Help! My Grandchildren are Driving Me Crazy! (are kids today just naughty kids?)

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The Story of Fidgety Philip

by Heinrich Hoffmann





The Story of Johnny Look-in-the-Air

by Heinrich Hoffmann





Ricky

- Ricky is a 16 year old who lives with his mother and his 12 year old brother. Ricky has currently dropped out of high school. He is a smart young man who can build and take things apart. He is street savvy. He has always had difficulty however with reading. Ricky is currently a leader in a local gang.
- Ricky's parents divorced when Ricky was 6 years old. His mother never remarried but did have a couple of live-in partners. Ricky has witnessed domestic violence between his mother and one her boyfriends when the boyfriend would drink too much. Mother loves her children and tried her best to raise them as a single mother. However, she has a history of dropping out of school after the 10th grade. She did get her cosmetology license and was a successful hairdresser for many years until the children were born. She stayed at home to care for the children. After the divorce she was never able to organize her life well. She fell in love with a man who introduced her to cocaine and alcohol. While the relationship did not last, she continued to drink excessively at times. Ricky's father remarried and has a stable job. After many conflictual encounters, he has distanced⁴ himself from his ex-wife and the children.



Tom

- Tom is a 16 year old who lives with his mother. He is an only child. His parents divorced when he was 7 years old. He has regular contact with both parents who share custody. Tom attends a private school. He is very bright. He was retained in Kindergarten due to social immaturity but has done well in school since then. He is a member of the football team. His parents do complain that he needs to be reminded of his responsibilities and is quite disorganized. Tom would like to attend college. His parents help to organize his extra curricular activities so that he will have all he needs when it comes time to apply for college.
- Both parents have a college education. Tom's mother is an executive for a local company and is a regular volunteer in town. His father has a history of changing jobs every few years. He currently works in a support position at the local university. Mother never remarried. Father remarried but did not have any other 5 children.



History of Attention Deficit Hyperactive Disorder

- Encephalitis Lethargica (sequelae thereof)
- Minimal Brain Damage
- Minimal Cerebral Palsy
- Mild Retardatio,
- Minimal Brain Dysfunction
- Hyperkinesis
- Attention Deficit Disorder (ADD)
- Attention Deficit Hyperactivity Disorder (ADHD)



20th century

These symptoms have included, but are certainly not limited to:

- poor performance in school,
- extreme extroversion,
- outbursts of violent behavior,
- inability to "stay on task,"
- ✓ thievery,
- disturbances in sleep patterns,
- morality inconsistent with age,
- ✓ forgetfulness.



What is ADHD?

- Developmental disorder of self control
- Problems with:
 - Attention span
 - Impulse control
 - Activity level
 - Executive functioning





ADHD is not a normal stage

- Not a temporary stage what will be outgrown
- Not caused by failure to discipline or control the child
- Not a sign of some inherent "badness" in the child





Factors to consider when labeling ADHD a real developmental disorder

- 1. Arises early in childhood
- 2. Pervasive occurs across situations
- 3. Affects the child's ability to function successfully in meeting the typical demands placed on a child of that age
- 4. Persistent over time
- Not accounted for by purely environmental causes or social causes
- 6. Related to abnormalities in brain functioning / development
- Associated with other biological factors that can affect brain functioning (e.g. toxins, injuries, genetics)



Are there changes in the brains of People with ADHD?

Biochemical changes

Structural changes

Are there changes in the brains of People with ADHD





Biochemical changes

Dopamine

Dopamine







The Synapse: Contact between Nerve Cells



Dopamine molecules are decreased in ADHD





The ADHD Brain

Are there changes in the brains of People with ADHD?

Structural changes

The ADHD Brain



Decrease in the volume of

- Cerebral cortex
- Striatum
- Cerebellum



The ADHD Brain

Are there changes in the brains of People with ADHD?

Biochemical changes - Dopamine

Structural changes – Some brain regions are smaller



Ricky & Tom: Infancy & Toddler years

Ricky:

- Full-term; C-section birth after 22 hours of labor
- 10 1/2 lbs
- Difficult to calm down
- Slow to talk; early walker
- From crawling to running in a short period

- Full-term, natural vaginal delivery
- 8 lbs big eater
- Motor and language development on time



Ricky & Tom: The Preschool Years

Ricky:

- Very active more so than others of his age.
- Ignores parents' directives.
- Understands language fine but he is difficult to understand. By age 3, speech is still garbled
- Parents appear exhausted and get frustrated easily by his temperament

- Gets bored easily
- Is irritated by other children and often chooses to stop playing early
- Plays rough with others
- Parents think he just acts like a little boy
- Good language development



A visit to the pediatrician... age 5 school readiness

Ricky:

- Mother notes concerns that Ricky appears to be more active than other children. She has to keep eyes on him all the time and he has doesn't follow her directions.
- Referred to speech therapist- he is difficult to understand.

- After repeated ear infections and frequent coughs with difficulty breathing, diagnosed with asthma.
- Parents have no other concerns.

Brain Development

A very long process: starts before birth and continues throughout life

- Neurogenesis: Production of brain cells, occurs mostly before birth
- Neuronal migration: Brain cells find their correct location, before and after birth
- Synapse formation: Brain cells make connections, after birth and throughout life

Brain Development

Vision

Babies can see at birth, clearly and with discrimination, especially objects (like human faces) eight to 10 inches away.

The development of depth perception and hand-eye coordination take more time.

Visual acuity develops from birth to about age 6 or 7; binocular vision develops between ages 1 and 3.



Brain Development

Emotion

Some of the first circuits the brain builds are those that govern the emotions. The first two emotions are opposites: feeling calm and relaxed and feeling distress and tension. Beginning around two months of age, these start to evolve into more complex feelings.

The stress response develops immediately, from birth through age 3; empathy and envy begin to develop during the second year through about age 10.



Brain Development

Language

Before birth, an infant learns the "melody" of its mother's voice. During the first six years, its brain will set up the circuitry needed to understand and reproduce complex language. Language skills grow throughout life. Recognition of speech begins at birth through ages 6 or 7; vocabulary starts growing during the second year and continues through adulthood.



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mom	dad	sister	brother
R S grandma	grandpa	aunt	Market State
A A happy	l love you	book	bear
hurt	bed	dog	and
R R eat	An An drink	R R milk	water
원용		A A	A A A

Brain Development

Motor Skill

Motor-skill development starts with the larger muscles (like the neck, arms and legs) and moves to increasingly smaller muscles (like fingers and toes). Basic motor skills start developing shortly after birth; fine motor ability begins developing in the second half of the first year. Musical fingering ability opens up about age 5.



Brain Development

Brain Development: Facts and Myths

1. At birth the brain is fully developed, just like one's heart or stomach

Brain Development

Brain Development: Facts and Myths

1. At birth the brain is fully developed, just like one's tor stomach

Most of the brain's cells are formed before birth, but the connections among cells develop during infancy, childhood and even during the teenage years

Brain Development

Brain Development: Facts and Myths

2. Brain development depends entirely on the genes with which you are born

Brain Development

Brain Development: Facts and Myths

2. Brain development depends entirely on the genes with which ou are born

Early experience and interaction with the environment are most critical in a child's brain development

Brain Development

Brain Development: Facts and Myths

3. A toddler's brain is less active than the brain of a college student

Brain Development

Brain Development: Facts and Myths

3. A toddler's brain is less active than the brain of a crocker student

A 3-year-old's brain is twice as active as an adult's brain

Brain Development

Brain Development: Facts and Myths

4. Talking to a baby is not important because babies can't understand what you are saying

Brain Development

Brain Development: Facts and Myths

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Talking to young children establishes foundations for communication during early critical periods when learning is easiest for a child

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Brain Development

Brain Development: Facts and Myths

5. Children need special help and specific educational toys to develop their brainpower

Brain Development

Brain Development: Facts and Myths

5. Children need special help and specific educational to develop their brainpower

Talking, singing, playing and reading are some of the key activities that build a child's brain



ADHD and Brain Development





ADHD and Brain Development



Children (15 year old) with ADHD show altered brain conectivity



ADHD and Brain Development



Children with ADHD show delayed brain development







ADHD and Brain Development

- 1. Brain development is a long, protracted process beginning at birth and continuing throughout life
- 2. Growing brains are very responsive to external inputs
- 3. Brains of children with ADHD show structural and functional changes beginning early in childhood

What do children need to be successful in school?

- □ Attention, persistence, & goal directedness
- Ability to focus
- Selective attention
- Lengthen of task persistence
- Delay gratification
- Inhibit impulsive behavior
- Planning: organize actions and follow through





What do children need for appropriate social development?

- □ Share
- Interact pleasantly



- Learn to balance cooperation & competition important for participation in sports, music, dance, etc.
- Sublimate immediate desire in interest of long-term friendships
- Exhibit some independence in adaptive behavior dressing, doing chores, etc.



Importance of social relationships during childhood

Ability to form positive social relations is one of the top predictors of adult mental health

- Children who are bossy, aggressive , disruptive →rejection by peers
- Children who are helpful, cooperative, attractive →popular
- Perceptions don't change easily. Even when child learns better social skills, it takes peers a long time to accept / recognize the change



Ricky & Tom in elementary school

Ricky:

- Difficulty sitting still in class
- Difficulty learning to read but math skills are fine
- Oppositional both at home and school

- Socially immature teacher recommends an extra year of Kindergarten
- Academically doing well
- Distracted; doesn't follow through



Both teachers recommend to the parents that Ricky (2nd grade) and Tom (3rd grade) be evaluated

- □ What should the parents do?
 - Ricky's parents think he is just a brat and "don't believe" in psychologists.
 - Think perhaps a medication to make him less "hyper" can solve the problem.
 - Tom's parents are surprised. They have always viewed their child as very smart. They believe that is why he is bored and why he doesn't stick to an activity for long.



Assessment of children for ADHD

- Family medical history
- School / teacher information
- Parent information (checklists)
- Psycho-educational evaluation
- Child interview / observation
- For a diagnosis of ADHD, data is needed from several sources.



Diagnosis: ADHD...now what?

- Both were recommended for medication and psychotherapy.
- **Psychotherapy** includes:
 - Parent management training
 - Social skills training





- Psycho-education about ADHD
- Cognitive technique to help learn how to STOP-LOOK-LISTEN
- Behavioral consultation with the school
- Possible educational interventions
- Summer programs



How do ADHD medications work?

Stimulants are effective in the treatment of ADHD

The most frequently used stimulants are:

Methylphenidate

and

Amphetamine





How do ADHD medications work?

Methylphenidate was first synthesized at CIBA (now Novartis) in 1944 and identified as a stimulant in 1954



Leandro Panizzon



How do ADHD medications work?



When taken at the appropriate dose and via the appropriate route (usually oral):

Methylphenidate and Amphetamine increase dopamine in the frontal cortex



How do ADHD medications work?





How do ADHD medications work?





Ricky in High School

- Dropped out in 10th grade
- Poor home situation
- Joined gang
- 1st admission at age 16 to a residential facility
- Marijuana, experimentation with "crack" cocaine
- Teen father
- Several stays at juvenile detention
- No treatment



Tom in high school

- Graduated from a private school with honors
- Played on the football team
- Socially immature friends a mix of other ADHD boys and some immature girls
- Experimented with marijuana and alcohol
- Bouts of mild depression
- Socially active in school functions
- Accepted to college



Stimulants and addiction

Extensive research and many years of clinical experience show that stimulants are safe, effective and invaluable for treating ADHD

However, there is concern among parents, patients and clinicians that stimulant medications can be abused or that long-term treatment Can lead to dependence or drug abuse problems

Stimulants and addiction







Ritalin (Methylphenidate)













Stimulants and addiction

Methylphenidate (Ritalin) and drugs of abuse such as cocaine and methamphetamine are similar in chemical structure

All of these compounds increase dopamine in the brain





Methylphenidate

Methamphetamine



So, should we be concerned?

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Stimulants and addiction

Addictive substances activate the brain dopamine <u>and</u> opioid





Stimulants and addiction

Can stimulants used in ADHD treatment activate the dopamine <u>and</u> opioid systems?





Stimulants and addiction

Can stimulants used in ADHD treatment activate the dopamine <u>and</u> opioid systems?

Only if used at very high doses (10X the therapeutic dose) And via parenteral routes (intranasal or iv)

Stimulants and addiction



Stimulants and addiction



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Stimulants and addiction

Methylphenidate or Amphetamine



Stimulants and addiction

Methylphenidate or Amphetamine



Stimulants and addiction

Methylphenidate or Amphetamine



Stimulants and addiction





Stimulants and addiction

- 1. Stimulants act by increasing dopamine signaling
- 2. In ADHD subjects, stimulants rectify the hypo-dopaminergic state
- 3. If taken at high doses stimulants can produce addiction by activating the opioid system in the brain
- 4. Pharmacological approaches may be available to render stimulants safe and abuse-free, even if taken at high doses



Importance of Family & Community Structure

What were the differences between the two families / communities that may have contributed to the outcomes?

