

# **BRAIN DEVELOPMENT**

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Stephen A. Thorne, PhD is a licensed psychologist in Austin, where he performs psychological and forensic evaluations (and also serves as a forensic consultant) in a private practice setting. Dr. Thorne graduated from the University of Texas Southwestern Medical Center in Dallas in 2001, and has been in private practice in Austin since that time. Dr. Thorne has testified in state and federal courts on topics relating to civil commitment of sex offenders, risk assessment, sexual recidivism, competency to stand trial (fitness to proceed for juveniles), criminal responsibility, sentencing, child pornography, interviewing protocols and methodology in sex abuse cases, substance abuse, mental retardation, fitness for duty, emotional/physical/sexual trauma, amenability to treatment, juvenile transfer to adult court, relocation of children, parental alienation, parent-child relationships and attachment, and child custody. Dr. Thorne has co-authored journal article and book chapters addressing various forensic topics, and has taught graduate courses in the areas of psychological assessment and group therapy. Dr. Thorne currently supervises doctoral psychology students at The University of Texas at Austin and he also serves as a professional reviewer for the Texas State Board of Examiners of Psychologists.

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## Adolescence Defined

“The period of physical and psychological development from the onset of puberty to maturity.”

American Heritage Dictionary, 2009

“A transitional stage of physical and mental human development that occurs between childhood and adulthood.”

Wikipedia, 2009

*biological/physical and psychological/mental maturity often do not go hand in hand...*

In Short...

10-24/25/26 y.o.

## Numbers to Consider

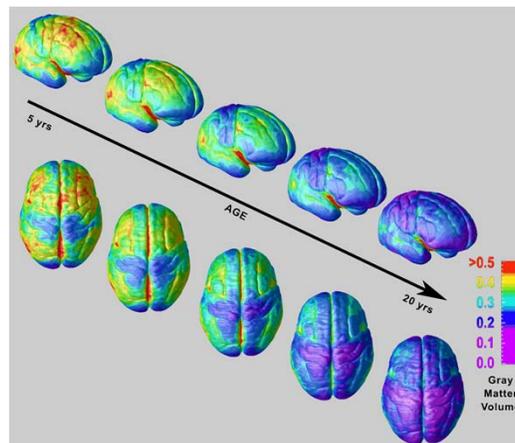
- Legal alcohol consumption age is 21 in 29 states.
- Marriageable age (absent parent/judicial consent) is 18 in 48 states.
- No one can cast a ballot or join the military until age 18.
- Children as young as 14 can be tried as an adult in 44 states.
- Nearly 250,000 juveniles are prosecuted, sentenced, and incarcerated as adults each year.

### Cognitive Development for the FINAL Stage of Adolescence (19-24)

- Ability to think ideas through from beginning to end
- Ability to delay gratification
- Examination of inner experiences
- Increased concern for future
- Continued interest in moral reasoning

American Academy of Child and Adolescent Psychiatry

### Picture Worth a Thousand Words (or a 1 Hour Talk)



NIMH/UCLA

## They Just Don't Think – Really...

Younger children and adolescents are generally less likely to think strategically about their decisions...When they find themselves in an emotionally charged situation, the parts of the brain that regulate emotions, rather than reasoning, are more likely to be engaged. As adolescents mature (this may take a while), they typically become better problem solvers, are less influenced by peers, less impulsive, and more sophisticated in the way they think.

## They Don't Think for a Reason...

The prefrontal cortex, known as the “CEO” of the brain, is responsible for executive functioning and advanced cognition (reasoning, advanced thoughts, planning, impulse control, judgment of consequences).

Prefrontal cortex is the final area of the brain to mature. Not only does the frontal lobe fail to mature until age 25 or so, but it's connections to the other parts of the brain continue to improve until that age as well.

## Prefrontal Lobe: Responsible for the Following

- Reasoning ability
- Working towards a goal
- Judgment/Decision-making
- Planning complex behavior
- Impulse control
- Emotional control
- Determining right from wrong
- Determining cause and effect relationships.
- Moderating social behavior

## But, As Luck Would Have It

Amygdala, a small part of the brain that guides instinctual/gut reactions (including fear and aggressive behavior), matures before the frontal lobe, and teenagers use the amygdala, while adults rely more on the frontal lobe (prefrontal cortex)...Young people literally have much greater activity than adults in the emotional and reactive brain regions and much less activity/maturation in the planning and inhibitory areas...So, adolescents respond with gut reactions before reasoned ones. This accounts for impulsive and risky behavior, or what many of the kids we work with describe as “courage”.

## A Mechanic's Guide

“As Steinberg sees it, a teenager's brain has a well-developed accelerator but only a partly developed brake...By around 15 or 16, the parts of the brain that arouse a teen emotionally and make him pay attention to peer pressure and the rewards of actions – the gas pedal – are probably all set. But the parts related to controlling impulses, long-term thinking, resistance to peer pressure and planning – the brake, mostly in the frontal lobes – are still developing.”

”It's not like we go from becoming an accelerator to all brake,” Steinberg said. “It's that we go from being heavy-foot-on-the-accelerator to being better able to manage the whole car.”

USA TODAY article, 12-02-07

Dr. Robert Steinberg, Temple University

## The End Result?

At some point, the majority of teenagers engage in behavior(s) that, if observed by the discerning eye of the law, would result in their arrest. As such, those adolescents who we refer to as “delinquents” are often merely those who have been caught.

## Don' t Worry – Good News!!!

Most of those same individuals do not continue their “offending” into adulthood. This, it should be noted, holds true for both violent offenders and sex offenders.

## Adolescent Development

-Increase in risk-taking, sensation-seeking, and experimentation (research suggests that our impulse control is relatively stable from time we begin school until about age 16; adolescents become more impulsive and engage in riskier behavior from ages 16 to19).

-Less likely to weigh the consequences (particularly long term) of their decisions. More likely to overlook alternative courses of action. Also more likely to focus on (and overestimate) short-term payoffs of actions.

-Increase in emotionally-driven behavior. Reactive to stress.

## Development Continued

-Increase in erratic/inconsistent behavior (*what may be true about an adolescent physically, cognitively, emotionally, or socially today may not hold true a month from now*).

-Various deficits in judgment, planning, and decision-making.

-Vulnerable to peer pressure/influence (peaks around age 14). While we all hear the “hanging out with the wrong crowd” defense/excuse, remember that biologically, juveniles are indeed more vulnerable to peer pressure.

## Influences on “Normal” Development

The human brain continues to grow and develop until our mid 20' s, at which time biological maturity is thought to be reached. However, those individuals whose childhood/adolescence is characterized by lack of focus, overstimulation, trauma, and/or substance abuse may not (even with significant intervention) reach psychological maturity until their mid-30' s or later. *The prefrontal cortex is one of the areas most strongly impacted by psychological trauma.*

Developmental research detailing “normal” growth and development is often based on normative estimates using middle-class, Caucasian adolescents. Minority youth, those living in economic hardship, or those experiencing various stressors and/or trauma may not be represented.

## Practical Influences on “Normal” Development

What a teenager invests his/her time in will literally impact their brain. Specifically, depending on the activities/tendencies of the teenager, certain neuronal connections will and won't be kept. In short, the pathways in the brain that are used will be the ones that remain. So a kid who skips school and plays video games with his/her friends all day will literally be creating very different neuronal pathways than a kid who has balance in their schedule or who is engaging in other healthier, educational, prosocial activities.

## Roper v. Simmons, 2003

U.S. Supreme Court ruling which held that 8<sup>th</sup> Amendment prevents capital punishment for individuals who committed their offense under the age of 18.

Three “general differences” between adolescents under 18 and adults:

- 1) Immaturity reflected in a tendency towards recklessness
- 2) Vulnerability to negative influences and outside pressures
- 3) The lack of a fully formed character

*Supported by a 2004 brief from The American Psychological Association which concluded that “scientific evidence shows persons under 18 lack the ability to take moral responsibility for their decisions”.*

## Adolescent or Psychopath?

- Impulsive
- Egocentric
- Prone to boredom/Need stimulation
- Irresponsible
- Failure to accept responsibility
- Lack of realistic goals
- Disregard for social norms, rules, obligations
- Promiscuous sexual behavior
- Many short-term relationships
- Limited frustration tolerance
- Lack of remorse, lack of guilt
- Poor behavioral controls

## Legal Considerations

- Fitness to Proceed
- Risk Assessment
- Criminal Responsibility
- Sex Offender Evals (Recidivism)
- General Psych and Sentencing Evals

## Brief Summary of Treatment Research (Pre-2000)

“Nothing Works”

## What works?

Multimodal, skill-oriented treatment programs delivered in home and community settings. *Hint: This is not traditional psychotherapy on the couch.*

1. The primary purpose of assessment is to understand the “fit” between the identified problems and their broader systemic context.
2. Interactions should be present-focused and action-oriented.
3. Interventions should target sequences of behavior within or between multiple systems.
4. Interventions should be developmentally appropriate and should fit the developmental needs of the youth.
5. Interventions should be designed to require daily or weekly effort by family members.
6. Intervention efficacy is evaluated continually from multiple perspectives.
7. Interventions should be designed to promote treatment generalization and long-term maintenance of therapeutic change.
8. Therapeutic contacts should emphasize the positive and should use systemic strengths as levers for change.
9. Interventions should be designed to promote responsible behavior and decrease irresponsible behavior among family members.

Henggeler et al.

## What Doesn't...

“Because adolescents are not yet mature, physiological changes can actually occur in response to the external environment...Positive environmental influences, such as close supervision, support, training and positive role models, are likely to have a more profound and positive effect on youth than adults. The opposite is also true. Harsh environments such as adult prisons do not support adolescent development...Prisons are likely to interfere with growth and development and encourage the very behavior we want to extinguish.”

Dr. Steven Berkowitz  
Yale School of Medicine Child Study Center

## Not An Excuse...

These brain differences don't mean that young people can't make good decisions or tell the difference between right and wrong. It also doesn't mean that they shouldn't be held responsible for their actions. But an awareness of these differences can help parents, teachers, advocates, and policy makers understand, anticipate, and manage the behavior of adolescents.

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