

## Mental Illness and the Emerging Adult Brain



Abigail A. Baird, Ph.D.

The Laboratory for Adolescent Studies  
Department of Psychology  
Vassar College

## Are Young adults at increased risk for mental illness?

Yes, but the answer is not that simple

Like Toddlerhood, it is a period of rapid physical and neurological growth

Understanding the interplay of multiple risk factors is critical

## Depression

The “common cold” of mental illness

50% of young adults who experience an episode of major depression will not experience a second episode

More than just “the blues”

## Depression

Suicide is the third leading cause of death among people ages 15-24, and the second leading cause of death in college students ages 20-24

Most frequent Symptoms include feelings of sadness, hopelessness, despair, worthlessness, or lack of interest in usual activities  
these may be reported or observed

## Bipolar Illness

Used to be called “Manic-Depression”

People with bipolar disorder experience unusually intense emotional states that occur in distinct periods called “mood episodes.”

An overly joyful or overexcited state is called a manic episode, and an extremely sad or hopeless state is called a depressive episode.

Sometimes, a mood episode includes symptoms of both mania and depression. This is called a mixed state. People with bipolar disorder also may be explosive and irritable during a mood episode

## Bipolar Illness

Symptoms of mania or a manic episode include:	Symptoms of depression or a depressive episode include:
<b>Mood Changes</b> <ul style="list-style-type: none"> <li>- A long period of feeling “high,” or an overly happy or outgoing mood</li> <li>- Extremely irritable mood, agitation, feeling “jumpy” or “wired.”</li> </ul> <b>Behavioral Changes</b> <ul style="list-style-type: none"> <li>- Talking very fast, jumping from one idea to another, having racing thoughts</li> <li>- Being easily distracted</li> <li>- Increasing goal-directed activities, such as taking on new projects</li> <li>- Being restless</li> <li>- Sleeping little</li> <li>- Having an unrealistic belief in one’s abilities</li> <li>- Behaving impulsively and taking part in a lot of pleasurable, high-risk behaviors, such as spending sprees, impulsive sex, and impulsive business investments.</li> </ul>	<b>Mood Changes</b> <ul style="list-style-type: none"> <li>- A long period of feeling worried or empty</li> <li>- Loss of interest in activities once enjoyed, including sex.</li> </ul> <b>Behavioral Changes</b> <ul style="list-style-type: none"> <li>- Feeling tired or “slowed down”</li> <li>- Having problems concentrating, remembering, and making decisions</li> <li>- Being restless or irritable</li> <li>- Changing eating, sleeping, or other habits</li> <li>- Thinking of death or suicide, or attempting suicide.</li> </ul>

NIH Website

## Schizophrenia

About 1% of the population

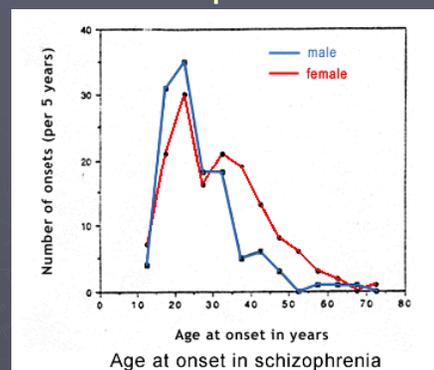
Encompasses many types of psychoses

High rate of suicide among young adults

At present, there is treatment but not a cure

Most stereotypes about schizophrenia are incorrect

## Schizophrenia



## Schizophrenia

After 10 years, of the people diagnosed with schizophrenia:

- o 25% Completely Recover
- o 25% Much Improved, relatively independent
- o 25% Improved, but require extensive support network
- o 15% Hospitalized, unimproved
- o 10% Dead (Mostly Suicide)

After 30 years, of the people diagnosed with schizophrenia:

- o 25% Completely Recover
- o 35% Much Improved, relatively independent
- o 15% Improved, but require extensive support network
- o 10% Hospitalized, unimproved
- o 15% Dead (Mostly Suicide)

(Source: [Surviving Schizophrenia](#))

## Medicating a developing brain?

Many general practitioners have prescribed incorrect medication at incorrect doses, and caused more harm than good

What will the long term effects of the medication be on the way in which the brain develops?

What are the long term effects of someone not participating in society on the way in which the brain develops?

## Why might young adults be at increased risk for mental illness?

Rapid changes in brain development

Rapid changes in social, emotional and environmental demands

## The human brain gives you what you need when you need it.

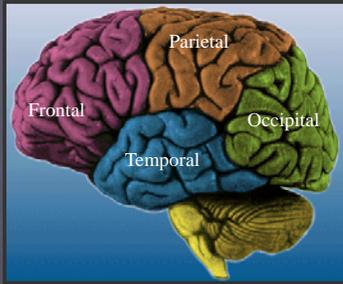
### Childhood

- Initial proliferation of connections
- Later pruning back of connections (use or lose)
- Brain volume reaches stability

### Adolescence

- Continued pruning
- Improvement in coordination across the brain

## The Lay of the Land

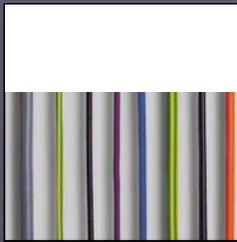


## Gray Matter: Processing

Where all the work is done  
Neurons connected together in large networks

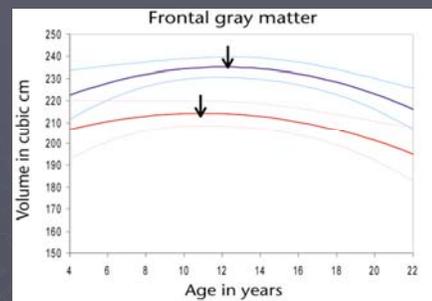


## White Matter: Connections

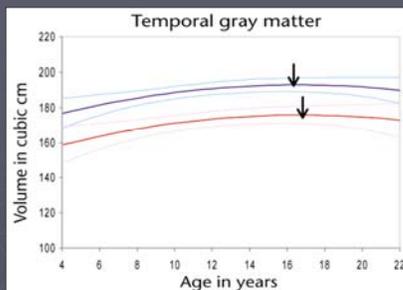


Like cable or wire  
Lets areas of the brain talk to each other, and to the rest of the body

## Giedd: Frontal



## Giedd: Temporal



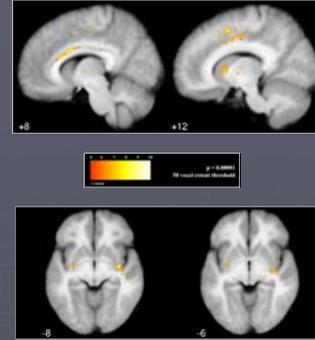
## Why are adolescents/Young Adults more vulnerable?

The intersection of programmed development and environmentally provoked change.



## Our Study

- 19 Dartmouth Freshman
- Three fMRI scans six months apart
- Methodological control condition (n=19)
- Age control condition (n=15)

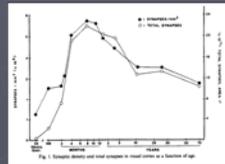


Bennett and Baird, 2006

## What is occurring?

Post-mortem information is key

- Proliferation done by 12 months

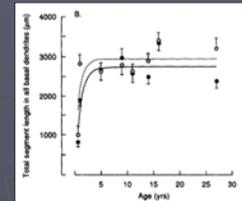


(Huttenlocher, 1990)

## What is occurring?

Post-mortem information is key

- Proliferation done by 12 months
- Dendritic length stable by 5 years

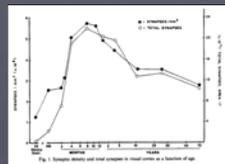


(Koenderink, 1994)

## What is occurring?

Post-mortem information is key

- Proliferation done by 12 months
- Dendritic length stable by 5 years
- Pruning finished by 16 years

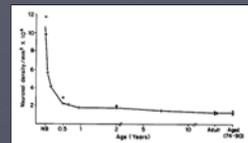


(Huttenlocher, 1990)

## What is occurring?

Post-mortem information is key

- Proliferation done by 12 months
- Dendritic length stable by 5 years
- Pruning finished by 16 years
- Neuron counts stable through 50 years



(Huttenlocher, 1979)

## Myelination

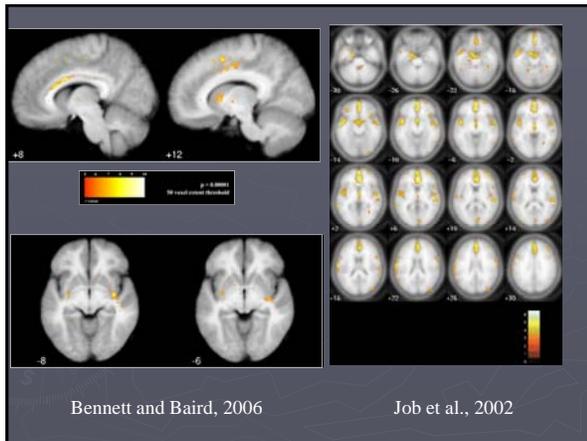


Which road gets more use?

Which one will get the most attention?

## Myelination

- Known to occur into the late 20s (and beyond)
- Influences signal propagation, attenuation
- Tracks with cognitive development  
(Nagy, Westerberg, Klingberg, 2004)
- Expression of functional maturity  
(van der Knaap, Valk, Bakker, Schooneveld, Faber, Willems, 1991)



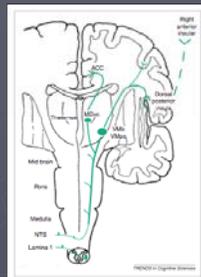
## Cingulate Changes

- Cognitive Subdivision
- Second order body representation
- Cognitive Integration



## Insular Changes

- Viceral Sense
- Interoception Ability



## Summary

- Structural changes in the emerging adult brain exist
- These changes occur in areas thought to be involved in the integration of emotion and cognition
- The changes represent the result of biological and environmentally provoked development