Understanding Aggression

A Cumulative Model for Understanding Aggression

- Genetic Predisposition
- Physiological Influences
- Learning History
- Environmental Stressors
- Cognitive Reasoning
- Opportunity

Personal Tendency Toward Violence

Situational Tendency Toward Violence

Aggression Line
Definition of Aggression

• Physical or verbal behavior intended to hurt someone
• Two types
  – hostile (reactive) aggression; springs from anger, goal is to injure
  – instrumental aggression - aim is to hurt as a means toward a goal

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Personal Tendency Toward Violence
Situation Tendency Toward Violence

Genetic Influences

Is Aggression Natural?

• Natural to humans as a species?
• Natural to certain groups?
• Natural to certain individuals?
  – Aggression gene
  – Heredity
Is Aggression Natural?
Humans as a Species

- Archeological findings
  - Olduvai Gorge
    - Northern Tanzania
    - Over 2 million years old

- Aggression as an instinct
  - All members of a species must do it
  - Cannot be the result of learning
  - Cannot be a reflex

Is Aggression Natural?
Aggression as an Instinct

- Inhibition Theory
  - Humans and animals possess an aggressive drive
  - Animals have an instinct that inhibits aggression
  - Humans don’t have such a drive

Is Aggression Natural?
Aggression as a Drive

- Hydraulic Model
  - Aggression is a drive like other drives
  - Catharsis

  Neutral Target
  Object Person

  Fantasy
  Observation
  Verbal
  Physical
Is Aggression Natural?
Group Differences

• Gender
• Race
• Culture

Aggression is Caused by Sociobiology

• Individual Goals
  – Survival
  – Representation in the next gene pool
• Four Components
  – Reproductive fitness
  – Selfishness
  – Kin selection
  – Reciprocal altruism

Reproductive Fitness

• Strategy 1
  – Few offspring
  – high effort in maintaining
• Strategy 2
  – Many offspring
  – low effort in maintaining
Selfishness

- Successful genes are ruthlessly selfish
- Examples
  - Blackhead gulls eat other gulls’ babies
  - Emperor penguins in the Antarctic push each other into the water to see if there are Leopard Seals or killer whales

Kin Selection

Reciprocal Altruism

<table>
<thead>
<tr>
<th>Your Strategy</th>
<th>Partner’s Strategy</th>
<th>Remain</th>
<th>Silent</th>
<th>Testify</th>
</tr>
</thead>
<tbody>
<tr>
<td>Remain silent</td>
<td>5 years</td>
<td>30 years</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Testify</td>
<td>0 years</td>
<td>10 years</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Support for Sociobiology

Rape

• Support
  – Rape victims tend to be young
  – Age distribution of victims mirrors fertility distribution
  – Rape is found in species such as scorpion fly

• Problems
  – Can’t explain oral sex or anal sex
  – Many rapists are married or of high status

Homicide

• Only 33% of victims are killed by relatives
• About 15% are killed by a spouse and 4% by blood relatives
• Nongenetic coresidents are 11 times more likely to be killed than are genetic coresidents
• Child abuse and homicide more 40 to 100 times more likely with stepparent than biological parent (Daly & Wilson, 1988, 1989)
• Rates of violence are highest in men who are at their sexual peak; a time when competition makes evolutionary sense

Is Aggression Genetic?

Genetic Influences on Individuals

XYY Chromosome

• Statistics
  – 1 in 1000 people have an extra Y chromosome
  – 15 in 1,000 prison inmates have an extra Y
  – XYY is related to crime but not to homicide
• Alternative explanation: intelligence and height
Serial Killers with Genetic Disorders

Arthur Shawcross
IQ = 95

John Wayne Gacy
IQ = 118

Bobby Joe Long
IQ = 118

Richard Speck
- Mass murdered of 8 nurses in Chicago
- Defense claimed he had the XYY
- Later testing found this not to be true

Genetics
- 90% of height
- 70% of major depression
- 60% of intelligence
- 50% of smoking
- 40% of personality
- 40% of job satisfaction
- 50% of criminality
- 50% of aggression
- Many mental health problems
Genetic Influences on Individuals
Genetic Predisposition

• Aggression is the result of a genetic predisposition passed on by parents
• Research Support (Tryon, 1940)
  – Rats were observed
  – Rats separated into docile and aggressive groups
  – Rats observed 26 generations later
    • offspring of aggressive rats were aggressive
    • offspring of docile rats were docile

Genetic Similarity

• 100.00 Identical twins
• 50.00 Fraternal twins
  Siblings
  Parents
• 25.00 Grandparents
  Aunts/uncles
  Nieces/nephews
• 12.50 First cousins
• 6.25 Second cousins
• 0.00 Unrelated

Genetic Influences on Individuals
Genetic Predisposition

• Research Support (meta-analysis by Raine, 1993)
  – Concordance rates

<table>
<thead>
<tr>
<th>Genetic Relation</th>
<th>Biological Parent</th>
<th>Adopted Parent</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Together</td>
<td>Separate</td>
</tr>
<tr>
<td>Unrelated</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Siblings</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Fraternal twins</td>
<td>20.6</td>
<td></td>
</tr>
<tr>
<td>Identical twins</td>
<td>51.5</td>
<td></td>
</tr>
</tbody>
</table>
Genetic Influences on Individuals
Genetic Predisposition

- DiLalla & Gottesman (1990)
- Concordance rates from 6 Studies

<table>
<thead>
<tr>
<th>Twin Type</th>
<th>Adolescent Delinquency</th>
<th>Adult Criminality</th>
</tr>
</thead>
<tbody>
<tr>
<td>Identical Twins</td>
<td>87%</td>
<td>51%</td>
</tr>
<tr>
<td>Fraternal Twins</td>
<td>72%</td>
<td>22%</td>
</tr>
</tbody>
</table>

Genetic Influences on Individuals
Genetic Predisposition

- Christiansen and Mednick (1977) study of adopted Danish children
- Percentage of children becoming criminals
  - 13.5% neither parent criminal
  - 14.7% adopted parent criminal
  - 20.0% biological parent criminal
  - 24.5% adopted & biological parents were criminals

A Cumulative Model for Understanding Aggression

- Genetic Predisposition
- Prenatal Influences
- Learning History
- Environmental Stresses
- Cognitive Reasoning
- Opportunity
- Situational Tendency Toward Violence
- Personal Tendency Toward Violence
Physiological Influences
The Amygdala

• Thought to be the “aggression center”
• Is involved with associating stimuli with reward and punishment
• Removal of amygdala reduces antisocial behavior
  – 39% marked reduction
  – 35% some reduction
  – 21% no reduction
  – 5% increase

Charles Whitman
August 1, 1966

• 12:00 a.m. – killed mom
• 3:00 a.m. – killed wife
• 11:30
  – Killed receptionist
  – Killed two couples
  – Shooting Spree
    • 16 dead
    • 30 wounded
Physiological Influences

Hormones

• Aggression increases after an injection of male hormones
• Testosterone levels higher in people committing unprovoked violent crimes than in non-violent crimes
• After age 25
  – androgen levels decrease
  – violent crime rates decrease

Testosterone
Dabbs & Morris (1990)

• Studied 1,496 Vietnam Vets
• Vets with high testosterone levels and low social integration (e.g., low SES, unmarried) most likely to be delinquent

<table>
<thead>
<tr>
<th>Social Class</th>
<th>Testosterone Level</th>
</tr>
</thead>
<tbody>
<tr>
<td>Low</td>
<td>14.7% 30.7%</td>
</tr>
<tr>
<td>High</td>
<td>4.5% 4.1%</td>
</tr>
</tbody>
</table>

Physiological Influences

Blood Sugar

• Aggressive behavior increases when blood sugar levels are low
• Hypoglycemia
  – 46% of arsonists
  – 17% of controls
• 11:00 a.m. - 11:30 a.m.
  – hypoglycemic symptoms peak
  – assaults in jails and prisons peak
Physiological Influences
Neurotransmitters

- Meta-analysis by Raine (1993)
  - Low levels of serotonin (5-HT) are related to aggression
    (d=-.47)
    - non-alcoholics (d=-1.23)
    - borderline personalities (d=-1.02)
  - No relationship for norepinephrine or dopamine
- Asperg (1997)
  - Low levels of serotonin associated with suicide attempts
    and completed suicides
- Fuller (1996)
  - Low levels of serotonin associated with violent criminals

Physiological Influences
Neurotransmitters

- Serotonin levels
  - Low in spinal fluid (Raine, 1993)
  - High in blood platelet cells (Moffitt et al., 1998)
  - Violent people seem to have serotonin in the synaptic
    terminal but it does not get released to the synaptic cleft
- Nutrition is important. Serotonin is reduced by
  diets low in
  - tryptophan (precursor of serotonin)
  - tyrosine (precursor of norepinephrine)
Physiological Influences

Physiological Arousal

- Antisocial personalities have lower resting heart rates (Raine, 1993)
- Ortiz and Raine (2003) Meta-analysis
  - Anti-social behavior in children
  - 40 studies, n = 5,868, d = -.44
- Theories
  - reduced fear
  - autonomic underarousal
    - optimal level of arousal
    - extroverts and introverts
    - Jim Turner’s theory

Physiological Influences

Complications During Birth

- Violent offenders more likely than nonviolent or non-criminals to have had a complicated birth
- Likelihood of violence increases with complicated birth and
  - parental psychiatric illness or
  - minor physical anomalies

Physiological Influences

Head Injuries

- Study of death-row inmates (Lewis, 1986)
  - All 15 claimed a history of head injury
  - 12 of 15 showed neurological impairment
- Study of 14 death-row juvenile offenders (Lewis et al., 1988)
  - All 14 had history of head injury
  - 8 of 14 severe enough to be hospitalized
- Study of 16 death row inmates (Freedman & Hemenway, 2000)
  - 88% (14) had history of head injury
  - 88% had been physically or sexually abused
  - 88% had parents who abused drugs and alcohol
Physiological Influences

Head Injuries

- Domestic Violence (Rosenbaum, 1991; Rosenbaum & Hodge, 1989)
  - 61% of males with violent dating/marital behavior
  - 52% of wife beaters
  - 22% of non-beaters

Hawley (2001)

- Studied 563 adults with head injuries
- 381 drove before their injury
- 139 drive after their injury
  - Half of these report increased anger, aggression, & irritability
  - Symptoms of road rage


Arthur Shawcross
Genesee River Killer

- Killed 2 children, 11 prostitutes
- Head injuries
  - 09 Hit in head with stone
  - 10 Hit head jumping into lake
  - 16 Hit in head with discuss hammer
  - 17 Hit in head with sledge hammer
  - 23 Fell 40' from ladder and hit his head, was unconscious
David Berkowitz
“Son of Sam”
- Killed 6, started over a thousand fires
- Head injuries
  - 7 Hit by a car, suffered head injuries
  - 7 Ran into a wall and suffered head injuries
  - 8 Hit in the head with a pipe, 4-inch gash in forehead

Richard Ramirez
“The Night Stalker”
- Killed 14
- Head injuries
  - 02 Dresser fell on his head, received 30 stitches, almost died
  - 06 Hit by a swing, knocked unconscious, caused a deep gash
  - 11 Diagnosed with epilepsy

Robert Garrow
- Killed 7 people
- Head Injuries
  - 2 years old: Mother splits his head open with a crowbar during a beating
  - 5 years old: Knocked unconscious when mother hits him in the head with a piece of wood
  - 6 Years old: Beaten unconscious by his father
  - 36: Receives head injury in auto accident
**Raymond Fernandez**

- Killed 17 people in the late 1940s
- History
  - Normal, friendly personality prior to injury
  - Was climbing stairs on a ship to America when a steel hatch cover hit him in the head
  - In coma for a week
  - Complete personality change when he came out of coma
  - Killed 17 women over next few years
  - Executed in Sing Sing in 1951

**Phineas Gage**

- September 13, 1848
- Cavendish, Vermont
- Gage was a foreman for a railway construction gang
- An explosion sent a 3' 7" tamping iron through his skull, landing 25 yards behind him
Phineas Gage

- Went back to work several months later, but his personality had changed
- He worked taking care of horses and working on a farm for the next 11 years
- In February, 1860, he began to have epileptic seizures and died May 21, 1860
- His body was exhumed in 1867 so scientists could study his skull

Physiological Influences
Brain Abnormalities

Physiological Influences
Brain Abnormalities
Physiological Influences
Brain Abnormalities

<table>
<thead>
<tr>
<th>Study</th>
<th>Violent Inmates</th>
<th>Non-Violent Inmates</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lewis et al (1985)</td>
<td>88%</td>
<td>27%</td>
</tr>
<tr>
<td>Bryant et al. (1984)</td>
<td>73%</td>
<td>28%</td>
</tr>
<tr>
<td>Pincus et al. (1979)</td>
<td>96%</td>
<td>22%</td>
</tr>
<tr>
<td>Williams (1969)</td>
<td>65%</td>
<td>24%</td>
</tr>
</tbody>
</table>

Physiological Influences
Study of 64 Murderers

<table>
<thead>
<tr>
<th>Group</th>
<th>Abnormal EEG Rate</th>
</tr>
</thead>
<tbody>
<tr>
<td>Psychotic</td>
<td>86%</td>
</tr>
<tr>
<td>No motivation or provocation</td>
<td>73%</td>
</tr>
<tr>
<td>Accidental while committing other crime</td>
<td>25%</td>
</tr>
<tr>
<td>Extensive provocation</td>
<td>17%</td>
</tr>
</tbody>
</table>

Physiological Influences
Brain Abnormalities

- 57% of violent criminals
  - 94% for homicide
  - 78% for rape
  - 61% for habitual aggression
  - 49% for pedophiles
- 15% of criminals committing single violent act
- 3% of the general population
- Damage is typically in the prefrontal area
Physical Attractiveness

- Facial defects (Masters and Graves, 1967)
  - 60% of criminals
  - 20% of controls
- Thompson (1990)
  - reviewed 9 studies
  - 6 showed reduction in recidivism following plastic surgery

Premenstrual Syndrome (PMS)

- Dalton (1961)
  - Study of 156 convicted women
  - 46% of crimes occurred within 4 days of menstruation
  - 26% would have been expected by chance

Heavy Metals

- Significant relationship between acting-out and violent behavior and exposure to:
  - lead
  - cadmium
  - manganese
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- Genetic Predisposition
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- Learning History

Situational Tendency Toward Violence
- Environmental Stresses
- Cognitive Reasoning
- Opportunity

Three Types of Learning
- Classical Conditioning
- Social Learning
- Operant Conditioning

Social Learning
- We Model
  - Parents
  - Siblings
  - People in our environment
  - People in the public eye (e.g., sports, media)
Violence in the Media - Frequency

- Average Child (Nielsen Media Research, 2000)
  - Watches 1,023 hours of TV each year (20 hours per week)
  - Goes to school 900 hours per year
- Media Violence
  - 61% of television shows contain violence
  - Prime time shows average 5 violent acts per hour
  - Cartoons average 25 violent acts per hour
  - 75% of violent acts are not immediately punished or condemned
  - 89% of top-selling video games contain violence
- By age 18, average person will have viewed 200,000 acts of violence and 16,000 murders

Violence in the Media - Effects

- Study of 208 inmates
  - 90% watch TV to learn new tricks
  - 40% have tried specific crimes seen on TV
- Research consensus
  - Moderate correlation
  - Some cause/effect

We tend to model people

- Similar to us
  - Sex
  - Race
  - Age
  - Background
- That are successful
- That have status
Through operant conditioning, we learn

- Consequences
- How to be reinforced
- Anger and resentment
- Social needs and skills
- Attachment to the community
- Coping skills
  - stress
  - anger
  - frustration

Peer Rejection

- Children who are liked are less likely to become antisocial (Dodge & Pettit, 2003)
  - 50% of children rejected by peers display conduct problems later in life
  - 9% of children not rejected display future conduct problems
- Children with ADHD
  - Less popular with peers
  - More likely to engage in antisocial behavior
- Social Skills
  - Emmers-Sommer et al. (2004) meta-analysis
  - Sexual offenders had lower social skills than controls (r = .33)

Exposure to Community Violence

- Sample
  - 27 studies, 37 independent samples
  - 17,322 adolescents
- Findings
  - Exposure to violence was related to psychological distress (r = .25)
  - This correlation is similar to that found with child sexual abuse and depression (r = .21)
  - Especially true:
    - In urban areas
    - With African Americans
    - When exposure was both victimization and witnessing
Effects of the Family
Child Abuse

<table>
<thead>
<tr>
<th>Type of Abuse</th>
<th>General Population</th>
<th>Serial Killers</th>
</tr>
</thead>
<tbody>
<tr>
<td>Physical</td>
<td>6%</td>
<td>36%</td>
</tr>
<tr>
<td>Sexual</td>
<td>3%</td>
<td>26%</td>
</tr>
<tr>
<td>Psychological</td>
<td>2%</td>
<td>50%</td>
</tr>
<tr>
<td>Neglect</td>
<td>18%</td>
<td>18%</td>
</tr>
<tr>
<td>Other</td>
<td>6%</td>
<td>Not applicable</td>
</tr>
<tr>
<td>No Abuse Reported</td>
<td>70%</td>
<td>32%</td>
</tr>
</tbody>
</table>

Comparison of Serial Killers to the General Population (Mitchell & Aamodt, 2004)

Effects of the Family
Child Abuse

- Mental Health
  - Paolucci, Genuis, & Violato (2001) meta-analysis
  - Children who were sexually abused were more depressed than controls (d = .44; r = .21)

- Widom (1989) study
  - 28.0% crime rate for victims
  - 21.1% crime rate for nonvictims
  - Effect greatest if abuse was physical or emotional but not both

Effects of the Family
Broken Homes

- No effects for the death of a parent
- Effects of Divorce Meta-Analysis (Price & Kunz, 2003)
  - 72 studies
  - 75% of incarcerated adolescents experienced divorced parents
  - Children of divorced parents more likely to engage in delinquency (d = -.16).
  - This is especially true:
    - In more recent studies
    - When the divorce occurred when the child was age 12 or younger
    - When the child is African American
  - Divorces that result in changes in family relationships (including remarriage) have greatest effect
Effects of the Family

- Poor parental supervision
- Inconsistent use of discipline
- Lack of parental warmth, acceptance, and affect
- Low frequency of joint child/parent activities
- Large families related to juvenile delinquency
  - affects only lower income families
  - affect is only for number of male children
- Low SES

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Environmental Stressors

Frustration-Aggression Hypothesis

- Frustration
  - increases the probability of aggression
  - is not the same as deprivation
- “Taste of success” leads to riots and violence
- We adapt to levels of success and failure
- Frustration has greatest effect when violent cues are present
Environmental Stressors
Physical or Verbal Assaults

- People do not “turn the other cheek”
- They use an “arm for arm, tooth for tooth” philosophy

Environmental Stressors
Other Causes

- Uncomfortable heat
- Unpleasant noise
- Crowding
- Darkness
- Heightened physiological arousal

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<tr>
<td>Physiological Influences</td>
<td>Opportunity</td>
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<tr>
<td>Learning History</td>
<td></td>
</tr>
<tr>
<td>Environmental Stressors</td>
<td></td>
</tr>
</tbody>
</table>
Cognitive Ability

- IQ
  - Mean = 100
  - SD = 15
- Delinquents score 8 points lower than non delinquents

Cognitive Reasoning

Expectancy Theory

- Developed by Victor Vroom
- Aggression = E * I * V
  - E = Expectancy
  - I = Instrumentality
  - V = Valence

Cognitive Reasoning

Reasoning is Affected by

- Alcohol
- Drugs
- Anger
- Stress
- Emotion
- Intelligence
- Knowledge
- Experience
- Age
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Opportunity
- Presence of law enforcement
- Presence of others
- Available victim
- Available weapon
- Appropriate social context