experience relationships through their senses. Interactions such as touching, rocking, smiling, singing, and talking help children feel safe and secure with their caregivers. Touch is especially important because it stimulates the brain to release growth hormones.

Be responsive to your child's sounds, expressions, and movements. Infants cannot use words to express themselves. Therefore, they feel secure and loved when they are responded to in other ways. They begin to trust that when they cry, they will be comforted; when they are hungry, they will be fed; and when they smile and laugh, they will be played with.

Talk, read, and sing to your child. Making up stories, singing songs, and describing things to infants encourages speech and language capacity to grow, even if they can't understand the meaning of the words. Researchers have found that, when frequently spoken to by their mothers, infants learned almost 300 more words by age two than their peers whose mothers rarely spoke to them. Studies also find that how older children are read to makes a difference. Encouraging participation, such as asking questions, pointing out pictures, and predicting outcomes helps their brains to be even more stimulated and challenged.

Establish routines and rituals. They are reassuring for children and help them learn what to expect and how to understand the world around them. For example, a toddler may know it is nap time because his or her mother closes the curtains and sings a song. Youngsters who have safe and predictable interactions and activities have been found to do better in school later on.

Encourage curiosity, safe exploration, and play. Interactions between a parent and child form the basis for all subsequent learning and growing. As infants begin to crawl and walk they start to explore the world beyond their caregivers. Parents should encourage safe exploration and play, and be receptive when their offspring needs to return to them for security. Play is recognized as an important opportunity for kids to learn and explore.

Be selective with TV viewing. Very young children are still learning the difference between what is reality and what is pretend. Some television images can foster language development, but others can be confusing and frightening. Studies show that those who do best in school have caregivers who limit their TV time and are selective as to the type of shows they watch. For older children, it can be used to foster discussion, but television should not be utilized as a babysitter.

Use discipline as an opportunity to teach. Children need limits and consistent, loving adult supervision. Keep these points in mind:

- Communicate to your offspring what needs to be done at that moment.
- Redirect his or her attention or activity by using neutral or positive language.
- Say no while maintaining love.
- Explain the reason for your rule.
- Give limited tasks and be specific in your request.
- Acknowledge children's feelings, but set limits.
- Help them understand how their actions affect others.
- Help kids use words to communicate their frustrations.

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- Acknowledge positive behavior.

Recognize that each child is unique. Youngsters have different personalities and temperaments, and grow at different rates. Their self-esteem, in large part, is measured by a caregiver's attitude toward them. Give toddlers specific praise and encouragement, such as: "You climbed the stairs all by yourself!" Through this, they begin to see the connections between their actions and a parent's response.

Choose quality childcare and stay involved. Selecting a childcare provider is one of the most important decisions families make. With more dual-income families, childcare centers increasingly are the places where kids are offered activities and opportunities that foster early brain development. Research shows that high-quality child care and early education provide a strong basis for learning and social skills, but what should parents look for in a child care center?

According to Arnold, they should start by visiting a center and observing the interactions and activities between caregivers and children. How does the center look, smell, and sound? Are the children actively involved in educational and fun activities, or are they merely being babysat? Do the activities involve the senses of smell, touch, taste, etc.? Is the environment full of language and reading opportunities? Is the environment clean and safe? How many teachers are there for the number of youngsters in a classroom? Is the center nationally accredited? After choosing a child care provider, stay involved. Develop a relationship with the teacher(s) and center director and ask lots of questions. Drop in unannounced occasionally. Ask for progress reports.

Finally, take care of yourself. Parents are the most important part of a child's life, but they need care, too. Because they provide the primary environment for infants and young children, their own health and well-being are extremely important. Their needs for good nutrition, exercise, rest, and regular medical care, as well as time for their own interests and friends, should not be neglected.

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## Other Induction Methods For Children

### **The Rapid Method Induction** (For Children Ages 6 - 12)

#### **Instructions to hypnotist**

While an eye closure technique is suitable for most children, some smaller children will object to it. It is always wise to enquire from the child whether it will be O.K. for him to close his eyes.

#### **Spoken to the subject**

*"Do you like to pretend games, (child's name)? I would like you to pretend something for me, will you? Good. All right, now close your eyes please and while you have them closed, I want you to pretend that they just won't open no matter how hard you try and, so long as you keep pretending, they won't open at all. That's good. Keep pretending until I ask you to stop. Do you have a television at home? O.K., will you switch in on please? What's on? ... Can you turn it up a little? Good. What's happening now?"*

#### **Commentary**

The exact wording is not important here and should be adapted to the circumstances. The objective is to invoke the child's imagination, which normally he/she is using continually in his/her games of pretence, to gain eye closure. When futile attempts to open the eyes are observed, hypnosis has already begun. It is important to secure the child's agreement to maintain the pretence until you direct him/her to stop pretending. With an easy extension of his/her pretence, the child transports himself/herself to his/her home and regresses to a favorite TV program. He/she can be

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asked to describe in detail all that he/she sees and hears going on. Hypnosis is established. The body relaxation normally associated with adult hypnosis is often less in evidence with children who remain physically active through hypnosis.

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## **Television Imagination Method (For Children Ages 6 - 12)**

### **Spoken to subject**

*"I would like to show you and teach you how you can use your "make believe" ability in areas of your life to help yourself. Would you like to learn how you can help yourself with (child's presenting problem)? (Child responds Yes) You already have your own imagination. I cannot give you any imagination. I can show you, however, how to use your imagination in a very special way. First, I would like you to get into a very comfortable position. Just put your legs in front of you, with your hands resting comfortably in your lap. You might notice that, in this position, your whole body feels nicely supported, with every part of your body being held up by something. And now, I would like you to close your eyes - that's right - and with your eyes closed, you can enjoy the darkness and the quietness, the peacefulness, and the calmness. You can become more aware of your breathing. Just feel how cool your breath feels as it comes into your body, bringing with each breath energy and oxygen that spread to every corner of your body. With each breath out, you can feel warmth, and your body can just relax all of the muscles in your body. Every time you breathe out, you go deeper and deeper into relaxation and comfort.*

*As you relax deeper and deeper, I would like you to imagine that a TV screen has appeared before your eyes - a very special TV that would only be found in a very special place. This TV has been made especially for you. Just see the dials on the TV and examine them very carefully and find the ON switch. Just turn on that TV and turn the dial around until you find the program that seems just right for you. It may be a program that you have already seen before, or one that you would only imagine that you would like to see.*

*What is the program that you are seeing right now (child's name)?"*

(Get response from the child and then ask additional questions to increase and enhance image)

*"You can continue to enjoy that picture for a moment more and then I would like you to turn the dial until you reach a channel where you can see yourself on TV and you find yourself in (wherever the therapist wants the therapeutic environment to be) and you are the star in that program. Have you found that channel? (Child responds) Good. What are you doing right now in that picture on the TV? (Child responds) Just continue to watch that program because that is a special TV and you are in control of that TV."*

(Use therapeutic suggestions related to the presenting problem - stress achievements and positive feelings. Use a posthypnotic suggestions that the child can go back to that special channel whenever the child wishes.

You can also ask the child to use "slow motion" suggestions at any time)

*"Now turn your dial to any channel you would like to end with that gives you a nice feeling of being you and a nice feeling of being comfortable and peaceful, of being strong and wise, and knowing what is best for yourself and how to find it. You can thank yourself that you have this special TV in your mind and that you can use it any time you wish.*

*Now it's time for your to turn your set off and to let yourself gradually return to the room here with me, feeling refreshed and relaxed and ready for a nice day - ready to open your eyes now. That was very nice (child's name)."*

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## **Bionic Arm Method**

### **Spoken to the subject**

*"Have you ever heard of a bionic arm?" (Pause for response)*

*(if the child hasn't heard about the million dollar man on TV, explain something about it, especially about his unusual, powerful arm)*

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*"I want to tell you something else about the million dollar man that most people don't know, but you'd probably go around telling everyone else." (Pause for response)*

*(Usually you get the child going, and he/she promises to keep it a secret)*

*"Would you really like to know something special about his arm?" (Pause for response)*

**(Optional:** If using music, start it at this point)

*"One day the million dollar man was sitting at home, listening to music on his radio, and all of a sudden he noticed something very unusual about his arm."*

*(watch to see if his/her eyes move left or right. Then use the arm on the side towards which his/her eyes moved)*

*(Lift his/her arm)*

*"Yes, that's it. It's that arm. It started becoming very stiff, and soon became as stiff as a board."*

*(stroke the arm and say) "Notice that it keeps becoming stiffer ... As stiff as a board."*

*That's a very special arm, as it keeps becoming stiffer your eyes close, and you begin having a very pleasant dream, because that's your dreaming arm.*

*You can hear the music playing as you are beginning to have a very pleasant dream ... Watch the whole dream, and your arm will go down only as fast as you see the whole dream."*

**(Note:** The following sections are for performing therapy)

*"You can tell me all about the dream, and every time I lift your dreaming arm you can have another dream?"*

**(Note:** You can then use the dreaming arm to have the child dream about the cause of the problem and get any information needed to help overcome the problem)

**Example:** When I lift your dreaming arm, you will have a replay, a very clear dream of the entire experience that has been causing (Describe the problem)

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## Eye Fixation with Imagery Method

**Spoken to subject**

*(Child's name) "I would like to teach you something very special that you can learn, and with practice, you can get better and better. The first thing I would like to do is to have you hold this coin (give the child a quarter) up here. (Hypnotist puts coin between the child's thumb and index finger and moves the arm and hand slightly above eye level) I would like you to stare at the coin and concentrate all of your attention on some special part of that coin, and as you do, just let yourself get more and more relaxed. As you get more and more relaxed, the coin will get heavier and heavier."*

*As the coin gets heavier and heavier, your arm will also get heavier and heavier. In a moment, the coin will drop from your fingers and your eyes will close and your arm will come back down to rest in your lap."*

*(Wait for response, and reinforce statements if necessary)*

*"We can now talk about some other pleasant things that can help you to become even more relaxed and comfortable. I would like you to imagine yourself at a wonderful picnic. This is the best picnic you have ever attended - the sky is blue and clear, the clouds are just the way you like them, it's just as cool and as warm a day as you would like it; just let it be the kind of day you would want it to be."*

*You might want to be at this picnic by yourself or by sharing it with some of your favorite friends and playing some of your favorite games. Somebody at this picnic (child's name) has laid a very special blanket on the ground. I would like you to sit down on that blanket by yourself or with a friend. You find out that this is a very special blanket because you can make that blanket fly. You can make it go as high as you wish or as low, as fast or as slow; you can make it turn left or right, you can do anything you want the blanket to do. You are the pilot and you are in control. You can fly anywhere you wish and see anything you want to see. It is a wonderful feeling to fly along on your blanket, enjoying the day and being in control."*

**(Note:** The following two paragraphs can be used when performing therapy)

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*Just enjoy what you are doing on this beautiful day, as you fly along, you might think for a moment (therapeutic suggestions and talk can occur here with the use of ideomotor signals).*

(Continue to reinforce that the child is the pilot and in control)

*Anytime you want to go to this very special picnic and to fly on your blanket, you can do it - always remembering that you are the pilot and are in control. Every time you practice, it will get easier and easier to"* (therapeutic goal).

(**Note:** Return here for trance termination)

And now, (child's name), I would like you to land your blanket in a place that you like very much - a place back at the picnic where you feel comfortable and very relaxed and safe. When your blanket gently touches the ground, you can open your eyes, feeling refreshed, relaxed, and comfortable. That's right. You did a swell job (child's name)."

(Spend a few moments processing the child's experience)

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## **Favorite Place Method** (For Children Ages 6 - 12)

### **Instructions to hypnotist**

During the pre-hypnotic interview, as much information as possible should be gathered about the child's favorite place. This information will be fed back during the session.

### **Spoken to subject**

*"Just make yourself nice and comfortable in the chair. Now I would like you to put your hands on your lap and to use your eyes to find a spot on one of your hands on which you would like to focus all of your attention. It might be a wrinkle or a fingernail. Now that you have found that spot - that special spot on which you have chosen to focus all of your attention - let yourself really concentrate on that one spot; let yourself totally concentrate on that spot that was special for you, concentrate on it just as hard as you can. As you do that, you can still be aware of my voice and you can let all of your body become very relaxed and comfortable. Now in a little time - I'm not exactly sure when, but soon - your eyes will become so relaxed and comfortable that they will want to close.*

*You pick the time that feels just right for you. And when that happens, you can feel even more relaxed and comfortable than you are feeling right now. When that happens, when your eyes close, we can talk about some other very pleasant things that are relaxing and comfortable for you."*

(Reinforce as needed for eye closure)

*"That's it - so comfortable and peaceful from the top of your head all the way down to the bottom of your toes. And when you are feeling so relaxed and comfortable, like you feel right now, you might like to imagine that you are in your favorite place in the whole world. Being there right now. Now, that favorite place might be a place you have really been to before, or a place you have only read about, or a place you have dreamed about. But everything about that favorite place is just the way you want it to be. You might be there by yourself or maybe with some very special friend. Of course, you are doing your favorite activities and everything about the day is just the way you would like it to be. I am not sure where your favorite place is - I imagine it might be (Information obtained from child in interview) I know that you know where your favorite place is and that you are enjoying it right now. You can continue to enjoy your favorite place and all of the things you would like to do while we talk about special things you can do when you are relaxed and in your favorite place - things that can help you."*

(**Note:** If performing therapy, the therapist begins to work on treatment goals with appropriate suggestions and questioning with ideomotor signaling)

*"Now you can continue to be in your favorite place for a moment longer. In the next minute or so, it will be time for you to return to the room here with me, feeling refreshed and relaxed and very good about what you have learned and what you can do when (reinforce therapeutic suggestions) Just let yourself gradually return feeling refreshed and relaxed, ready to open your eyes and to be back here with me. You can go back to your favorite place any time you want.*

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*Welcome back (child's name)."*

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## **Magic Shape Method** (For Children Ages 6 to 10)

### **Spoken to the subject**

*"I want you to listen closely to what I'm saying to you now without moving your head. Just lean back in the chair and get real comfortable, and then I want you to look up toward the ceiling, and look for a tiny spot. That spot will have special meaning to you. It will help relax you, and you may notice as you watch that spot it may begin to change its shape. Tell me when you notice that spot magically changing its shape ... (Pause for response)*

*Now keep watching that spot and you may soon notice it begin to magically change its color. Tell me when you notice that spot begin to change its color ... (Pause for response)*

*As you watch that spot, you are continuing to relax even more and you will soon notice your eyelids relaxing, and your eyes will feel like they want to close ...*

*Without moving your head, just move your eyes now and find another magic spot on the ceiling, and notice how your eyelids keep closing more and more as soon as you notice the other magic spot, and notice also how you can still see the spot after your eyes have closed ...*

*As you keep your eyes closed notice that you can see that spot beginning to change its shape, it is very pretty. It may even sparkle or shine, and it keeps changing its shape as you keep your eyes closed and continue to watch it ...*

*The more you watch that spot with your eyes closed, the more you continue to relax ... and you will soon notice the magic spot becoming smaller and smaller ... tell me when you notice it getting smaller ... (Pause for response)*

*Now notice that it is disappearing completely, and you are becoming drowsier as the spot disappears"*

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## **Magic Television Method** (For Children 6 to 10)

### **Instructions to hypnotist**

You don't really need any introductory preparation for using this induction with a child. Simply have the child get in a comfortable position and close his eyes and listen to the suggestions you tell him.

### **Spoken to the subject**

*"Just keep your eyes closed now until I tell you to open them. And I want you to tell me about your favorite TV program. As you are continuing to feel more calm and relaxed, I want you to tell me about the TV program that you enjoy most of all ... (Pause for response)*

*"In just a moment, with your eyes closed, you will begin seeing your favorite TV program ... you will keep feeling more calm, and relaxed, and peaceful, and safe and secure ...*

*Okay, I'm turning on the TV now, and in your mind you will see your favorite program on the screen. You will hear the sounds and have the feelings and really enjoy watching your favorite program ... You can continue watching that program, by keeping your eyes closed ... You don't need to pay any attention to what I'm saying ... You're just continuing to relax and enjoy that special program by keeping your eyes closed until I tell you to open them and awaken from the hypnotic state ...*

*(At this point you may want to test the state of the child, you can achieve this by saying 'As your watch your show, one of your fingers on your right/left had moves straight out.'"*

*(Wait for response)*

*(The following lines can be used for general therapy .. fill in the specific problem)*

*"In just a moment that program will finish, and we will change the channel ... you will continue moving into an even deeper, drowsier state ... you will be seeing a program that will show you how to overcome that problem and get rid of it completely ...*

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*Your favorite program has ended now, and I'm changing the channel ... you're continuing to feel more peaceful, and now you are seeing a program that is showing what has been causing that problem, and how easily you are getting rid of that problem ...*

*The picture is becoming more clear ... you are understanding it, and realizing that you are overcoming the problem completely ...*

*Later on, when you open your eyes, you will be back in a wide awake, fully alert state, feeling confident and happy. You will notice the improvement, and will keep improving more each day ..."*

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## **Make Believe Friend Method (For Children Ages 6 to 10)**

### **Instructions to hypnotist**

This induction is best used when performing therapy. The use of an all knowing and understanding friend is very helpful in getting a child to discuss their problems. (Have the child close his or her eyes and pretend they are visiting with a new friend. Maybe their friend is a cuddly puppy or kitten, or it may be a little rabbit that likes to be cuddled)

### **Spoken to the subject**

*"Now just keep your eyes closed and pretend that you are enjoying the company of your friend. You are a very special person, and you can really relax and enjoy yourself, feeling calm, and peaceful and safe in the company of your friend ...*

*As you are having an enjoyable time with your friend, you are listening only to my voice ... Now I want you to tell me a little bit about your friend ... (Pause as subject describes friend)*

*Now ask your friend what name we should use when we talk to him or her ... Tell me your friend's name ..."* (Pause for response)

(The following lines can be used for general therapy .. fill in the specific problem)

*"Okay that's good ... Now you can relax even more, and I want you to ask your friend to help you ... Your friend knows about the problem you've been experiencing, and your friend will be able to tell you how you can get rid of that problem completely ...*

*As soon as your friend tells you how to get rid of that problem, I want you to lift one of your hands up toward the ceiling ... (Pause for response)*

*Let yourself continue relaxing ... Bring your friend along now as you begin feeling a peaceful drowsiness all over your body.*

*Now you are beginning to see yourself improving ... You are getting rid of that problem ... You are experiencing some pleasant changes right now, and you will keep improving even more later on after I tell you to open your eyes and come back to a wide awake, fully alert state.*

*You are learning more and more from your friend ... You are aware now that your friend really loves you and cares for you, and is doing everything to help you get rid of that problem completely*

...

*And you will know that you can go back and be with your friend anytime you want to in the future, and your friend will always be there to help you."*

## **Questions Often Asked By Parents**

**I thought childhood was supposed to be an easy time. Why is it so hard for my kids?**

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Childhood is a time of great discovery and learning. Adults can sometimes forget that life can be very stressful for children. While adults are taking care of major events, they can lose sight of the impact on their children, until there is a problem of some sort.

Children grapple with change, learning, loss, and their own, sometimes unwieldy, bodies in the space of a few short years. They deal with new friends and bullies and unfamiliar class work. Sometimes comparisons can make feelings of inferiority or depression rise to the surface. This is prevalent in the early teenage years. In fact during this period kids are particularly cruel to each other in their words and deeds.

## How do I know if my child is having trouble?

Children show their response to stress, change, grief and loss in many different ways. For some, schoolwork may begin to slide. Your child may lose things or steal them. She may have headaches or stomachaches. He might bite his nails or pull his hair. Children often develop fears of needles or doctors or dentists. Bedwetting may become a problem. Particular health problems like asthma and hay fever may be exacerbated. Stuttering may become more prominent. Your child may not be able to put words to the overall feeling of stress, anxiety, tension or lack of self worth.

## Can hypnosis work with children?

Yes, children as young as six years of age are usually great hypnosis subjects. Children are great discoverers. With limited life experiences, they are hungry and open to new learning. They enjoy responding to new ideas that are presented in a way they understand. Their openness and imagination are the elements that make them good subjects for hypnosis.

When children work with an adult they trust, they can easily become relaxed and focused, open to ideas that will help them to deal with the world they are facing.

Most pre-teen are direct receivers because the frontal cortex is not yet developed. However, testing for learning preference (visual, auditory or kinesthetic) is necessary in order to present suggestions with the most effective approach.

On the other hand, teenagers are beginning to develop their own individual suggestibility type. Therefore is it always advisable to test teenagers for suggestibility type and proceed accordingly.

## Here are some of the problems that might be helped by hypnosis:

- **Pain.** Hypnosis is very effective at alleviating the pain of children undergoing cancer treatments. What we do is help the child go somewhere else, away from the pain. By

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accessing the unconscious, the child creates images that forces them to focus on something other than the pain they are feeling.

For example, if you squeezed your hand very tightly to the point that it hurt and then someone asked you to focus on something else, you would not be as aware of the pain in your hand.

- **Anxiety.** A child who is anxious often breathes more quickly and has a higher heart rate. With hypnosis, we can teach them to breathe more slowly, lower their heart rate and take them away from whatever is making them anxious.
- **Bed Wetting.** Many doctors prescribe medicine for children who have a bed-wetting problem. But now more physicians are turning to hypnosis, which has very positive results. Part of the reason that it works so well is that kids play an active role in their treatment rather than just taking a pill.
- **Asthma.** When children with asthma feel their throats constricting, they begin to feel anxious and breathe more heavily. With hypnosis, you teach the child to calm down and bring them to another place.
- **Academics and learning**
- **Addictions:** Chemical or substance
- **Attitude:** Career, Family Interpersonal, School
- **Control Behavior**
- **Concentration**
- **Divorce Trauma** (the trauma that results in children when their parents divorce)
- **Fears, Phobias**
- **Fitness:** Enhance Motivation & Performance
- **Habit Control:** Modify Food & Eating Behaviors, Nail Biting, Procrastination, and Substance Abuse
- **Image Projection:** Change how others perceive you.
- **Motivation:** Academic, Career, Job Performance, Fitness, Health, Personal Achievement, Sports, School
- **Problem Solving**
- **Reading:** motivation, Remove Blocks

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- **Self Confidence**
- **Shyness**
- **Sleep:** More, Less, and/or Better
- **Speaking in Public:** Speech, Audience Rapport, Concentration, Memory, Presence of Mind on Stage, Stage Fright, Communication Apprehension
- **Sports Performance:** Competitiveness, Sportsmanship, Concentration, Drive, Image, Rehearsal, Peak Performance, Practice Effects
- **Stress, Tension:** Anxiety Attacks, Hypertension, Panic Attacks, Relaxation, Stress Management
- **Subliminal Communication and Body Language**
- **Timing:** (time awareness, internal clock, etc.)
- **Weight Loss:** Reprogram the subconscious for desired size, shape and weight, Control (dieting, eating disorders, metabolic influence) and make a permanent lifestyle change of healthy eating and exercise

## One Reason Teenagers Respond Differently To The World And Hypnosis - Immature Brain Circuitry

We used to think that teens respond differently to the world because of hormones, or attitude, or because they simply need independence. But when adolescents' brains are studied through magnetic resonance imaging (MRI), we see that they actually work differently than adult brains.

At the McLean Hospital in Belmont, Mass., Deborah Yurgelun-Todd and a group of researchers have studied how adolescents perceive emotion as compared to adults. The scientists looked at the brains of 18 children between the ages of 10 and 18 and compared them to 16 adults using functional magnetic resonance imaging (fMRI). Both groups were shown pictures of adult faces and asked to identify the emotion on the faces. Using fMRI, the researchers could trace what part of the brain responded as subjects were asked to identify the expression depicted in the picture.

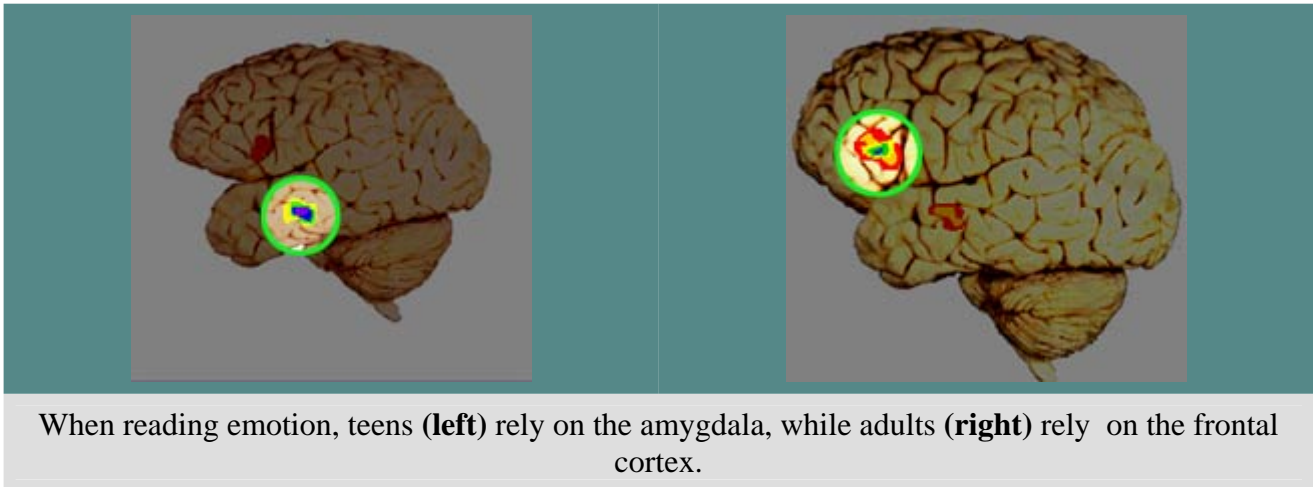
The results surprised the researchers. The adults correctly identified the expression as fear. Yet the teens answered "shocked, surprised, angry." And the teens and adults used different parts of their brains to process what they were feeling. The teens mostly used the amygdala, a small almond shaped region that guides instinctual or "gut" reactions, while the adults relied on the frontal cortex, which governs reason and planning.

As the teens got older, the center of activity shifted more toward the frontal cortex and away from the cruder response of the amygdala.

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Yurgelun-Todd, director of neuropsychology and cognitive neuroimaging at McLean Hospital believes the study goes partway to understanding why the teenage years seem so emotionally turbulent. The teens seemed not only to be misreading the feelings on the adult's face, but they reacted strongly from an area deep inside the brain. The frontal cortex helped the adults distinguish fear from shock or surprise. Often called the executive or CEO of the brain, the frontal cortex gives adults the ability to distinguish a subtlety of expression: "Was this really fear or was it surprise or shock?" For the teens, this area wasn't fully operating.



Reactions, rather than rational thought, come more from the amygdala, a primitive, (reactionary area deep in the brain) than the frontal cortex, which led Yurgelun-Todd and other neuroscientists to suggest that an immature brain leads to impulsivity, or what researchers dub "risk-taking behavior." Although it was known from animal studies and brain-injured people that the frontal cortex matures more slowly than other brain structures, it has only been with the advent of functional MRI that researchers have been able to study brain activity in normal children.

The brain scans used in these studies are a valuable tool for researchers. Never before have scientists been able to develop data banks of normal, healthy children.

These discoveries have led to huge strides in medicine, from pinpointing the timing at which children should be operated on for vision problems to shedding light on the mechanisms that cause such diseases as schizophrenia. Much of the early focus of the research was on the early years of development or on diseased brains. Now, with the advent of new imaging techniques, researchers are able to examine normal brains and brains of people throughout their lives.

Before the advent of magnetic resonance imaging (MRI), scientists already knew a lot about how the brain functioned. When people suffered brain damage or injury to particular parts of the brain, scientists could see what functions were impaired, and infer that the injured areas governed those functions. For example, people who had strokes in the area of the brain affecting speech lost the ability to speak. Autopsies showed when particular parts of the brain matured, the connections were wrapped in white matter, or myelin.

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With functional MRIs, researchers can see how the brain actually functions -- what parts of the brain use energy when performing certain tasks. They know, for instance, the particular part of the brain that "lights up" when performing a visual task. Those images in which brain activity is measured are called "functional" because they measure how the brain performs tasks rather than simply mapping out the structure of the brain.

FRONTLINE's "Inside the Teenage Brain" focuses on work done by [Dr. Jay Giedd](#) at the National Institute of Mental Health in Bethesda, Md., together with colleagues at McGill University in Montreal. In a particularly interesting study, Dr. Giedd looked at the brains of 145 normal children by scanning them at two-year intervals. This was work Giedd was only able to do with magnetic resonance imaging, because it requires neither harmful dyes nor radiation, making the study of normal children, as opposed to sick ones, ethically tenable.

What the researchers have found has shed light on how the brain grows and when it grows. It was thought at one time that the foundation of the brain's architecture was laid down by the time a child is five or six. Indeed, 95 percent of the structure of the brain has been formed by then. But these researchers have discovered changes in the structure of the brain that appear relatively late in child development.

## Changes in the Frontal Cortex

Giedd and his colleagues found that in an area of the brain called the frontal cortex, the brain appeared to be growing again just before puberty. The frontal cortex sits just behind the forehead. It is particularly interesting to scientists because it acts as the CEO of the brain, controlling planning, working memory, organization, and modulating mood. As the frontal cortex matures, teenagers can reason better, develop more control over impulses and make judgments better. In fact, this part of the brain has been dubbed "the area of sober second thought."

The fact that this area was still growing surprised the scientists. Although they knew that the brain of a baby grew by over-producing synapses, or connections, they had not known that there was a second period of over-production. In a baby, the brain over-produces brain cells (neurons) and connections between brain cells (synapses) and then starts pruning them back around the age of three. The process is much like the pruning of a tree. By cutting back weak branches, others flourish. The second wave of synapse formation described by Giedd showed a spurt of growth in the frontal cortex just before puberty (age 11 in girls, 12 in boys) and then a pruning back in adolescence.

Even though it may seem that having a lot of synapses is a particularly good thing, the brain actually consolidates learning by pruning away synapses and wrapping white matter (myelin) around other connections to stabilize and strengthen them. The period of pruning, in which the brain actually loses gray matter, is as important for brain development as is the period of growth. For instance, even though the brain of a teenager between 13 and 18 is maturing, they are losing 1 percent of their gray matter every year.

Giedd hypothesizes that the growth in gray matter followed by the pruning of connections is a particularly important stage of brain development in which what teens do or do not do can affect them for the rest of their lives. He calls this the "use it or lose it principle," and tells FRONTLINE,

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"If a teen is doing music or sports or academics, those are the cells and connections that will be hardwired. If they're lying on the couch or playing video games or MTV, those are the cells and connections that are going to survive."

## Corpus Callosum and Cerebellum

In another study of growth patterns of the developing brain, Paul Thompson of the University of California at Los Angeles, along with Jay Giedd and colleagues from McGill University, found waves of growth in the corpus callosum, a fiber system that relays information between the hemispheres of the brain. Of particular interest to educators and parents is their finding that the fiber systems influencing language learning and associative thinking grew more rapidly than surrounding regions before and during puberty (a similar period to the growth of the frontal cortex), but fell off shortly after. These findings reinforce studies on language acquisition that show that the ability to learn new languages declines after the age of 12. [\[1\]](#)



These studies of the corpus callosum are part of a large multi-centered research study on twins. Researchers are hopeful that twin studies will also shed light on the age-old question of nature or nurture -- which traits and characteristics are due to genetics and which can be affected by the environment. For instance, the studies have shown that the corpus callosi of twins are so similar that one can put 10 twin brain MRIs on view and even a novice can spot the pairs. The researchers therefore hypothesize that this part of the brain is largely controlled by genes. However, another piece of neuroanatomy, the cerebellum, at the back of the head just above the neck, is not very similar in twins, leading Giedd to hypothesize that the cerebellum is not genetically controlled and is thus susceptible to the environment.

Interestingly, the cerebellum is a part of the brain that changes well into adolescence. Scientists think the cerebellum helps in physical coordination. But looking at functional imaging studies of the brain, researchers also see activity in the cerebellum when the brain is processing mental tasks. Giedd thinks it works like this: "It's like a math co-processor. It's not essential for any activity ... but it makes any activity better. Anything we can think of as higher thought, mathematics, music, philosophy, decision-making, social skill, draws upon the cerebellum. ... To navigate the complicated social life of the teen and to get through these things instead of lurching seems to be a function of the cerebellum."

## Cautionary Words

Jay Giedd and his colleagues have given us a new window into understanding how the pre-adolescent brain develops. It confirms what other neuroscientists have outlined over the past 25

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years -- that different parts of the brain mature at different times. In particular, it corroborates the work of neuroscientists like Peter Huttenlocher who have shown that the frontal cortex of human beings matures relatively late in a child's life.

However, knowing more about the *structure* of the brain does not necessarily tell us more about the *function* of the brain. It is a good hypothesis that if a particular structure is still immature, the functions it governs will show immaturity. Thus, there is fairly widespread agreement that adolescents take more risks at least partly because they have an immature frontal cortex, because this is the area of the brain that takes a second look at something and reasons about a particular behavior. However, moving from structure to function, deciding what *behavior* is caused by what part of the brain is much more complicated.

[Jack Shonkoff](#), professor of child development at Brandeis University and author of [\*From Neurons to Neighborhoods\*](#), warns policymakers to be careful about interpreting the findings of neuroscientists too simplistically. In his interview with FRONTLINE, Shonkoff says, "The caution is really to be careful about what's not quite ready for prime time yet in terms of application."

[John Bruer](#), the author of *The Myth of the First Three Years* and the president of the James S. McDonnell Foundation, is more blunt. Says Bruer: "This simple, popular, newsweekly-magazine idea that adolescents are difficult because their frontal lobes aren't mature is one we should be very cautious of. Yes, there are adolescents that are hard to get along with. There are adults that are hard to get along with for the same reason. Presumably, the adults have mature frontal areas. There are very young children who seem to have no problem with this. Very immature brain structure, yet results in very sophisticated behavior. So this notion there's going to be some easy connection between counting synapses or measuring white matter and the kinds of behaviors people display or we want them to display is one we're going to have to do a lot more work on before it's science."

Despite the caveats about how much we can know about brain function and how readily any of this work can be translated into policy, it is clear from the research that the brain is a good deal more plastic or changeable than we once thought. Important structural changes are taking place well into adolescence and beyond. Except for a few well-defined [sensitive periods](#) for certain types of vision, hearing, and first-language learning, the brain is capable of growth well beyond the first few years of life. An important part of the growth is happening just before puberty and well into adolescence. The brain research adds new dimensions to our understanding of adolescence -- a time of both heightened opportunity and risk.

The good news emerging from recent work on the teenage brain is that it reinforces the notion that the brain is flexible and plastic, often able to catch up when deficiencies in early childhood are redressed later on. This is an important concept because it affects how we look at the ways children learn and, in particular, whether certain stages of a child's life are more important than others. Most experts who study children -- the way their brains work and the way they learn -- now agree that while the first years of a child's life are an important stage of brain development and learning, there are only a few critical times when children *must* be exposed to certain stimuli without which they will miss crucial developmental steps.

## Some Critical Periods for a Young Child

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Research suggests that there are certain critical developmental periods for particular functions, such as vision and hearing. William Greenough, James Black, and Christopher Wallace at the University of Illinois did most of their work on rats, but their concept of how the brain learns from experience is widely believed to apply to humans as well.

The researchers distinguish between two different mechanisms guiding brain development. One is called "experience-expectant." For instance, the brain "expects" certain visual images, patterns, and exposure to light in order for vision to develop normally. The developing neural system expects to hear sound in order for the auditory system to develop properly.

For certain functions, neurologists have found a critical period of time at which a child must have sensory or motor input. If a particular stimuli is not present at that time in early development, the window closes and the opportunity is lost forever. In a famous experiment, two scientists, David Hubel and Torsten Wiesel, illustrated that a kitten, temporarily blinded in one eye at a crucial developmental period, would never recover its sight in that eye even when the blindfold was taken off. It would not develop what is called binocular vision. In Greenough's framework, these "expected" experiences help shape and wire the basic neural systems, in particular those involving sight, hearing, and to some extent, movement.

The other mechanism guiding brain development is called "experience-dependent" and refers to experiences that are unique not to the species, but to the individual. Thus a child born in an igloo to Inuit parents will begin to learn about dog teams and skinning animals while a small child in Illinois might be experimenting with pots and pans, or puzzles, or picking out notes on a piano. The brain develops synapses, or connections, specific to what is being learned by the individual. Things that are specifically learned appear to be dependent on the particular environment of the child, whereas certain types of other experience -- spoken language, visual and auditory stimuli, motor input, something that the brain "expects" to find in any environment into which a child is born -- is not.

## Most Learning Takes Place Throughout Our Lives

Most human learning is not dependent on sensitive or critical periods or on lessons being taught at a particular age. Unlike the development of the visual system, in which it is crucial for babies to see patterns and light from both eyes when they are infants, many things can be taught to children outside of the early years. There appears to be no particular benefit, for instance, to teaching music or number sense to toddlers, despite claims to the contrary. This is true even for reading. Children are taught to read at greatly varying ages in different countries, and yet the literacy of children who began reading relatively late sometimes is *greater* than those who learned to read much younger.

Acquiring spoken language is slightly more complicated, and there has been a large amount of work done in this area since it is so crucial for a child's performance at school. Experts used to think that there were critical periods for learning a first language, and mothers were taught to enunciate very clearly to their babies. However, we now learn that the kind of baby talk once so frowned upon is exactly what babies need in order to learn the language.

For language development as a whole, it appears that the critical period is much longer than it is for sight. For a child's native language, both grammar and accent appear to be best learned young, and the window does seem to close, slowly, around puberty. This is true of second-language learning,

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too. As Harry Chugani of Wayne State University in Detroit put it: "Who's the idiot who decided that youngsters should learn foreign languages in high school?" But the same is not true of vocabulary, or the semantics of language. Here again the brain shows flexibility, taking in new words and constructions well beyond childhood.

Some of the early research into how children come to know certain things -- i.e., into children's cognitive development -- emerged out of work on environmental complexity or "enriched environments" originally with rats, but also with monkeys. Researchers put the animals in three different kinds of cages. For instance, individual rats were isolated in a small lab cage; others inhabited larger cages with other rats; still others were put in complex environments, not only living with other rats, but given lots of toys and obstacles that were changed regularly so the rats weren't bored.

The rats who had the more complex cages seemed to produce more synapses. They could find their way through more complicated mazes than other rats and more quickly. In short, they appeared to be smarter. Their brains seemed to be bigger, too. In one study, the rats raised in complex cages appeared to have 25 percent more synapses in certain parts of their brains compared to the more deprived rats.

This research excited the community of neuroscientists and made its way into the popular press. Combined with a popularization of the idea of critical periods in an infant's life, the enriched-environments research appeared to argue for the benefits of stimulation for infants and toddlers. Legislators called for an Early Head Start program in 1995, arguing that the disappointing results of the program for children ages 3 to 5 were due to the fact that it started too late, after much crucial brain development had taken place. Movie director Rob Reiner, a charismatic advocate for children, picked up this theme, launching a national campaign called "I Am Your Child." Speaking to the National Governor's Association in February 1997, Reiner stated: "We now know through science that the first three years of life is the most critical time period. It is the time period when the brain develops at a greater rate than any time during the course of a person's life. ... But by age 10 your brain is cooked and there's nothing much you can do."

Parents bought mobiles, flash cards. The governors of Georgia and Missouri gave mothers of newborns classical music tapes and CDs because research seemed to indicate music would make babies smarter. And while this fervent interest in the brain development of little children swept through the nation, neuroscientists and others began to set the record straight about what neuroscience really had to say about enriched environments and critical periods.

Cautioning against using monkey and rat research, Dr. William Greenough argued that the "rich" environment for a rat is actually the normal environment for a child. Infants are never raised completely alone and they often have much to explore right at home -- just crawling around the floor might bring a baby to table legs, books to be pulled out of bookshelves, clothes hampers to be upended. His research, stated Greenough, did not argue for extra stimulation. There was no research at all indicating that those mobiles, flash cards, and music lessons created more synapses in a baby's brain.

What we learn about brain science and how children learn about the world around them should give solace to many parents who worry that they have missed giving their children crucial experiences in

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the early years. Much of what we learn happens throughout our lives. What we missed at one stage, given different circumstances, can be made up later on. The work of neuroscientists and of educators points to the resilience of the brain, to a lifelong ability to learn new things. Public policy that supports learning and interventions at all stages of a child's life can have a profound effect on our society.

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## Sarah Spinks' Interview With Dr. Jay Giedd

### What has surprised you about looking at the adolescent brain?

The most surprising thing has been how much the teen brain is changing. By age six, the brain is already 95 percent of its adult size. But the gray matter, or thinking part of the brain, continues to thicken throughout childhood as the brain cells get extra connections, much like a tree growing extra branches, twigs and roots. In the frontal part of the brain, the part of the brain involved in judgment, organization, planning, strategizing -- those very skills that teens get better and better at -- this process of thickening of the gray matter peaks at about age 11 in girls and age 12 in boys, roughly about the same time as puberty.



After that peak, the gray matter thins as the excess connections are eliminated or pruned. So much of our research is focusing on trying to understand what influences or guides the building-up stage when the gray matter is growing extra branches and connections and what guides the thinning or pruning phase when the excess connections are eliminated.

### And what do you think this might mean, this exuberant growth of those early adolescent years?

I think the exuberant growth during the pre-puberty years gives the brain enormous potential. The capacity to be skilled in many different areas is building up during those times. What the influences are of parenting or teachers, society, nutrition, bacterial and viral infections -- all these factors -- on this building-up phase, we're just beginning to try to understand. But the pruning-down phase is perhaps even more interesting, because our leading hypothesis for that is the "Use it or lose it" principle. Those cells and connections that are used will survive and flourish. Those cells and connections that are not used will wither and die.

So if a teen is doing music or sports or academics, those are the cells and connections that will be hard-wired. If they're lying on the couch or playing video games or MTV, those are the cells and connections that are going [to] survive.

The frontal lobe is often called the CEO, or the executive of the brain. It's involved in things like planning and strategizing and organizing, initiating attention and stopping and starting and shifting attention. It's a part of the brain that most separates man from beast, if you will. That is the part of

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the brain that has changed most in our human evolution, and a part of the brain that allows us to conduct philosophy and to think about thinking and to think about our place in the universe. ...

I think that [in the teen years, this] part of the brain that is helping organization, planning and strategizing is not done being built yet ... [It's] not that the teens are stupid or incapable of [things]. It's sort of unfair to expect them to have adult levels of organizational skills or decision making before their brain is finished being built. ...

It's also a particularly cruel irony of nature, I think, that right at this time when the brain is most vulnerable is also the time when teens are most likely to experiment with drugs or alcohol. Sometimes when I'm working with teens, I actually show them these brain development curves, how they peak at puberty and then prune down and try to reason with them that if they're doing drugs or alcohol that evening, it may not just be affecting their brains for that night or even for that weekend, but for the next 80 years of their life. ...

## **Tell me a little bit about how the brain develops.**

How does the brain -- arguably the most complicated three-pound mass of matter in the known universe -- how does the brain become the brain? It does so through two simple but powerful processes.

The first one is over-production. The brain produces way more cells and connections than can possibly survive. There's only so many nutrients, there's only so many growth factors, there's only so much room in the skull. After this vast over-production, there is a fierce, competitive elimination, in which the brain cells and connections fight it out for survival. Only a small percentage of the cells and connections make it.

This is a process that we knew happened in the womb, maybe even the first 18 months of life. But it was only when we started following the same children by scanning their brains at two-year intervals that we detected a second wave of over-production. This second wave of over-production is manifest by an actual thickening in the gray matter, or the thinking part, in the front part of the brain.

As this second wave of over-production is occurring, it prepares the adolescent brain for the challenges of entering the next stage of life, the adult years. There's enormous potential at that time. People can take many different life directions. But about around that time of puberty, people start specializing, so to speak. They start deciding, "This is what I'm going to be good at, whether it be sports or academics or art or music." All the life choices, even though they are still there, start getting whittled away, and we have to start sort of focusing in on what makes us unique and special. ...

## **Do you have particular concerns about that period, too, though?**

Yes. It's a time of enormous opportunity and of enormous risk. And how the teens spend their time seems to be particularly crucial. If the "Lose it or use it" principle holds true, then the activities of the teen may help guide the hard-wiring, actual physical connections in their brain. ...

# Child Hypnosis

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## **Can you describe to me what people used to believe about the brain, actually, very recently?**

One of the most exciting discoveries from recent neuroscience research is how incredibly plastic the human brain is. For a long time, we used to think that the brain, because it's already 95 percent of adult size by age six, things were largely set in place early in life. ... There was the saying. "Give me your child, and by the age of five, I can make him a priest or a thief or a scholar."

There was this notion that things were largely set at fairly early ages. And now we realize that isn't true; that even throughout childhood and even the teen years, there's enormous capacity for change. We think that this capacity for change is very empowering for teens. ...

This is an area of neuroscience that's receiving a great deal of attention ... the forces that can guide this plasticity. How do we optimize the brain's ability to learn? Are schools doing a good job? Are we as parents doing a good job? And the challenge now is to ... bridging the gap between neuroscience and practical advice for parents, teachers and society. We're not there yet, but we're closer than ever, and it's really an exciting time in neuroscience. ... The next step will be, what can you do about it, what can we do to help people? What can we do to help the teen optimize the development of their own brain? ...

## **There has been a great deal of attention on the early years, and particularly on stimulating the early brain. What do you think of that work and that popularization of that brain science?**

There's been a great deal of emphasis in the 1990s on the [critical importance of the first three years](#). I certainly applaud those efforts. But what happens sometimes when an area is emphasized so much, is other areas are forgotten. And even though the first 3 years are important, so are the next 16. And the ages between 3 and 16, there's still enormous dynamic activity happening in brain biology. I think that that might have been somewhat overlooked with the emphasis on the early years. ...

## **Not so long ago, people were emphasizing teaching little children through flashcards, through particular kinds of mobiles with black-and-white checks on them, playing Mozart. In fact, some states have sent CDs back with new mothers. What do you think of that? Has that been a misinterpretation of brain science?**

... We all want to do the best for our children. And what I fear is happening is that we're leaping too far from the neuroscience to such things. I don't think there is any established videotape or CD or computer program or type of music to play that we've shown with any scientific backing to actually help our children.

The more technical and more advanced the science becomes, often the more it leads us back to some very basic tenets of spending loving, quality time with our children. The brain is largely wired for social interaction and for bonding with caretakers. And sometimes it's even disappointing to people that, with all the science and all the advances the best advice we can give is things that our grandmother could have told us generations ago: to spend loving, quality time with our children. ... I think [it] probably does more harm than good for parents to be confronted with so many of these conflicting reports in the media without any scientific basis. ...

# Child Hypnosis

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## What directions is the research taking to explore how we can optimize brain development?

Now that we've been able to detect the developmental path of different parts of the brain, the next phase of our research is to try to understand what influences these brain development paths. Is it nutrient or parenting or video games or the activity of the [child]? Or is it genes? By studying twins, we can begin to address some of these very basic nature/nurture-type of questions.

For instance, when twins are in the first grade, their parents often dress them in the same clothes. They get the same haircut. It's sort of cute how alike they are. But that's not as cool in high school anymore. And so a lot of the twins as teens in high school start doing different things. The one who was a little bit better in sports may become an athlete. The one who was a little bit better at academics may become a scholar. Or one may turn to music and one to art. But they often have different daily activities.

So we can scan the brains when the twins are young and doing everything very much alike; then we can scan them as teenagers, when they start having different daily activities. This gives us a sense of which parts of the brain are influenced by behavior and which parts by the genes themselves.

We've already got some interesting early data on this. One part of the brain is called the corpus callosum. It's a thick cable of nerves that connects that two halves of the brain and is involved in creativity and higher type of thinking. It's very popular for imaging studies because it leaps out of the picture. It's very easy to measure and quantify.

It's also interesting because it changes a lot throughout childhood and adolescence. It's been reported to be different in size and shape in many different illnesses that happen during childhood ... many higher cognitive thought [processes] like creativity and ability to solve problems. So it's been of great interest, especially to child psychiatrists. And what we find is that the size and shape of the corpus callosum is remarkably similar amongst twins ... and [so] seems to be surprisingly under the control of the genes.

But another part of the brain -- the cerebellum, in the back of the brain -- is not very genetically controlled. Identical twins' cerebellum are no more alike than non-identical twins. So we think this part of the brain is very susceptible to the environment. And interestingly, it's a part of the brain that changes most during the teen years. This part of the brain has not finished growing well into the early 20s, even. The cerebellum used to be thought to be involved in the coordination of our muscles. So if your cerebellum is working well, you were graceful, a good dancer, a good athlete.

But we now know it's also involved in coordination of our cognitive processes, our thinking processes. Just like one can be physically clumsy, one can be kind of mentally clumsy. And this ability to smooth out all the different intellectual processes to navigate the complicated social life of the teen and to get through these things smoothly and gracefully instead of lurching ... seems to be a function of the cerebellum.

And so we think it's intriguing that we see all these dynamic changes in the cerebellum taking place during the teen years, along with the changes in the behaviors that the cerebellum sub-serves.

## What would influence the development of the cerebellum?

# Child Hypnosis

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Traditionally it was thought that physical activity would most influence the cerebellum, and that's still one of the leading thoughts. It actually raises thoughts about, as a society, we're less active than we ever have been in the history of humanity. We're good with our thumbs and video games and such. But as far as actual physical activity, running, jumping, playing, children are doing less and less of that, and we wonder, long term, whether that may have an effect on the development of the cerebellum.

The recess and play seems to be the first thing that is cut out of school curriculums in tight times. But those actually may be as important, or maybe even more important, than some of the academic subjects that the children are doing. ... We think that the "Use it or lose it" principle holds for the cerebellum as well. If the cerebellum is exercised and used, both for physical activity but also for cognitive activities, that it will enhance its development.

... One analogy that computer people use is that [the cerebellum is] like a math co-processor. It's not essential for any activity. People can get by quite well without large chunks of it. But it makes many activities better. The more complicated the activity, the more we call upon the cerebellum to help us solve the problem. And so almost anything that one can think of as higher thought -- mathematics, music, philosophy, decision making, social skills -- seems to draw upon the cerebellum. ...

The relationship between the findings that we have in the cerebellum and sort of practical advice or the links between behavior are not well worked out yet. That's going to be one of the great challenges of neuroscience -- to go from these neuroscience facts to useful information for parents, for teachers or for society. But it's just so recently that we've been able to capture the cerebellum that no work has yet been done on the forces that will shape the cerebellum or the link between the cerebellum shape or size and function.

## **When you look at the recent work that you've done in terms of the frontal cortex, do you see a difference between girls and boys?**

Yes. One of the things that we're particularly interested in as child psychiatrists is the difference between boys' brains and girls' brains, because nearly everything that we look at as child psychiatrists is different between boys and girls -- different ages of onset, different symptoms, different prevalences and outcomes. Almost everything in childhood is more common in boys -- autism, dyslexia, learning disabilities, ADHD, Tourette's syndrome -- are all more common in boys. Only anorexia nervosa is more common in girls. So we wonder if the differences between boys' and girls' brains might help explain some of these clinical differences.

The male brain is about 10 percent larger than the female brain across all the stages of ... 3 to 20; not to imply that the increased size implies any sort of advantage, because it doesn't. The IQs are very similar. But there are differences between the boy and girl brains, both in the size of certain structures and in their developmental path. The basal ganglia, which are a part of the brain that help the frontal lobe do executive functioning, are larger in females, and this is a part of the brain that is often smaller in the childhood illnesses. I mentioned, such as ADD and Tourette's syndrome.

So girls, by virtue of having larger basal ganglia, may be afforded some protection against these illnesses. But in the general trend for brain maturation, it's that girls' brains mature earlier than boys' brains. ...

# Child Hypnosis

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## **What if we want to help our child become more confident and less stressed?**

Hypnosis is a good tool to strengthen your child's confidence in using natural gifts and talents. Simple techniques can be taught so that your child learns ways to help herself in school or performance or competition. Using these tools can make childhood an easier place for your son or daughter.