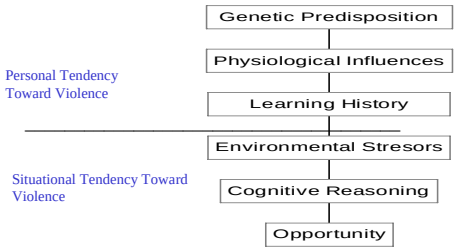
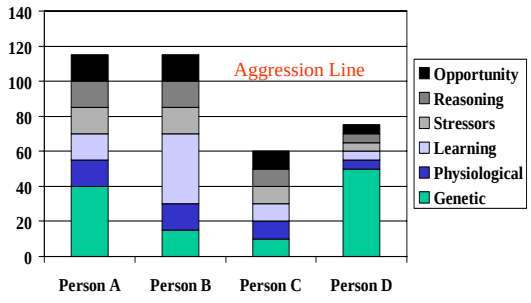
Understanding Aggression

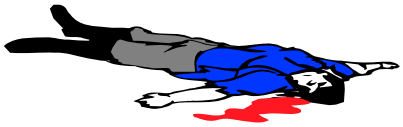
A Cumulative Model for Understanding Aggression





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



Facts to Consider

- Most people have thought about or fantasized about killing another person (Buss, 2005)
- People who kill once are very different than those who are habitually violent
- Few people kill more than once
  - Only 6% of paroled murderers were arrested for killing again (Lester, 1991)

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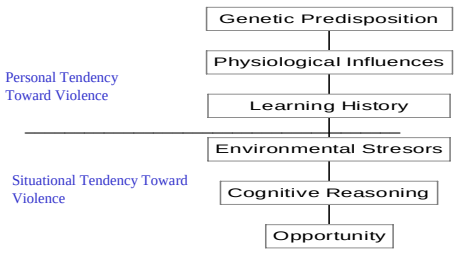


Genetic Influences
Is Aggression Natural?

- 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

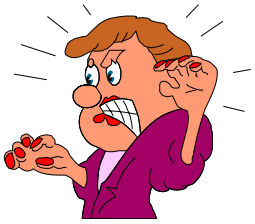
Is Aggression Natural?
Aggression as a Drive

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

	Neutral Object	Target Person
Fantasy		
Observation		
Verbal		
Physical		

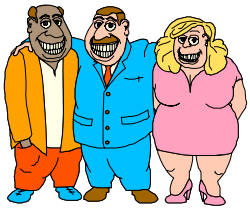
Is Aggression Natural?
Group Differences

- 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

Reciprocal Altruism

	Partner's Strategy	
Your Strategy	Remain Silent	Testify
Remain silent	5 years	30 years
Testify	0 years	10 years

Kin Selection

Support for Sociobiology
Homicide

- Only 33% of victims are killed by relatives
- About 15% are killed by a spouse and 4% by blood relatives
- Nongenetic coresidents are 11times 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)
  - Buss (2005) says that this eliminates resources spent on offspring that can't pass on our genes
- Rates of violence are highest in men who are at their sexual peak; a time when competition makes evolutionary sense

Why Would Women Kill Their Children?

- Evolutionary Reasons
  - Child has serious birth defect or illness
  - Mother has older children that need resources
    - Burying beetle
  - Mother does not have a mate
    - Child will not have the resources to survive
    - Mother will not be able to get a mate
- Psychological Illness

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

Gender & Murder

Sex	Percentage
Males killing men	62%
Males killing women	22%
Women killing men	10%
Women killing women	3%

Why It's Bad to Be Dead
(Buss, 2005)

- Genes can't be passed on
- Victim's wife is now available for mating
- Victim's children are vulnerable
- Victim's loses become others' gains
  - Jobs
  - Money
  - Potential mates

Why It's Good to Kill a Rival
(Buss, 2005)

- Prevent injury to self and family
- Prevent mate from being raped
- Acquire rival's resources and territory
- Establish reputation to scare other rivals
- New opportunity to have sex with rival's mate
- Eliminate an entire lineage of reproductive competitors

If Killing a Rival is Good, Why Don't We?
(Buss, 2005)

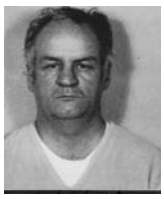
- Killing is risky
  - We might get killed
  - We might get caught and sent to prison
  - Potential mates might think poorly of us
  - Family of victim might retaliate against our family
- Alternatives
  - Form alliances to help against the rival
  - Get the rival to become part of the alliance
  - Ruin the reputation of the rival

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

XYY



Arthur Shawcross
IQ = 95

XYY

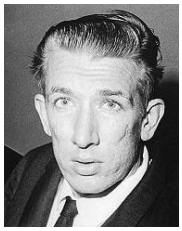
John Wayne Gacy
IQ = 118

XXY

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

	Biological Parent		Adopted Parent	
Genetic Relation	Together	Separate	Together	Separate
Unrelated				
Siblings				
Fraternal twins	20.6			
Identical twins	51.5			41.0

Genetic Influences on Individuals
Genetic Predisposition

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

	Identical Twins	Fraternal Twins
Adolescent delinquency	87%	72%
Adult criminality	51%	22%

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

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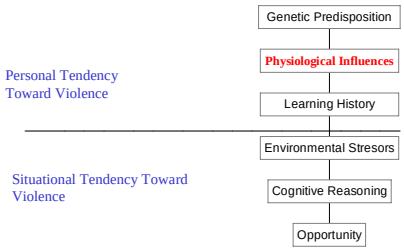
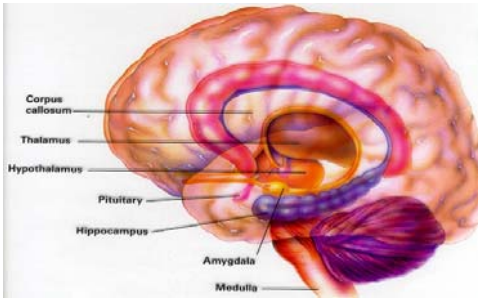


Physiological Influences
The Amygdala



Physiological Influences
The Amygdala

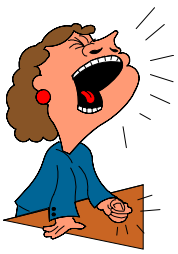
- Thought to be the "aggression center"
- Is involved with associating stimuli with reward and punishment
- Removal of amygdala reduces antisocial behavior
  - 39% marked reduction
  - 35% some reduction
  - 21% no reduction
  - 5% increase

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)

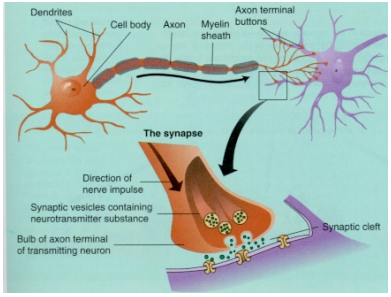
- Studied 1,496 Vietnam Vets
- Vets with high testosterone levels and low social integration (e.g., low SES, unmarried) most likely to be delinquent

	Testosterone Level	
Social Class	Normal	High
Low	14.7%	30.7%
High	4.5%	4.1%

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



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)

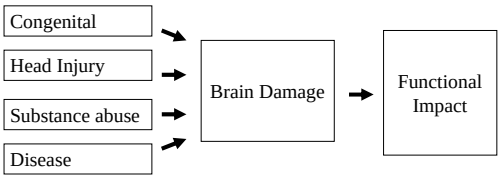
Physiological Influences
Physiological Arousal

- 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

Brain Damage



Self-Report
Medical Records

EEG
Neuroimaging
- MRI, PET

Neuropsych Testing

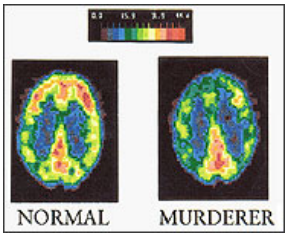
Collecting Head Injury Data

- Self Reports
  - Honest?
  - Accurate?
- What is a Head Injury?
  - Any head injury?
  - Loss of consciousness?
  - Hospitalization?
  - How many blows to the head?
- When Did it Occur?
  - Prior to being aggressive
  - Because they were aggressive (e.g., fight)
  - After they were already aggressive

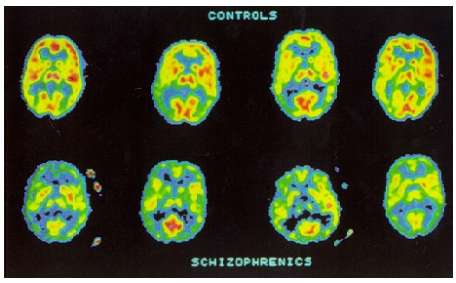
Physiological Influences
Head Injuries

- 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

Neuroimaging



Neuroimaging



Physiological Influences
Head Injuries

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

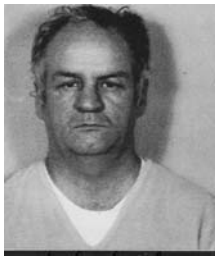
Hawley (2001)

- 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

Hawley, C. (2001). *Journal of Neurology, Neurosurgery and Psychiatry*, Volume 70, pages 761-766

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
  - 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

Robert Anthony Carter

- Killed 2 people by 17 in robberies
  - Sentenced to death
- Head Injuries
  - 5 years old: Hit on head with a brick
  - 5 years old: Mother hits him on head with a dinner plate
  - 10 years old: Hit on the head so hard with a baseball bat that the bat broke
  - 16 years old: Shot in the head by his brother – bullet lodged near his temple

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



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

Brain Abnormality/Head Injury

Moberg & Aamodt (2008) Meta-Analysis

Aggression Group	Brain Abnormality Measure			TOTAL
	Neuroimaging	Neuropsych Testing	Self-report	
Habitually Aggressive	52%	47%	45%	51%
Single aggressive	25%		14%	22%
Non-aggressive criminal	23%	20%	64%	50%
Inmates	27%	13%	38%	32%
Non-aggressive control	15%	11%	6%	9%

Physiological Influences
Study of 64 Murderers

Group	Abnormal EEG Rate
Psychotic	86%
No motivation or provocation	73%
Accidental while committing other crime	25%
Extensive provocation	17%

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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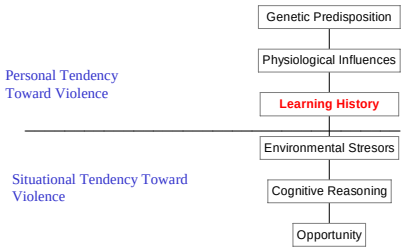
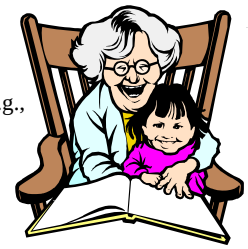


Three Types of Learning

- 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)

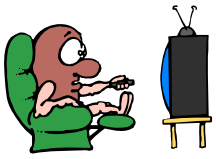


Violence in the Media - Frequency

- 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

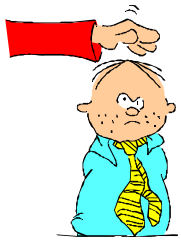


We tend to model people

- 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

- Wilson and Rosenthal (2003) meta-analysis
- 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

Comparison of Serial Killers to the General Population (Mitchell & Aamodt, 2005)

Type of Abuse	General Population	Serial Killers
Physical	6%	36%
Sexual	3%	26%
Psychological	2%	50%
Neglect	18%	18%
Other	6%	Not applicable
No Abuse Reported	70%	32%

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
  - 28.6% 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
  - Children of divorce are less likely to abuse alcohol (k = 7, d = .21)
- 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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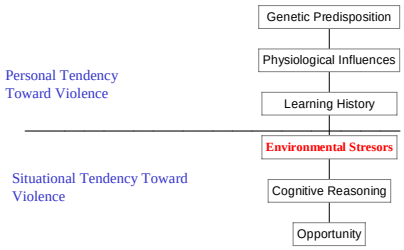
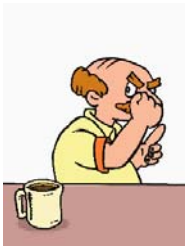


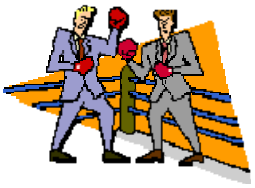
Environmental Stressors
Frustration-Aggression Hypothesis

- 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

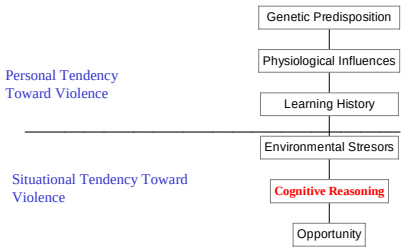
- People do not "turn the other cheek"
- They use an "arm for arm, tooth for tooth" philosophy



Environmental Stressors
Other Causes

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

A Cumulative Model for Understanding Aggression

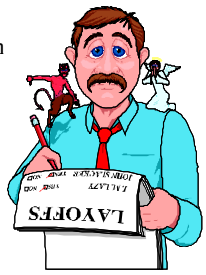


Cognitive Ability

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

Cognitive Reasoning
Expectancy Theory

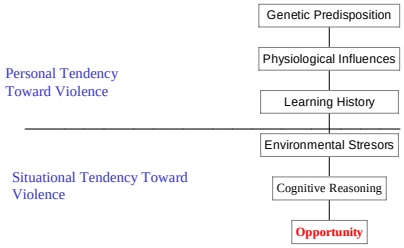
- Developed by Victor Vroom
- Aggression = E * I * V
  - E = Expectancy
  - I = Instrumentality
  - V = Valence



Cognitive Reasoning
Reasoning is Affected by

- Alcohol
- Drugs
- Anger
- Stress
- Emotion
- Intelligence
- Knowledge
- Experience
- Age

A Cumulative Model for Understanding Aggression



Opportunity

- Presence of law enforcement
- Presence of others
- Available victim
- Available weapon
- Appropriate social context