

Inside the Biology and Culture of
Gender:

Science and Theory for
Improving Services

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Gender Studies Project

What makes us who we are?

Human Development:

Genetics
+ Brain Biology
+ Environment
= Individual

% Environment?
% Biology?

- Each person is a unique individual
- Biology: Sex
- Environment: Gender roles - culture

- Science has come a long way
 - Past:
 - no thought about "male" or "female" brain
 - Today:
 - **good** scientific research today:
 - consideration of sex differences

Brain, Sex and Gender

- To Create New Paradigms:
 - Open-mindedness
 - Creative thinking
 - What good science research is telling us to:
 - Enhance existing services
 - Create more target specific services to our audiences

- Consider: Alcohol and Other Drug Research
 - Old research: No females in studies
 - Modern research: Extremely important differences between sexes which has impacted service delivery

- **2001 Report: National Academy of Sciences**
- “Sex, that is being male or female, is an important basic human variable that should be considered when designing and analyzing studies in all areas and at all levels of biomedical and health-related research”

Gender Sensitivity

- Gender Sensitivity means:
 - Being aware of
 - Understanding
 - Planning programs
 - And services for

Both Male and Female biology and cultures

Brain Development and Gender

- Males and Females differ, not only physically...
- But also in the way they approach and solve problems and view their worlds.

Cultural And Biological Together

Not Considering Both Creates:

- *Cultural* confusion (and tension):
- **Good:**
- Feminist Movement: Equal Rights
- **Not so Good:**
- Environment determines all behavior
- Equality – overtime-----→Sameness

Gender Role Confusion

- Expectation of respect for female body (sexual harassment)
- When equality becomes “sameness”
 - Co-ed High School Wrestling

Brain, Sex & Gender

- Just environmental?
- Scientists say No!
 - It's also the effects of sex hormones on brain organization and processing.
 - From the start, environment is acting on differently wired brains in males and females.

The Science of Neuroscience

- New technology –
 - Functional: PET, MRI
 - We now can take a “snapshot” of the living brain:
 - as it thinks
 - as it “feels” emotions

Brain Development and Sex Differences

Science is clear about the obvious-

Male and females being different:

- Biologically
- Structurally
- Functionally

Brain Development and Sex Differences

Also applies to male and female brain:

1. Structural differences
2. Processing differences
3. Developmental timeline differences

Brain Development and Sex Differences

- Estrogen (Female hormones).
- Testosterone (Male hormones).
- Starts in utero. Continues after birth.

New Research

- Not just hormones:
 - 2004 study:
 - looked at *protein* expression from X and Y chromosomes
 - Diff. so dramatic were able to correctly identify sex of brain tissue 100% of time by two gene expressions
(Neuropsychopharmacology, 2004)

What does research tell us?

- Hormones and gene expression =
 - Male/Female brains organized differently.
 - Creates differences in certain task, cognitive-emotive areas etc.
- Basic Processing Difference:
 - Compartmental vrs. Global

What Does Research Tell Us

- Physical differences
- Processing differences
 - Can create some “hard wiring” and processing of emotive responses to environment.

Spatial Tasks

- “Speaks” to male brain:
 - Moving objects through space and time
 - Right hemisphere highly activated – almost all in right half.
- Female brain has activity in both hemispheres - at slightly lower rate than males.

Verbal Tasks

- “Speaks” to female brain
 - Score higher on verbal accuracy tests
- Girls: high activity in both hemisphere
- Boys = Higher activity in only the left hemisphere

(Gurian, 2001)

Sex/Gender and Media

- Male brain drawn to –
 - less relational; more activity (including violence)
- Female brain drawn to –
 - more complex relational
 - less violent action

Verbal Accuracy Tests

- High Level Communicators
 - Difference in regulation of speech sounds
 - Male - mostly left brain activities boosted
 - Female - both sides equally boosted
- Females less likely to filter out peripheral data

Male and Female Brains

- **Areas in the frontal and temporal lobes related to language appear larger in females.**

(Schlaepfer, 1995)

Female babies have approx. 80% greater acoustic brain response

(Sax, 2005)

- **Region in the cortex related to spatial and visual larger in males.**

(Frederikse, 1999)

Newborn males >twice as likely to prefer mobile

(Infant Behavior and Dev. 2000)

Male and Female Brains

- Physical pain –
 - Cellular mechanism mediating pain is structurally different in males and females.
 - (Mitrovic, Ntl Academy of Sciences, 2003)
 - **Pregnancy affects pain sensation in females.**
 - (J of Comparative Psychology, 1990)

Brain and Gender

- Visual Sexual Stimuli
 - Both affected amygdala
 - Males significantly higher levels of activation
 - Despite similar reports of levels of arousal

(Hamann, 2004)

Sex Differences and Stress

- Oxytocin
 - “Bonding hormone” “Tend and Befriend”
 - Present in males – greater in females
 - Spikes during/after childbirth
 - Regulates bonding motivation, mood, behavior

Gender and Stress

- UCLA research (and others) showed:
- During stressful times:



In Females



In Males

Gender and Stress

- Behaviors associated with -
- Rise in Oxytocin:
 - Connection seeking; bonding
- Fall in Oxytocin:
 - Isolation, emotional shutdown and/or anger

Add in:

- Male brain less rapid integration of emotive and verbal parts of brain

Sex Differences in Amygdala

Amygdala: long term memory associated with negative emotional events.

Males: sig. Stronger activity in right hemisphere amygdala

Females: Stronger activity in left hemisphere amygdala

(Shors, 1998; Cahill 2001; Cahill 2004)

Memory Research

Females retain more detailed memories with stronger emotional context.

Males retain more global memory of event with less emotional context.

(Seidltz,Diener, 1998 Canli, 2002)

Evolution and Brain Differences

• Male and Female Brain Regulation

- Female brain: organized towards integration of verbal/ emotive processing
- Male brain: organized towards spatial/mechanical, factual processing, physicality

- Self selecting of activities/careers
- Development of the computer and computer games:
 - “speaks” to male brain
- Field of medicine – specialties of psychiatry and obstetrics draw higher numbers of women

Brain Maturation

- Brain of adolescent not completed until early twenties:
 - Physical thickening of frontal lobes (executive functioning)
 - Neural specialization and development
 - Crucial connections forming

Brain Maturation

- Frontal lobe – most massive changes (prefrontal cortex)
 - Judgment
 - Emotional processing
 - Language
 - Motivation
 - Goal setting
 - Problem solving
 - Impulse control

Brain and Maturation

- Developmental
 - Male and Female Brain:
 - Mature in different sequences & timelines
(Gur R, Turestsky B, J of Neuroscience 1999)
- Functional
 - Brain and negative emotions:
 - Adolescent female brain – larger fraction of brain activity moves to cerebral cortex
 - Adolescent male brain – greater fraction of brain activity stays in amygdala (Killgore W, NeuroReport 2001; Schneider W, Human Brain Mapping, 2000)

Sex Differences in Brain Maturation/Puberty

- Male brain is approx. 1.5 yrs. behind female brain maturation
- Brain maturation *not* correlated with puberty
- Puberty bathes brain in testosterone
- Testosterone linked to more aggressive behavior
- Puberty linked to more risk taking

Gender, Brain and Risk Taking

- Potential Threat or Risky Behavior (stress response)
 - Males – mostly Sympathetic NS
 - Sharpening senses
 - “Thrill” response (fight or flight)
 - Females – mostly Para Sympathetic NS
 - Nauseated and/or dizzy response (Evans J, J of Applied Physiology 2001)

Translate to Male Behavior

- ▣ U.S. and worldwide studies show boys more likely to engage in physically risky activities.

(Archives of Pediatrics and Adolescent Medicine, 2002)

Risky/dangerous activity triggers “flight or fight” that boys find enjoyable.

Risk/danger seen as fun “for its own sake” rather than to achieve goal.

Gender Differences

- Behavior
 - Girls *willing* to take risks
 - If means justifies the end
 - Boys *seek out* risk taking behavior
 - Simply for the “rush”
- Evolutionary Theory

Male Behavior Continued

- Boys *more* likely to experience:
 - Serious injury
 - Killed in accidents –
 - Drownings, firearm misuse, head injury
 - (American J of Public Health, 1998)
- Boys *less* likely to attribute injury to bad choice or lack of skill:
 - Bad luck
- Less likely to tell parents
- More likely to be around other boys

Gender and Aggression

- Elementary school boys fight 20 times as often as girls do.
 - Likely to enhance relationship
- Elementary girls fight less often, more likely to use words.
 - Usually involves relational cut off
 - (Lever, 1976 & 78; Simmons, 2002)
- The *same* holds true for primates!
 - (Blume, 1998)

Aggressive Play

- Boys more likely to engage in “rough and tumble” play.
- Same throughout primate species:
 - Males → physically rough play
 - Females → engage in “alloparenting”
- What evolutionary purpose did behavior serve?

Gender and Aggression

- For male primates:
 - Those deprived of play fighting/wrestling when young were **MORE** violent as adults not less!
 - Never learned boundaries of playful aggression vrs. violent behavior
- Implications for humans?

Gender and Aggression

- 2 yr olds: given choice of fairy tales–
 - Boys usually chose “violent” or scary
 - Girls chose warm, non violent
 - (Child Study Journal, 1996)
- J of the American Academy of Child and Adolescent Psychiatry:
 - 5 and 7 yr old girls who *prefer* violent stories; more significant behavior problems later on
 - Among 5 and 7 yr old boys – *no* such correlation
 - (2000)

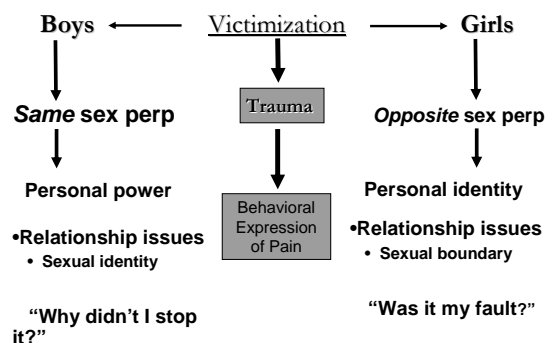
Male Culture

- Aggression -----→ Violence
 - (physicality -----→ destructiveness)
- Last 25 years:
 - Natural male behaviors are discouraged
 - Focus in schools and general culture
 - All aggression and physicality – bad
 - Competitive games at recess discouraged

Friendships and Sex Differences

- Female – “face to face” while males are “shoulder to shoulder” (D. Tannen, 2001)
- Boys friendships focus on:
 - Small to large groups
 - Shared interest in game/activity
 - Conversation not being the central focus
 - Avoidance of deep self-revelation

Gender and Trauma



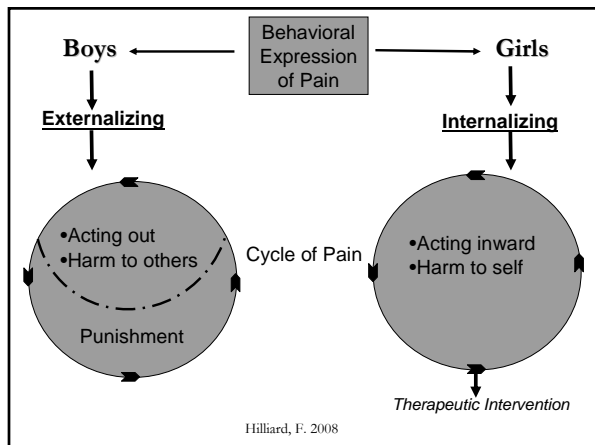
Gender and Trauma

- Male sexual abuse/assault:
 - Contradicts “definition of masculinity”
Can’t see themselves as victims
 - Rather as failures for not being able to do something to stop it.
 - Little “emotional language” to help healing

Gender and Trauma

- 1998 Study = 7,000 children
- “would never tell anyone about the abuse”
 - 48% of boys
 - 29% of girls

(Kipnis A. Bad Boys, 1999)



Boys At Risk Workgroup

Part of a federal adolescent treatment grant:

Major Conclusions – **Micro social:**

- Absence of Male Role Models
 - Biological father is absent or unknown
 - No substitute male role model to teach moral development into healthy manhood

Substitute Male Role Models

- **Media Culture**
 - Portrays males as super “macho”
 - Any emotion except Anger is “weak”
 - Tough, dominant and unfeeling
 - **World Wrestling Federation**
 - **Media: Terminator**

Boys At Risk Workgroup

Major Conclusions **Macro social:**

- Cultural Attitudes Toward Normal Male Developmental Behavior Considered Unhealthy or labeled Pathological
 - Reflective in Language:
 - Defiant, disruptive
 - No word for aggressive behavior that is non-violent

Boys and Education

- *Average 11th Grade Male* writes at the same level as the average 8th Grade Female (US Dept. of Ed, "Educational Equity for Girls and Women, 2000)
- Make up 2/3's of students in special education
- Are 80% of students diagnosed with E.D. or Autism

What we know about boys...

- Boys are twice as likely to be the victims of physical abuse and are three times as likely to be victims of violence as girls.
- Twice as many boys as girls are injured or die from physical abuse at the hands of parents and caregivers.
- Emotionally disturbed boys outnumber girls four to one.

(Gurian, Wonder of Boys)

Youth And Suicide

- Suicide – 3rd Leading Cause of Death Among Youth 10-24yrs
- **CDCP Website:**
 - Youth and Suicide Ages 10-24yrs: 82% Male 18% Female

- By the age of nine, most boys have learned to repress almost all primary feelings except anger.
- For many boys, rage becomes the primary conduit to express pain, fear, sadness and grief.
- Boys are four times more likely to commit suicide than girls.

Gurian, et al

New Paradigm

- **Action Philosophy**

Developmental & Therapeutic Framework

- Defining through "doing"
- Active behavior in young males:
 - Creates connections
 - Forms and creates deep relationships
 - Sense of pleasure
 - Avenue for learning about self and others
 - Deepens life experience

Action Philosophy

- Young males spend (need) a good deal of time developing sense of self through doing and action rather than talking and in-depth conversation
- Powerful sense of self is seen through powerful action. Young males will seek out what they see as powerful actions or "rites of passage" into manhood
- If not guided in this action, will seek out powerful negative actions (gangs, violence) for connection and passage into manhood

Recommendations

- Develop methods for adolescent males to resolve emotional conflict other than or in combination with talk therapies
- Change language to reflect basic respect for young males and their development
- Create activities for young males helping guide them into adulthood