



## Cruel and Unusual Punishment: The Juvenile Death Penalty

# Adolescent Brain Development and Legal Culpability

*"[They] frequently know the difference between right and wrong and are competent to stand trial. Because of their impairments, however, by definition they have diminished capacities to understand and process mistakes and learn from experience, to engage in logical reasoning, to control impulses, and to understand the reactions of others.... Their deficiencies do not warrant an exemption from criminal sanctions, but they do diminish their personal culpability."<sup>1</sup>*

This point was made in the *Atkins v. Virginia* Supreme Court decision (2002) that banned the execution of the mentally retarded. As supported by recent scientific research, this argument applies equally to offenders under 18 years of age.

Adolescence is a transitional period of life during which a child is becoming, but is not yet, an adult. An adolescent is at a crossroads of changes, where emotions, hormones, judgment, identity and the physical body are so in flux that expert researchers, as well as parents, struggle to fully understand their impact.

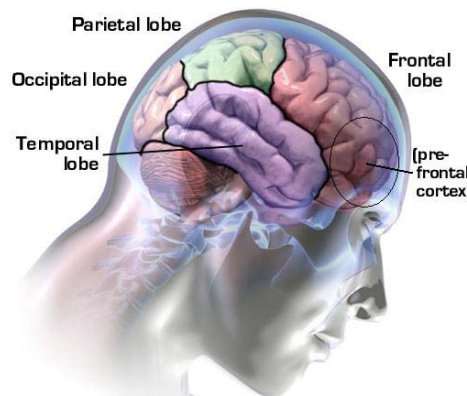
As a society, we recognize the limitations of adolescents and restrict their privilege to

drive, drink alcohol, smoke, vote, marry, enter into contracts, and even watch "R"-rated movies. Each year we spend billions of dollars for drug prevention and sex education to protect youth during this vulnerable time. Thus, when it comes to capital punishment, society is guilty of a critical contradiction when we subject adolescent offenders to the death penalty.

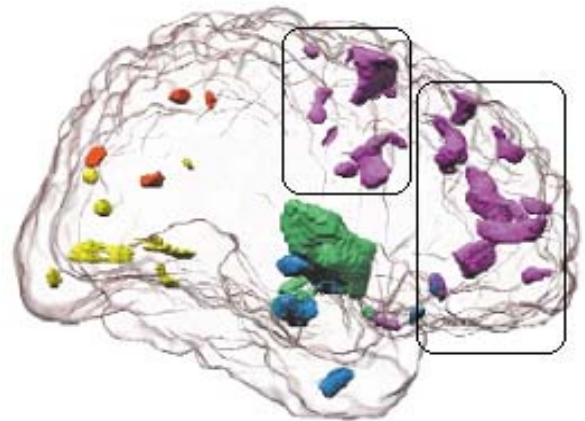
### The Adolescent Brain

Along with everything else in the body, the brain changes significantly during adolescence. In the last five years, scientists have discovered that adolescent brains are far less developed

### Lobes of the Brain:



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A three dimensional "map" showing portions of gray matter "pruned" from the brain between adolescence and adulthood. The dark portions in the two boxes indicate those of the frontal lobe. The box on the far right indicates those of the part of the frontal lobe called the **prefrontal cortex**, the part of the brain that controls judgment. Image adapted from Nature Neuroscience.

than previously believed.

The human brain has been called the most complex three-pound mass in the known universe—and for good reason—it has literally billions of connections among its parts.

The largest part of the brain is called the frontal lobe. A small area of the frontal lobe called the prefrontal cortex, located behind the forehead, controls the most advanced functions. This part, often referred to as the "CEO" of the body, provides us with our advanced level of consciousness. It allows us to prioritize thoughts, imagine, think in the abstract,

<sup>1</sup> *Atkins v. Virginia*, 122 S.Ct. 2242, 2251.

anticipate consequences, plan, and control impulses.

## Brain Development

Researchers at UCLA, Harvard Medical School and the National Institute of Mental Health have teamed up in a massive project to “map” the development of the brain from childhood to adulthood.

These scientists are utilizing advances in magnetic resonance imaging (MRI) which provides three-dimensional images of the body without the use of radiation (as in an x-ray). This breakthrough allows scientists to scan children safely numerous times over many years.

What came as a surprise to scientists was the discovery that the brain undergoes an intense overproduction of gray matter (the tissue that does the “thinking”) during adolescence. Then, a period of “pruning” takes over, where gray matter is shed and discarded.

This process is similar to pruning the branches of a tree: cutting branches in some places stimulates growth overall.

The pruning process has been described as a “massive loss of brain tissue” by Paul Thompson, a member of the UCLA research team. Tissue is lost at a rate of 1 to 2% per year.

The pruning process is accompanied by myelination, a process in which the brain’s white matter, or “insulation,” focuses, refines and makes the brain’s operation more efficient. The pace and severity of these changes, which continue until one’s early 20s, have been carefully scrutinized by researchers. These changes mean that the brain is still developing.

Dr. Elizabeth Sowell, a member of the UCLA brain research team, has led studies of brain development from adolescence to adulthood (roughly ages 12 through 22). She writes that the frontal lobe undergoes the most change during adolescence--by far. It is also the last part of the brain to develop.

Both the pruning and the insulation process are critical to the brain’s development. Insulation affects the speed and quality of brain activity (see Paus, *et al.*) while pruning and the development of gray matter contribute to overall cognitive functioning, including the ability to reason effectively (see Casey and Reiss).



Dr. Elizabeth Sowell, UCLA School of Medicine

## Biology and Behavior

These correlations are providing new perspectives to the old question: “Why do teens behave the way they do?”

The answers to this question have widespread implications in the fields of education, mental illness, and juvenile justice, and were the centerpiece of a May 2000 White House Conference titled “Raising Responsible and Resourceful Youth.”

Jay Giedd, the lead researcher on the subject at the National Institute of Mental Health, explained to PBS’s *Frontline* that during adolescence the “part of the brain that is helping organization, planning and strategizing is not done being built yet.... 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.”

## Connections to Disorders and Culpability

Dr. Deborah Yurgelun-Todd of Harvard Medical School is one of the chief researchers on the relation between brain development and cognitive deficiencies. She says that the underdevelopment of the frontal lobe makes adolescents “more prone to react with ‘gut instinct’.” She says that the tendency to use the part of the brain called the amygdala (responsible for ‘gut reactions’) instead of the prefrontal cortex (responsible for reasoning) continues until adulthood, when individuals are able to respond more maturely.

MRI scans have shown that even the most sophisticated-appearing teenagers rely heavily on the amygdala, an instinctual part of the brain. Also, males use these ‘instinctual’ parts of the brain much more than females as the male frontal lobe develops more slowly than that of the female’s (Spinks).

Dr. Ruben C. Gur, neuropsychologist and Director of the Brain Behavior Laboratory at the University of Pennsylvania, explains that the frontal lobe is “involved in behavioral facets germane to many aspects of criminal culpability. Perhaps most relevant is the involvement of these brain regions in the control of aggression and other impulses.... If the neural substrates of these behaviors have not reached maturity before adulthood, it is

unreasonable to expect the behaviors themselves to reflect mature thought processes.”

Simply put, there is now biological evidence that adolescents do not have the same ability as adults to make sound decisions and to prevent impulsive behavior.

Dr. Gur writes: “The evidence now is strong that the brain does not cease to mature until the early 20s in those relevant parts that govern impulsivity, judgment, planning for the future, foresight of consequences, and other characteristics that make people morally culpable.... Indeed, age 21 or 22 would be closer to the ‘biological’ age of maturity.”

### Other Changes in the Body

In addition to the profound physical changes of the brain, adolescents also undergo dramatic hormonal and emotional changes.

One of the hormones having the most dramatic effect on the body is testosterone, closely associated with aggression, which increases its levels tenfold (see Adams).

Emotionally, an adolescent “is really both part child and part adult,” according to professor and author Melvin Lewis. Normal emotional development includes a period of self-searching, where the adolescent tries to grow out of the child. This involves a conflict between building identity and facing childlike insecurities. The well-known behaviors associated with this process include self-absorption, a powerful need for privacy, mood swings, dressing uniquely, and participating in forms of escapism such as video

games, music, talking on the phone, and riskier behaviors such as using drugs or engaging in sexual activity (see Lewis and Cobb).



*Dr. Jay Giedd of the National Institute of Mental Health. Image courtesy of PBS Frontline report Inside the Teenage Brain.*

### Development and Delinquency

The turmoil often associated with these changes sometimes results in poor decisions and desperate behaviors.

Studies find that 20 to 30 percent of high school students consider suicide, and that suicide is the third-leading cause of death among teenagers, occurring once every two hours – well over 4,000 times a year, according to the US Surgeon General.

Running away from home is also common, as the General Accounting Office estimates 1.3 million kids are on the street each year.

The US Office of National Drug Control Policy’s estimates that 10.8 percent of persons between ages 12 and 18 used an illicit drug “in the past month” (well above the national average of 7.1 percent of the population at large) and nearly a third of adolescents used alcohol.

Also, illegal acts are more common during adolescence than during any other time of

life. Estimates of the proportion of males who have been arrested before the age of 18 hover around 25%. This peak in criminal activity during adolescence is “quite stable across different social contexts” and “is present in all of the cultures studied to date” (Graber).

### “Triggers”

Research also shows that certain stressful experiences can trigger violent behavior, like a spark to flammable material. The American Academy of Pediatrics has identified several risk factors that can trigger violence in adolescents including being witness to domestic violence or substance abuse within the family, being poorly or inappropriately supervised, and being the victim of physical or sexual assault, among other things.

It should come as no surprise that juveniles who commit murder come from environments rife with these triggers. In 1987, Dr. Dorothy Otnow Lewis of New York University led comprehensive diagnostic evaluations of 14 juveniles on death row (at that time, 40 percent) in four states. She found that nine had major neuropsychological disorders and seven had psychotic disorders since early childhood. Twelve reported having been brutally abused physically or sexually, and five reported having been sodomized by relatives.

Other common characteristics included suffering trauma to the head and IQ scores under 90 (only two did better). Only three had average reading abilities, and another

three had learned to read on death row. Lewis also found that many of these dysfunctions were not presented to juries due to poor representation or the juvenile withholding or downplaying these facts out of embarrassment or bad judgment.

Dr. Lewis' primary findings were later corroborated by Robinson and Stephens (1992). They found that two thirds of all juveniles sentenced to death had backgrounds of abuse, profound psychological disturbances, low IQ, indigence, and/or intensive substance abuse.

## Conclusion

New scientific research confirms that adolescence is a time of transition. The adolescent is not an adult, and is subject to great limitations in judgment and maturity.

For social and biological reasons, teens have increased difficulty making mature decisions and understanding the consequences of their actions. Research suggests that these limitations persist until the early 20s.

Often, adolescents *grow out* of these less mature ways of dealing with problems, including destructive behavior. Studies show that more than half of all youths that pass through the juvenile justice system do not return.

This understanding does not excuse adolescents from punishments for violent crime, but it clearly lessens their culpability. This is the premise beneath society's across-the-board restrictions on voting rights, alcohol and tobacco consumption and serving in the armed forces. Indeed, this is

why we refer to those under 18 as "minors" and "juveniles" — because, in so many respects, they are *less than adult*.

Therefore, the death penalty for juveniles is a grave contradiction, and is contrary to our most fundamental notions of fairness, which accords punishment according to culpability.

The ABA urges all state legislatures to ban this practice at the earliest opportunity.

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More resources available at:  
[www.abanet.org/crimjust/juvjus/](http://www.abanet.org/crimjust/juvjus/)

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