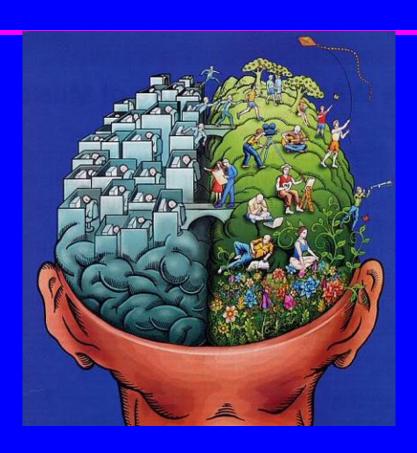
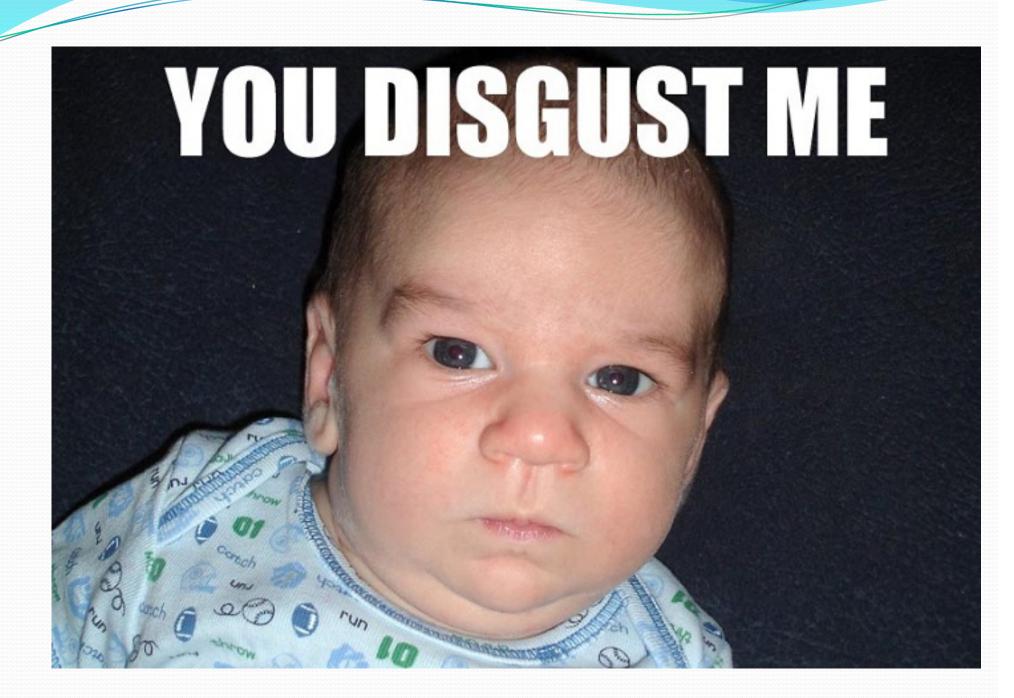
The Architecture of the Human Mind



EMOTION





Moral Judgment Problem

Julie and Mark are brother and sister. They are traveling together in France on summer vacation from college. One night they are staying alone in a cabin near the beach. They decide that it would be interesting and fun if they tried making love. At the very least, it would be a new experience for each of them. Julie was already taking birth control pills, but Mark uses a condom too, just to be safe. They both enjoy making love, but they decide not to do it again. They keep the night as a special secret, which makes them feel even closer to each other.

Was it OK for them to make love?

Moral Judgment Problems

A woman is cleaning out her closet, and she finds her old American flag. She doesn't want the flag anymore, so she cuts it up into pieces and uses the rags to clean her bathroom.

A family's dog was killed by a car in front of their house. They had heard that dog meat was delicious, so they cut up the dog's body and cooked it and ate it for dinner.

A man goes to the supermarket once a week and buys a dead chicken. But before cooking the chicken, he has sexual intercourse with it. Then he cooks it and eats it.

The "Specialized Mentality" Model of the Mind

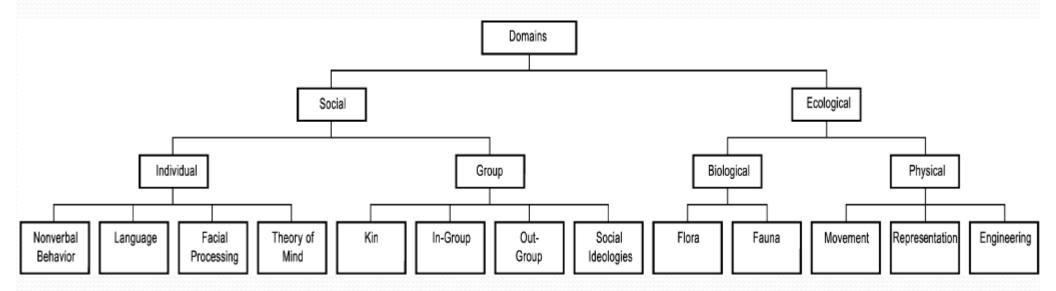


- The mind is an organ that has been shaped by natural selection
 - Evolution favored a highly specialized mind
- The mind consists of multiple highly specialized modules
- Narrow slices of environmental information are processed by specific modules & each module copes with specific adaptive problems
- Survival was too precious to be entrusted to "consciousness" and trial-and-error learning

Domains of the Mind

- * General-Purpose learning
- * Language
- * Social Intelligence
- * Technical Intelligence
- * Natural History Intelligence

Domains of the Mind



Specific Psychological Mechanisms that are Modules of the Mind

Expression of Emotion through Facial Expressions

Mechanisms for "Reading" Facial Expressions of Emotion

A Predisposition to Learn to Fear Things that Posed Danger in the Ancestral Environment such as Heights, Snakes, Spiders, & Deep Water

Language Acquisition Mechanisms

Mate Preference Modules

Sexual Jealousy Mechanisms

Kin-Recognition Mechanisms

Modules for Forming Social Contracts with Others

Specific Psychological Mechanisms that are Modules of the Mind

Modules for Categorizing Plants, Animals, and Other People

Innate Conceptions of Space, Time, and Motion

Modules for Orienting and Navigating through the Environment

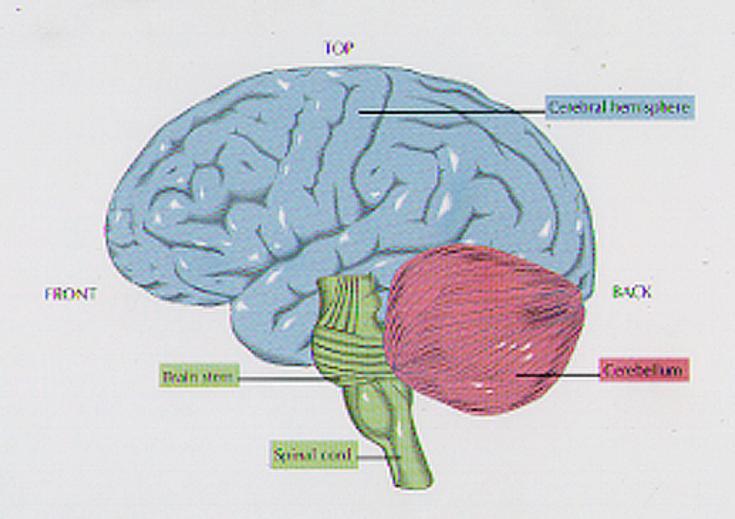
Module for Forming Moral Beliefs

Mechanisms for Detecting Deception and Betrayal

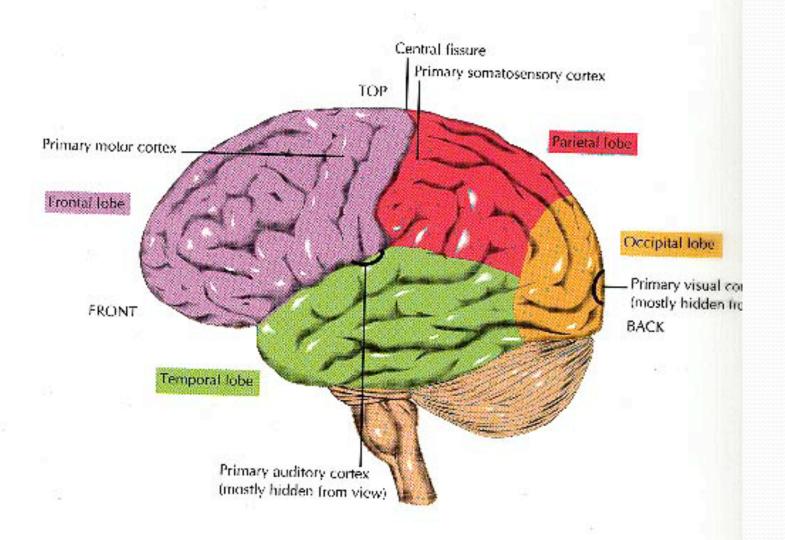
Modules for Processing Numerical Information and Music

Incest Avoidance Modules

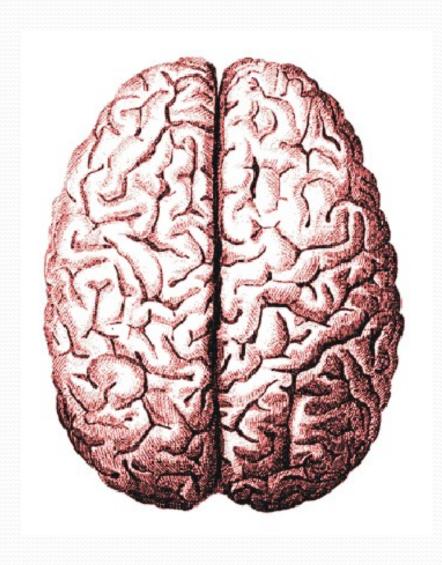
BIO 15 The Three Major Sections of the Brain



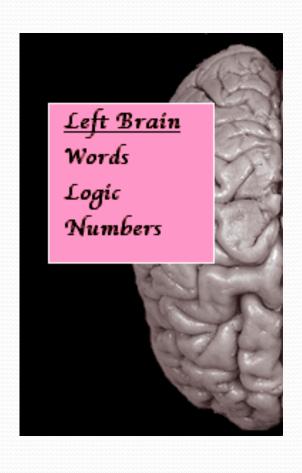
BIO 17 The Four Lobes of the Cerebral Cortex

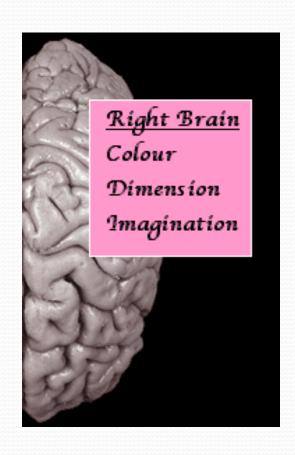


Hemispheres of the Brain

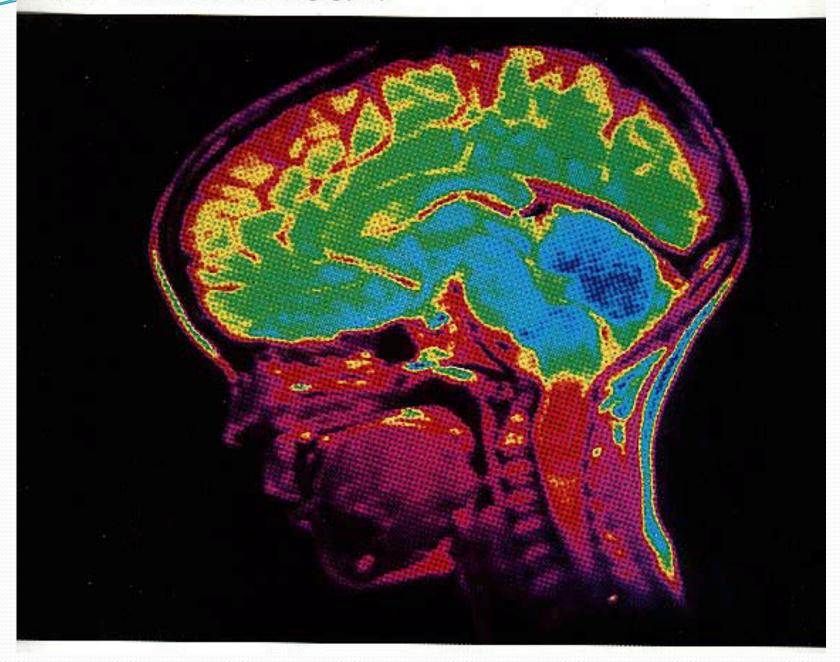


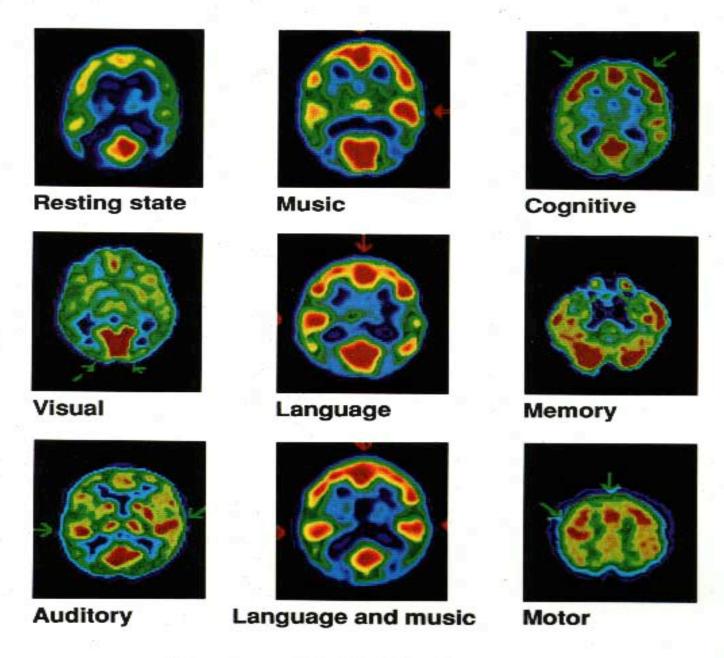
Hemispheres of the Brain





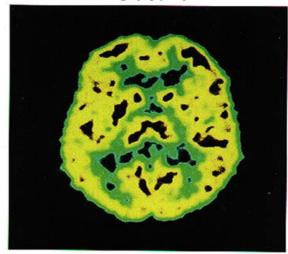
2-13, p. 53 Magnetic Resonance Imaging (MRI)



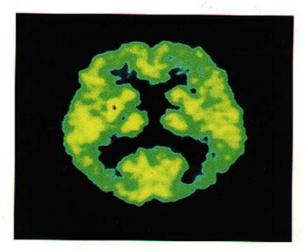


Normal PET Scans

-12, p. 52 Position Emission Tomography (PET)



Control



Alzheimer's Disease

logy, 2e by Ludy T. Benjamin, Jr., is and Jack Nation. 1990, Macmillan Publishing Company.

Some Psychological Disorders Due to Brain Damage

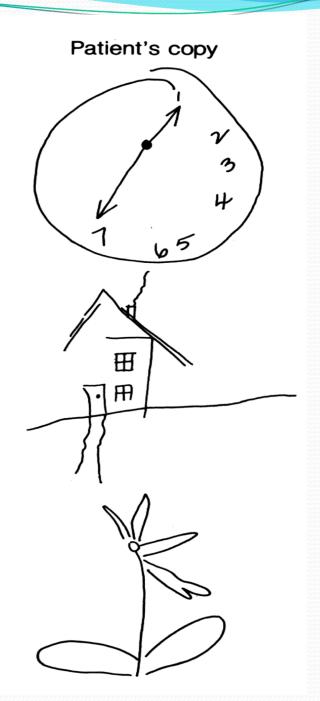
Aphasia - Language Problems

- Broca's Aphasia (Speaking)
- Wernicke's Aphasia (Comprehension)
- Alexia (Reading)
- Agraphia (Writing)
- Anomia (Naming)
- Acalculia (Math Operations)

Agnosia - Recognition Problems

- Object Agnosia
- Amusia (Tones)
- Prosopagnosia (Faces)
- Movement Agnosia
- Astereognosia (Touch)
- Neglect Syndrome

Model \blacksquare ⊞ ⊞ [\blacksquare



Milner's Syndrome & Korsakov's Syndrome

 A Complete Inability to transfer New Information into Long-Term Memory

Kluver-Bucy Syndrome

- Hypersexuality
- Lack of Emotion
- Compulsive Oral Exploration
- Psychic Blindness

Development of Cognition in Children

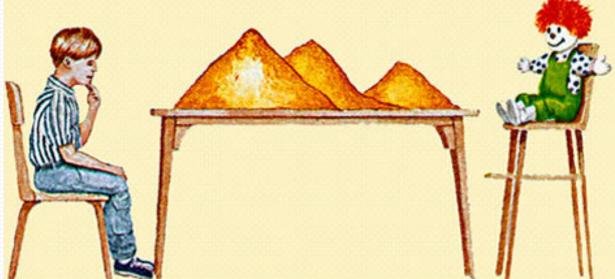
- The "5-to-7 Shift"
 - Faster RT develops
 - Better fine motor coordination
 - Faster Cognitive Processing
 - Self-Understanding/Self-Criticism

Theory of Mind (TOM)

- Necessary Precursor to the 5-to-7 shift
- Ability to understand others' perspective
- Detecting the Presence of Theory of Mind
 - False-Belief Tasks
 - "Mean Monkey"
 - The Three Mountain Problem
- Factors Affecting False-belief task performance
 - Parent income/education/occupation
 - Engagement in fantasy/pretend play
- Autism (Mindblindness?) as a failure of TOM?







Piaget's "3 mountains" egocentrism test:

"Draw how the mountains would look from the doll's point of view."

Three Mountain Problem

Structure of Language

- Phonemes
 - Smallest pronounceable unit of speech
 - Processed in parallel
- Morphemes
 - Smallest meaningful unit of speech (e.g., ing, de, ly, in)
- Constituents
 - Phrases or other basic units of sentence
 - Immediate Constituents = high level parts of sentence
 - Ultimate Constituents = individual words

Processing Language

- Comprehension of speech entails identification of constituents
- Syntax (rules of grammar) essential to language comprehension
- Must analyze constituents to identify:
 - Surface Structure of Sentence
 - Deep Structure of Sentence
- Speech Errors





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Nonverbal Aids to Language Use

- Pragmatics
- Nonverbal Cues
- Paralanguage
- All of the above are a form of "Metacommunication"

Is there a maximum size for a good conversation?



• YES – It is about four!

Patterns of Language Development in Children: Stages of Understanding Language

- Evidence that a fetus processes sounds of language:
 - Recognizes mother's voice at birth
 - Prefers native tongue at birth
 - Infants cry in rhythm of native tongue
- 4 months of age = recognizes name
- 6 months of age = clear preference for native vowel sounds
- 8-10 months of age = suppresses responses to sound combinations not found in native language
- Kids are learning *phonotactics*
 - Necessary for learning word boundaries & syntax
- Kids RECEPTIVE vocabularies > EXPRESSIVE vocabularies

Patterns of Language Development in Children: Stages of Generating Language

- 2 months of age = cooing/babbling
- 4-6 months = range of babbling gets restricted via operant conditioning
- 7 months = canonical babbling (syllables bigger than phonemes)
- 1 year = actual words mixed with canonical babbling
- 18 months = expressive vocabulary of about 50 words
- 2 years = 300 word vocabulary (concrete nouns appear first)
 - First, single words express complex ideas, then . . .
 - Duos/Telegraphic Speech
 - Kids have trouble
 - Learning synonyms & grasping that objects can have more than one name
- Between 2-3 years = Fluent grammatical conversation suddenly appears
 - Cross-culturally, girls produce language sooner than boys.

What Can Parents Do to Facilitate Language Learning?

- Children need to hear speech directed to them
- Use short sentences
- Use a lot of concrete nouns
- Avoid pronouns
- Restate child's clumsy sentences

Evidence for an Innate "Language Acquisition Device (LAD)"

- The ease with which kids in even linguistically impoverished circumstances learn language
- Highly specialized brain mechanism and neural circuitry devoted to language
- Linguistic characteristics common to languages everywhere ("universal grammar")
 - Kids effectively "create" language
- The importance of a critical period for language learning
- Universality of "Motherese"

WHY Did Language Evolve?

- It was adaptive! But when exactly did it appear?
 - Dunno
- Evolutionary Advantages of language:
 - Chunking large amounts of information symbolically
 - Facilitated communication of vital information
 - Location of resources, exploitation of new habitats
 - Female language superiority linked to her role as "gatherer?"
 - Intensely social nature of humans drove evolution of language (like grooming in primates)
 - Organization of large social groups
 - Dialects/languages may have evolved as a way of distinguishing ingroup from out-group members.
 - For kin selection/altruism purposes
- The Evolutionary Psychology of Gossip
- The "Ape Language" Controversy

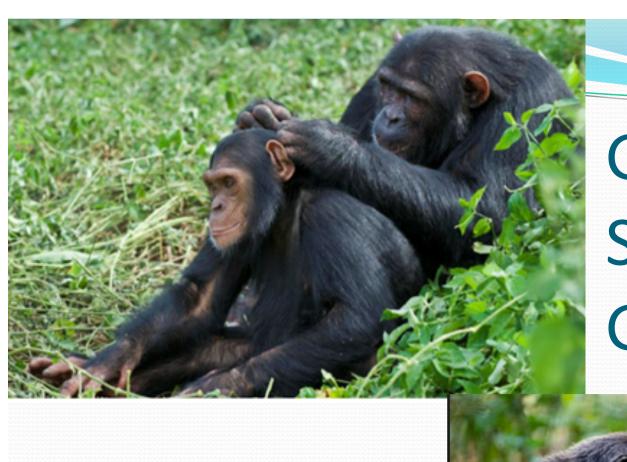
Competing Theories of Language as an Adaptation

- The Social Gossip Hypothesis
 - Social Bonding
- The Social Contract Hypothesis
 - Contracts for the smooth running of society
- The Scheherazade Hypothesis
 - Honest signaling advertising quality

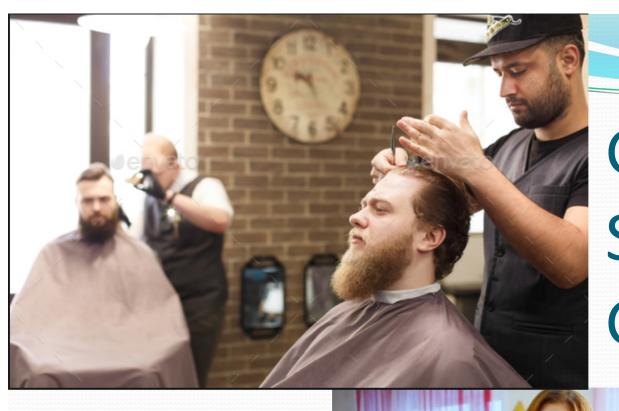
The Social Gossip Hypothesis

Social Bonding





Gossip as Social Grooming?



Gossip as Social Grooming?



The Social Contract Hypothesis

 Language enables contracts for the smooth running of society



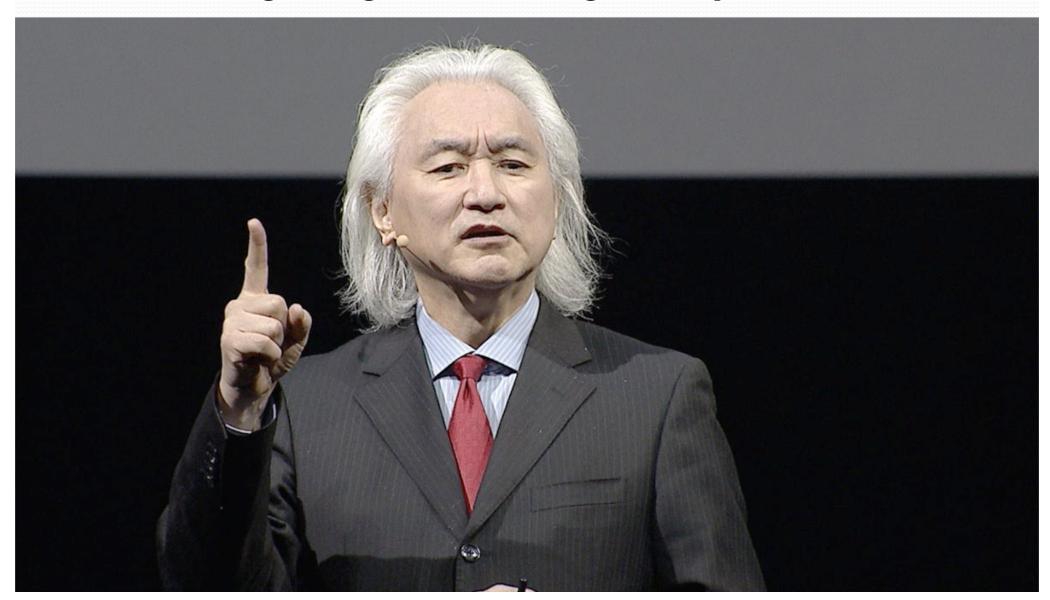
The Scheherazade Hypothesis

Honest Signaling = Advertising Quality

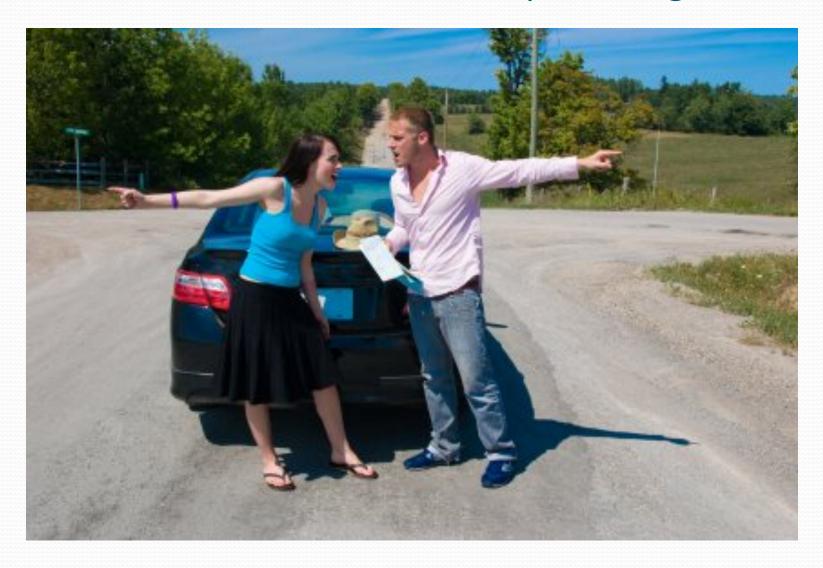


The Scheherazade Hypothesis

Honest Signaling = Advertising Quality

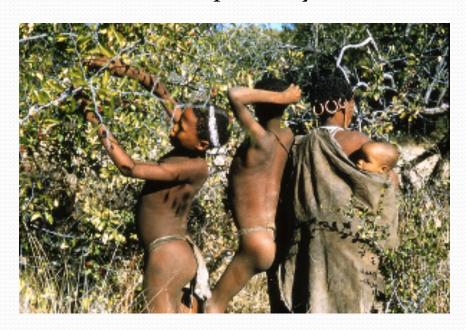


Sex & Individual Differences in Spatial Cognition



Sexual Division of Labor?

- There appear to be two different spatial cognition modules:
 - Object location in physical space
 - Female superiority consistent with gathering?
 - Wayfinding & mental representation of large-scale environments
 - Male superiority consistent with hunting?





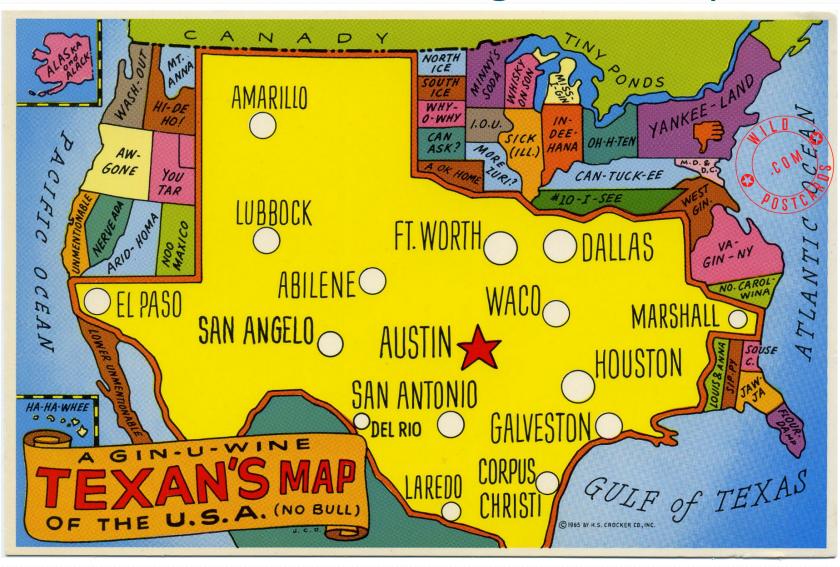
Cognitive Mapping



Distortions & Errors in Cognitive Maps

- Familiar places are centered and exaggerated in size
- Things are left out or things are added (augmentation)
- People regularize angles and create more "legibility"

Distortions & Errors in Cognitive Maps



Dimensions Used to Organize Cognitive Maps of Cities

(Kevin Lynch, 1960)

Paths: Routes or channels along which people move

Edges: Linear elements that serve as dividing lines

Districts: Medium to large sections of city that a person can be "inside of"

Nodes: Strategic locations that serve as transfer points while traveling

Landmarks: Physical objects that are unique, prominent, & important ("You can't miss it!")

Wayfinding: The Process by which people actually navigate through the environment

Two Wayfinding Skills:

Piloting – Using visible landmarks to navigate

Dead Reckoning – Sense of direction; kinesthetic cues Produced by walking

Things that facilitate clear cognitive maps & wayfinding

Landmarks located near intersections

Differentiation (Do all parts of environment look the same?)

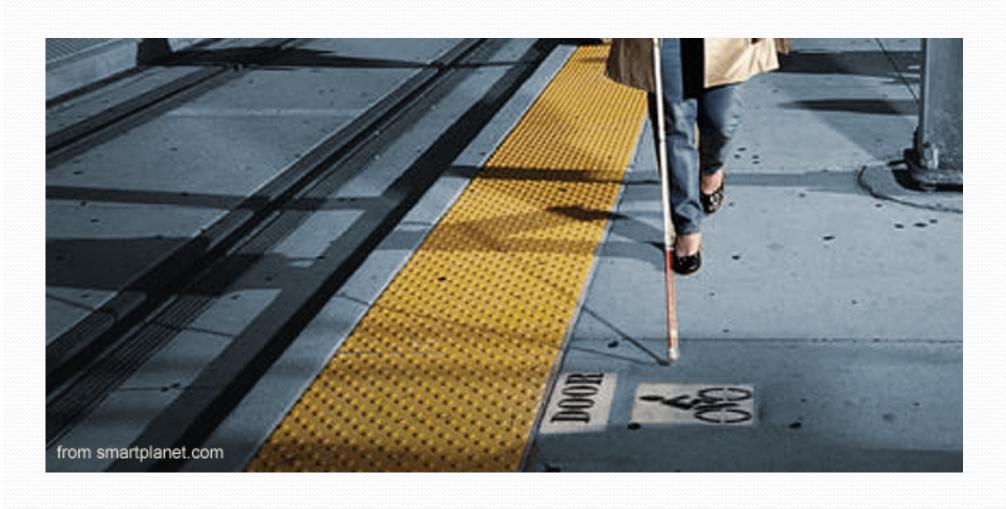
Degree of visual access

Complexity of spatial layout/floor plan

What Predicts Individual Differences in Cognitive Mapping & Wayfinding?



Cognitive Mapping & Wayfinding in the Blind





LHT

stands for

Life History Theory

. . .

by allacronyms.com

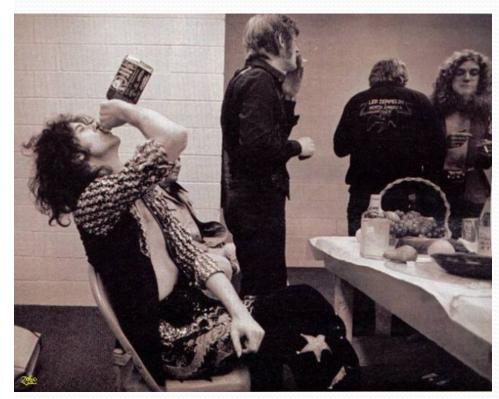


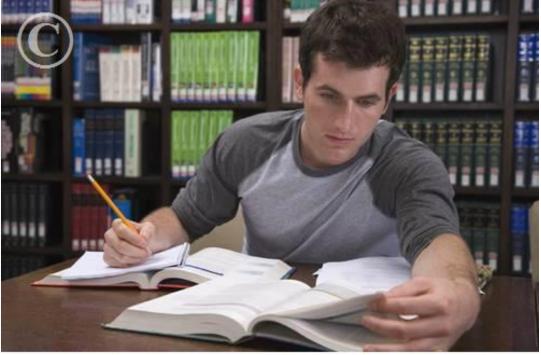
"Fast" versus "Slow" Life History Strategies





"Fast" versus "Slow" Life History Strategies





u15052195 [RF] © www.visualphotos.com

Development in Childhood



"Fast" versus "Slow" Life History Strategies



During first 5 – 7 years of life, the child internalizes what they can expect out of life and they prepare to live life under the circumstances observed in their parents.

PLAY



Types of Play

• Object Play:



Types of Play

• Social Play:



Types of Play

• Physical Play:





Why Do We Play?

- Scaffolding View of Play
 - Honing of skills needed for success as an adult
- Metamorphic View of Play
 - Play provides immediate benefits

Sex-Typed Patterns of Play

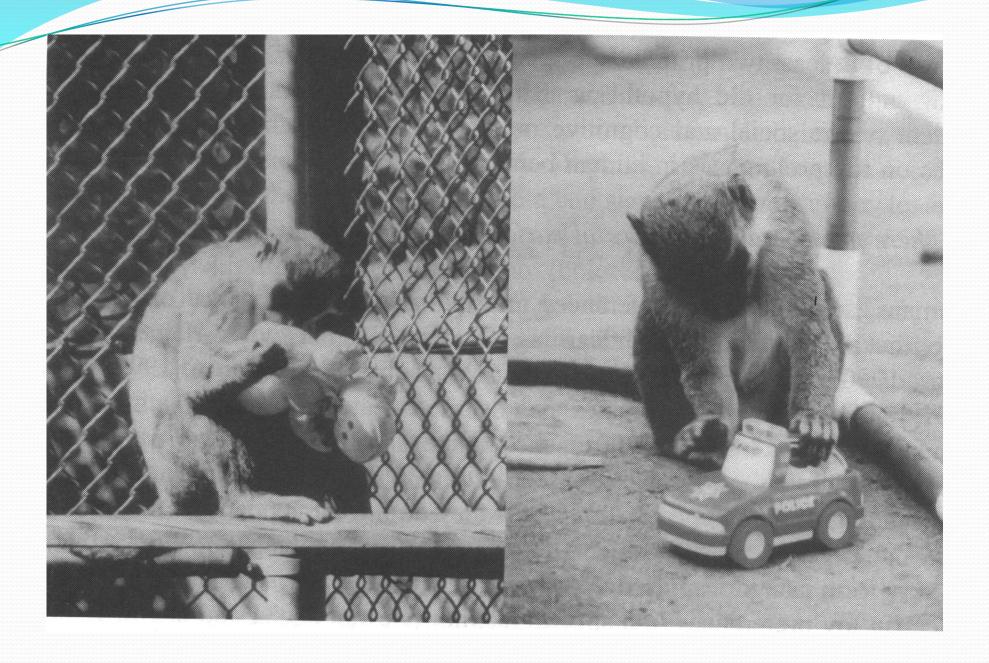




Sex-Typed Patterns of Play







Life

2.5

Weight of adult male African forest elephant 6 metric tons Weight of adult male African savanna elephant 5.4

Weight of adult male Asian elephant

Female chimps play with dolls

Youngsters mimic mothering by treating sticks as babies

By Bruce Bower

Deep in a Ugandan forest, Betsy Wetsy has gone wild. Young females in one African chimpanzee group use sticks as dolls more than males do, often treating pieces of wood the way a mother chimp would care for an infant, a new study finds.

The ape observations, collected over 14 years of fieldwork with the Kanyawara chimp community in Kibale National Park, provide the first evidence of a wild nonhuman animal exhibiting sex differences in play, two primatologists report in the Dec. 21 Current Biology. This finding supports a controversial view that biology as well as society underlies human boys'

and girls' contrasting toy preferences.

Young male Kanyawara chimps occasionally used sticks to mimic child care. But far more often they fought with sticks, an infrequent behavior among females, say Sonya Kahlenberg of Bates College in Lewiston, Maine, and Richard Wrangham of Harvard University.

"Although play choices of young chimps showed no evidence of being directly influenced by older chimps, young females tended to carry sticks in a manner suggestive of doll use and playmothering," Wrangham says.

Consistent with reported cultural traditions among adult chimps (SN: 11/21/09, p. 24), Kanyawara youngsters learn from each other to play with sticks as if caring for infants, the researchers propose. Childbearing females never played with sticks and thus didn't model such behavior for younger chimps.

"These new data suggest that sex differences in how children play may go



A young chimp cradles a piece of bark. In one group, females used objects as doils more frequently than males did.

way back in our evolutionary lineage and predate socialization in human cultures," says Elizabeth Lonsdorf, director of the Lester E. Fisher Center for the Study and Conservation of Apes at Lincoln Park Zoo in Chicago.

African elephants are two species

Forest and savanna dwellers prove distinct in gene analysis

By Tina Hesman Saey

Forest-dwelling African elephants are a separate species from Africa's savanna elephants, a genetic analysis shows. The research, published December 21 in PLoS Biology, "does a very thorough job of nailing shut the coffin on

some of the more heretical theories" about elephant evolution, says Stephen O'Brien, a geneticist at the National Cancer Institute in Frederick, Md., who was not involved in the research.

Forest and savanna elephants evolved into different species from a common ancestor between 2.6 million and 5.6 million years ago, the new analysis reveals.



A study shows that Africa's forest (left) and savanna elephants (right) are two species. Forest elephants are smaller, with more rounded ears and straighter tusks.

In the study, researchers compared nuclear DNA from living elephants as well as from a 43,000-year-old woolly mammoth bone from Siberia and from a 50,000- to 130,000-year-old North American mastodon tooth. The African forest and savanna groups are at least as different as Asian elephants and mammoths, the researchers say.

"I've always argued that they are very different, but that level of difference surprised me," says study coauthor Alfred Roca, a conservation geneticist at the University of Illinois at Urbana-Champaign.

People have debated for a long time whether the big savanna elephants and smaller forest elephants belong to one or two species. "This has been an ongoing debate since before genetics began," Roca savs.

The two pachyderms look different but sometimes come together and breed, producing hybrids. Hybrid males are sterile, but females can breed.

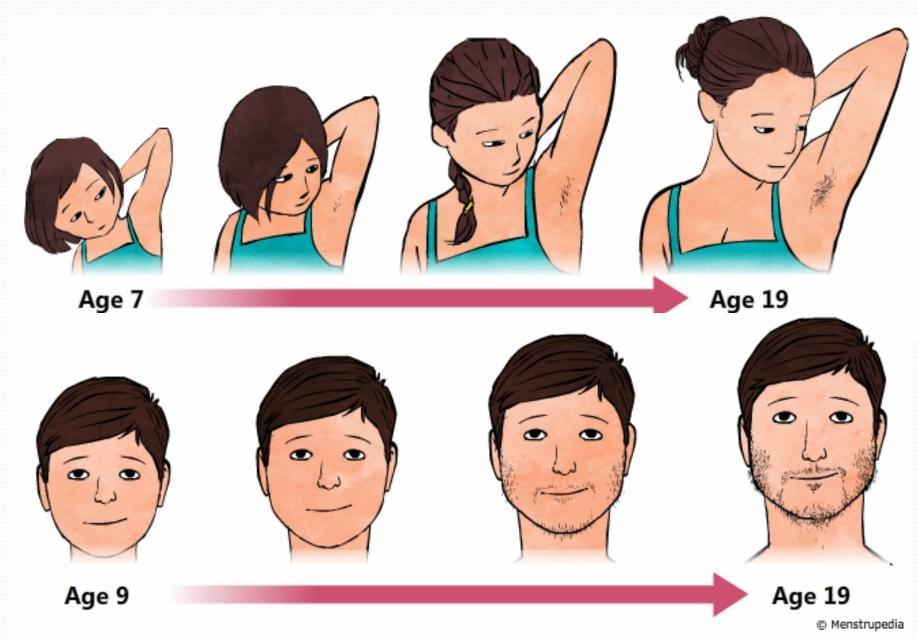
The study may not be the final word on the number of elephant species, but many researchers say it is convincing. "It's hard not to agree with this overwhelming amount of genetic data that gives such clear-cut answers," comments Sergios-Orestis Kolokotronis, a conservation geneticist at the American Museum of Natural History in New York City.

Why is Play Fun?

- It emphasizes *Biologically Primary Activities*
 - As opposed to Biologically Secondary Activities



Development in Adolescence



Factors Affecting Age of Human Menarche

- Genetics
- Nutrition Levels
- Predictability of Resources
- Levels of Family Stress
- Quality of Relationship with Parents
- Insecure Attachment Style as Infants

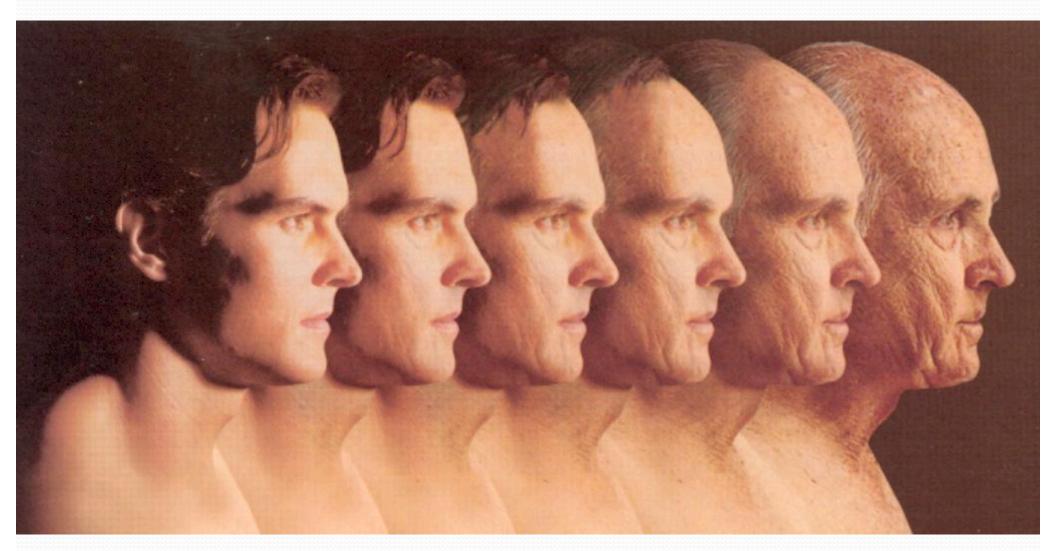
Consequences of Early Menarche

- Younger age for dating
- Younger age for first intercourse, marriage, birth of first child

Young age of modern society menarche is unheard of in hunter-gatherer societies, and it probably was in the EEA as well.



Why Do We Age?



What's Up With Menopause?



The Grandmother Hypothesis

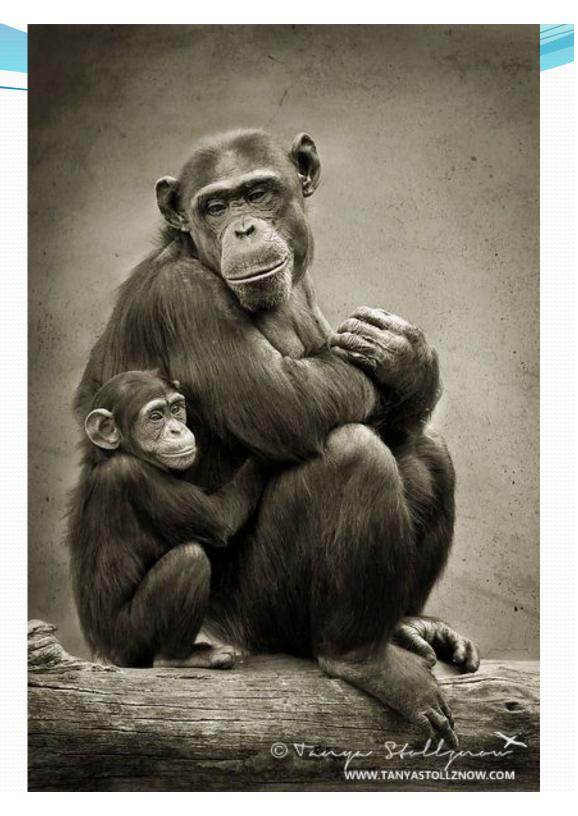


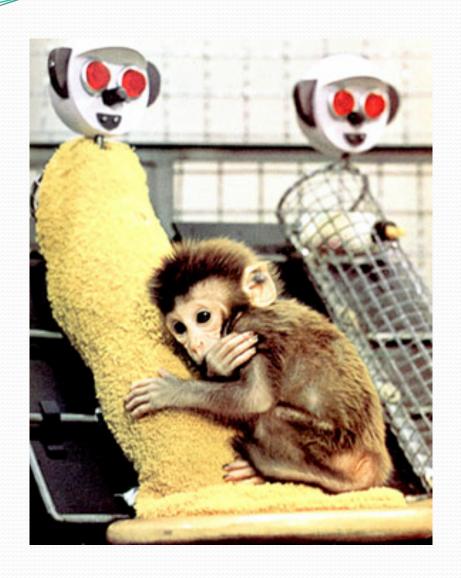
If our species is built on procreation and survival of the fittest why do women live well beyond reproductive age?

The Grandmother Hypothesis



Attachment







Stages in the Formation of Human Attachment

- First two months of life
 - Nonselective sociability
- About two months of age
 - Clear preference for familiar others
- About six months of age
 - Separation anxiety & fear of strangers
- By two years
 - Clear, powerful attachment to individual, especially mother
- By three years
 - Can tolerate periods of mother absence & temporary partnerships with others

Attachment Styles in Children

Strange Situation

Secure Attachment: (about 60-70% of American Kids)

- actively plays and explores, uses mother as a secure base
- distressed when mother leaves, pleased when mother returns; easily comforted following separation
- more direct contact with mother following separation

Avoidant or Anxious-Avoidant: (About 20% of American Kids)

- little attachment to mother (may even be friendlier to stranger)
- little separation distress, may avoid mom during reunions
- most likely to display anger

Ambivalent or Anxious-Resistant (About 10% of American kids)

- do not explore much; sticks close to mom
- intensely upset by separation; angrily resists contact during reunions

Disorganized - Disoriented

- most insecure style; very confused/contradictory reunification responses
- usually occurs only in seriously dysfunctional families

Attachment Styles in Adults

- Secure
- Anxious-Preoccupied
 - Likes intimacy, But fears rejection. Worrier!
- Dismissive-Avoidant
 - Independent; does not desire intimacy
- Fearful-Avoidant
 - Wants intimacy, but lacking in trust

Variables Related to Attachment Style

- Amount of physical contact
- Amount of maternal stimulation/encouragement
- Frequency/intensity of positive feelings directed toward infant
- Degree to which soothing techniques are effective at calming child
- Match between parenting style and needs of infant

Consequences of Attachment Style

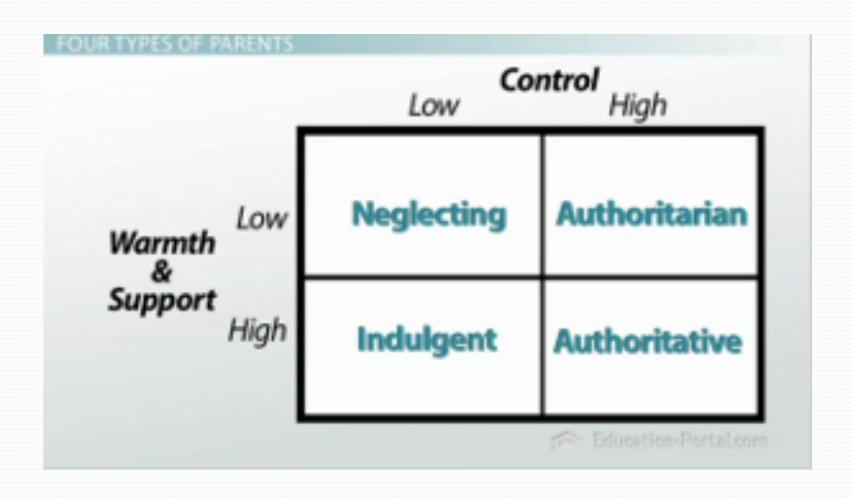
- Securely attached kids:
 - Decreased negative emotions at 2-3
 - Cooperate better with parents
 - More obedient
 - Adapt better to preschool
 - Get positive responses from peers
 - Longer, happier marriages; closer friendships
- Insecurely attached kids:
 - Exploitative, unstable, opportunistic adult relationships
 - Insecure avoidant date more, more sex without love
 - Two insecurely attached people = high conflict marriage



PARENTING

Sometimes it's just better to subdue the little bastards

Parenting Styles



Parenting Style

Parenting styles: the balance between support and control

The Permissive Parent

is highly supportive but makes few rules and trusts rather than monitors.

"I trust you'll do the right thing." The Authoritative Parent is

highly supportive AND closely monitors and sets rules.

"I care, and I'll give you the freedoms you earn; but, for safety-related issues, you'll do as I say."

The Uninvolved Parent sets few rules, does not monitor, and offers little active support.

"Kids will be kids — you'll learn from your mistakes."

The Authoritarian Parent

sets many rules and closely monitors but offers little support.

"You'll do as I say."

INCREASING SUPPORT

Cross-culturally, women invest more in children no matter how you measure investment





Cross-culturally, women invest more in children no matter how you measure investment

(Fascination with infants is almost universal among female primates)





When Do Primate Fathers Invest in Children?

*When the male has a relationship with mother

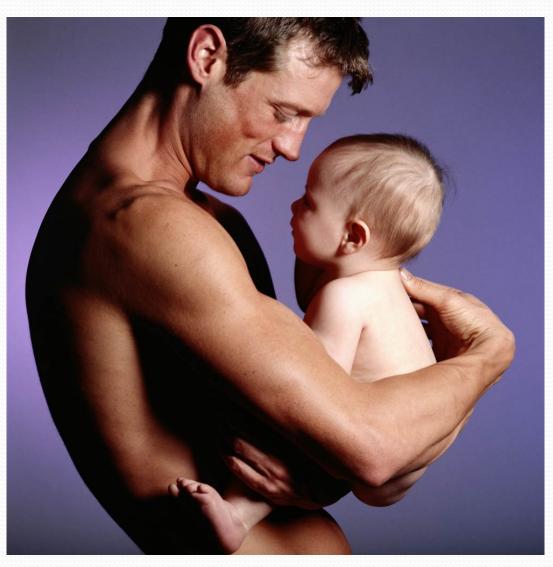
*When Confidence of Paternity is High

*When additional mating opportunities are low

*When the infant is familiar to the male

*When infant survival depends upon the father's help

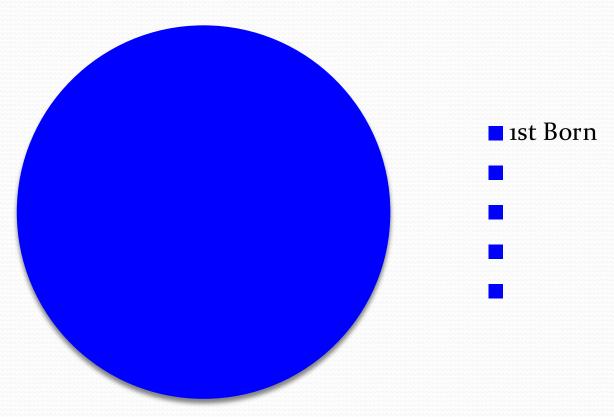
Human fathers show hormonal changes after the birth of a child

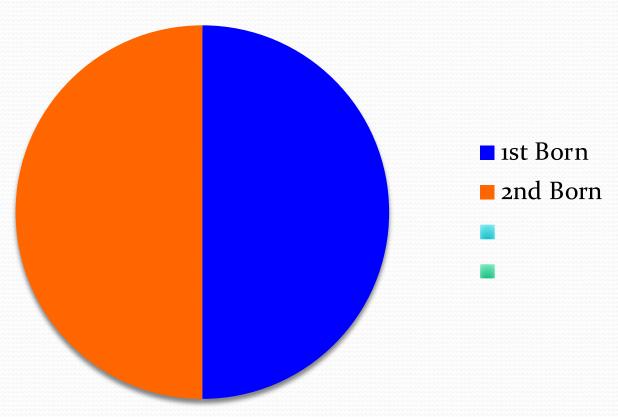


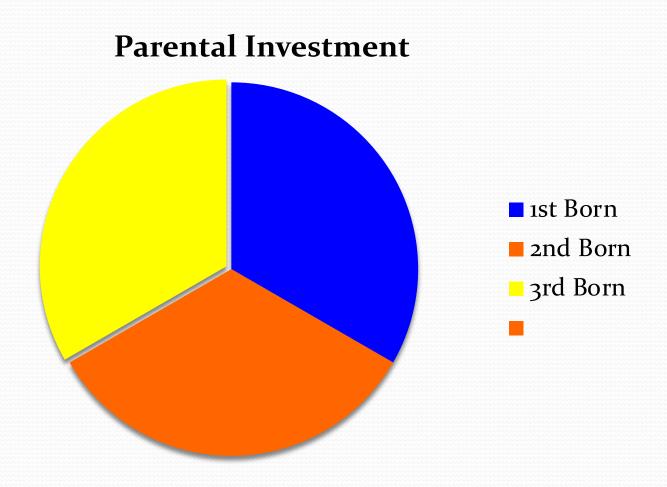
The Step-Parent "Problem"

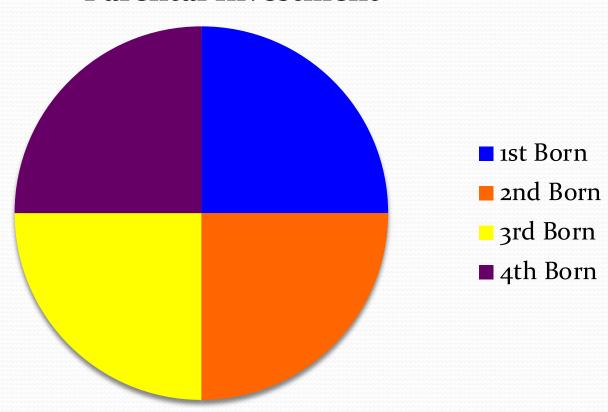


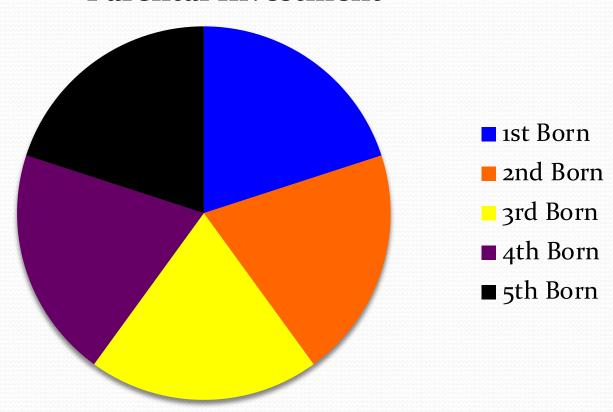


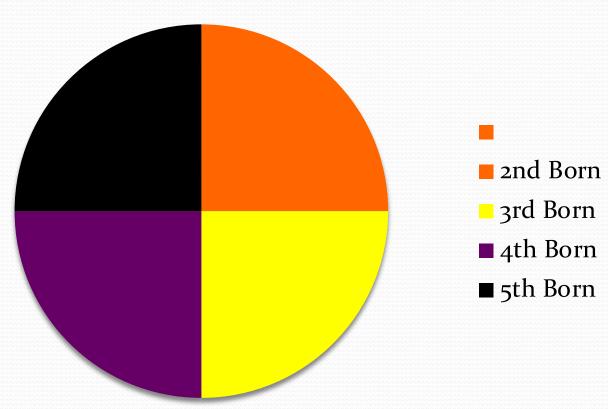


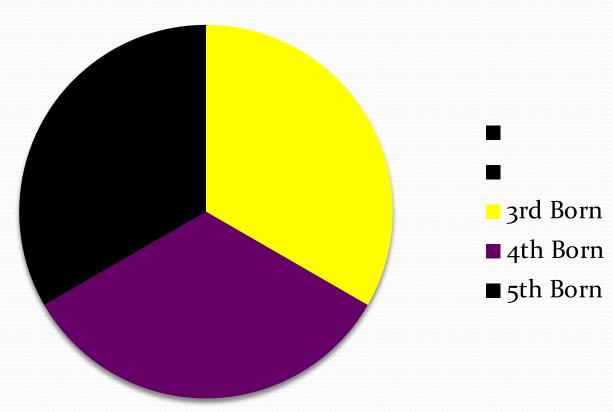


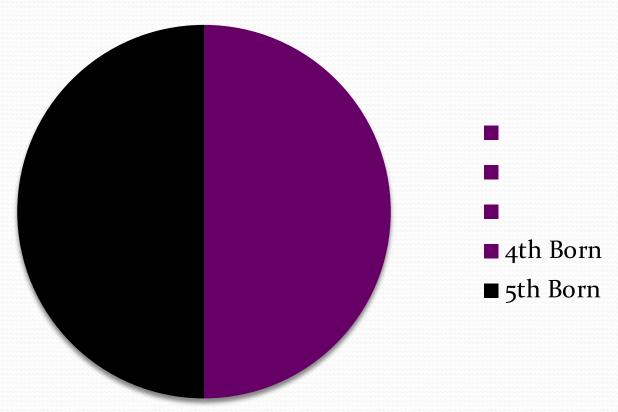


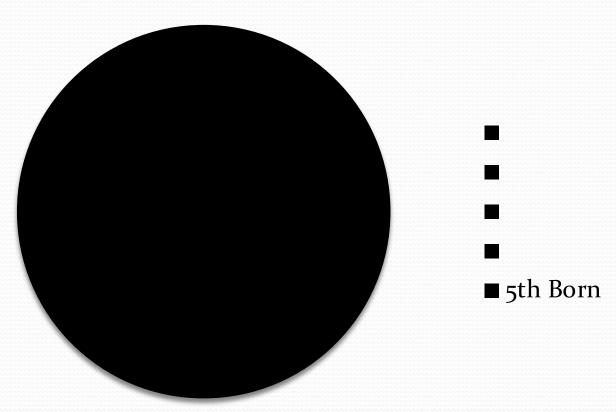












Factors that Affect Maternal Investment Decisions

*The health of the infant

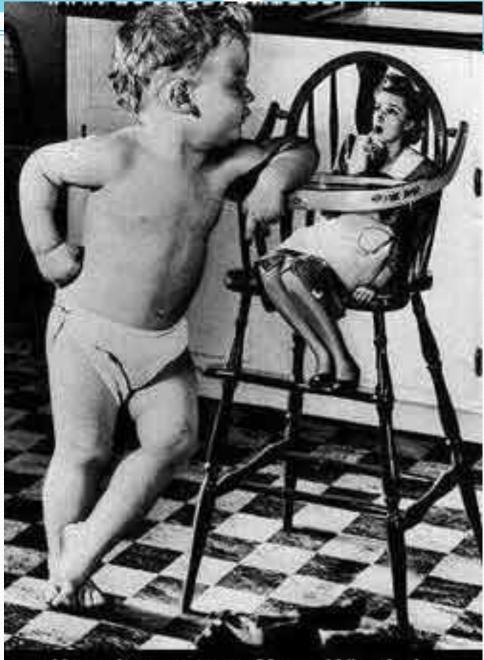
*The stability of the mother's marital status

*The reproductive value of mother (Age + Health)

*Access to resources

*Amount of social support





Now, its my turn, Mom. What's it gonna be? Strained spinach or prunes?

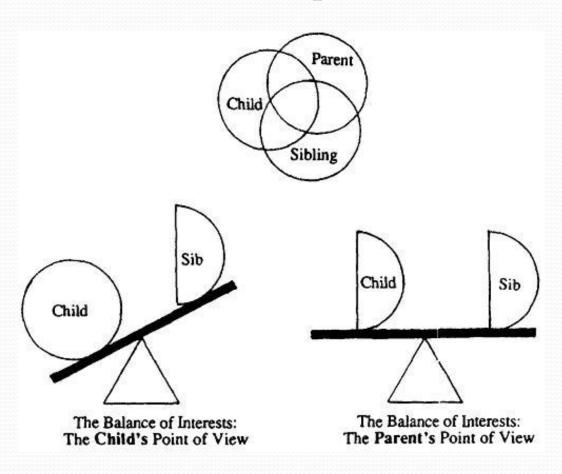
Investing in Sons versus Daughters

- The Trivers-Willard Effect
 - Does sex ratio of sons to daughters depend upon how favorable the mother's life situation is?



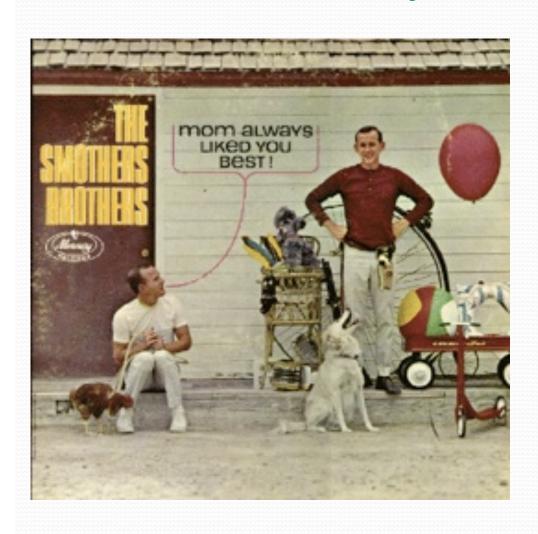
Investment as a Source of Conflict between Parents & Children

Kids want it all, parents have other agendas!



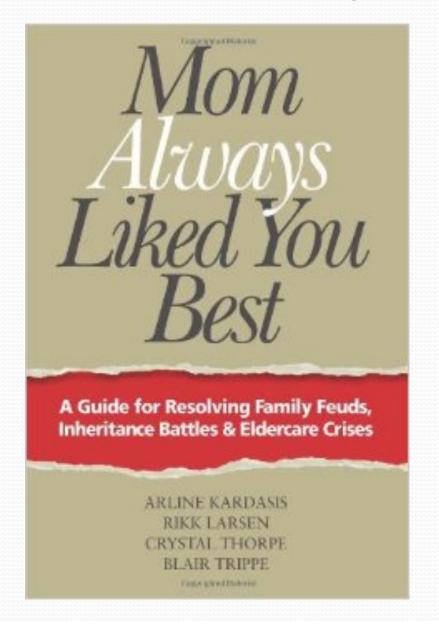


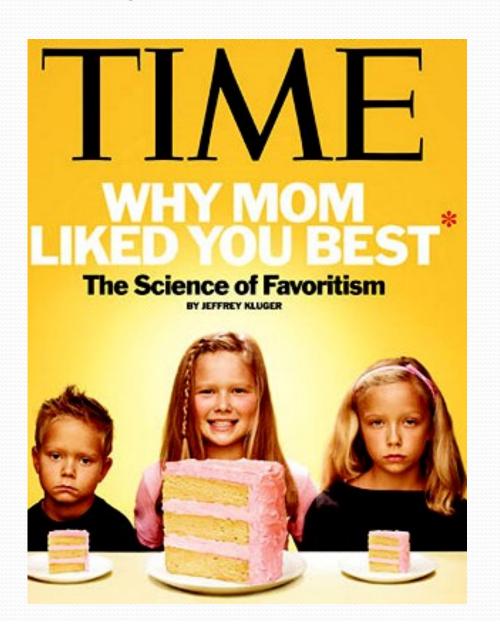
"Mom always liked you best!"





"Mom always liked you best!"





The Role of Birth Order



Birth Order & Personality



Common Characteristics of First-Borns

- More status/achievement oriented
- More responsible
- Higher educational/occupational status
- More conservative & accepting of authority
- More likely to share parents' attitudes
- More antagonistic/aggressive
- Conscientious, dominant, aggressive, ambitions, jealous, conservative

Common Characteristics of Later-Borns

- More socially successful/popular
- More expressive
- More adventurous
- Less accepting of authority
- More receptive to radical new ideas
- Lower educational achievement/aspirations
- Rebellious, underachieving, liberal, cooperative, sociable, good-natured

Sulloway's "Family Niche" Model

Principle of Divergence

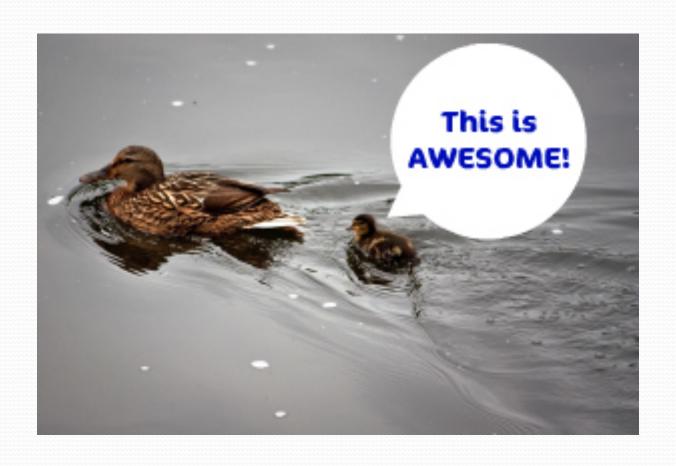


Sulloway's "Family Niche" Model

Principle of Divergence



What about Only Children? (Singletons)



Sexual Selection Revisited

- When sexes are very different on a trait/characteristic, it is a sign of sexual selection
- Sexually selected traits reflect the mating preferences of the other sex
- Sexually selected traits are usually more prominent in the males of a species, as they are usually the less investing sex
 - In humans, both are choosy because both invest a lot
- Human females are still choosier because:
 - They have smaller variance in lifetime reproductive success
 - Their costs of reproduction are higher
 - Males differ significantly in their mate value (i.e., more variable)

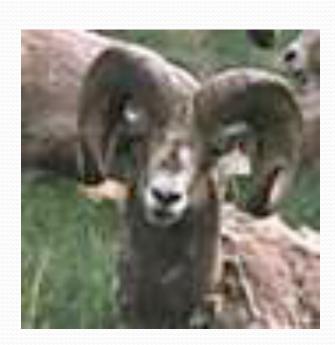
Sexual Selection for Conspicuous Male Traits



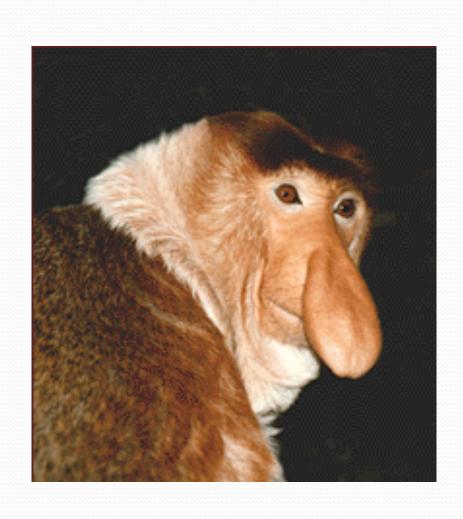


Sexual Selection for Conspicuous Male Traits





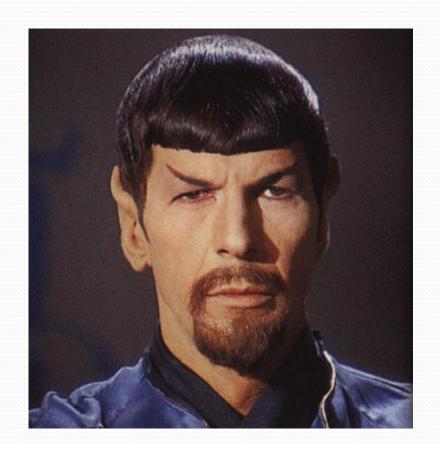
Sexual Selection for Conspicuous Male Traits





Sexually Selected Male Traits

- Genetic Quality & Resource Quality
 - Physical Traits (beards, height, voice, body build)
 - Ability & Willingness to Invest in Children
 - Risk Taking Behavior



The "Crazy-Bastard" Hypothesis

(Fessler, et al, 2014)



Content of Human Mate Preferences: Things that are Equally Valued by both Sexes

*For long-term mates, character traits become more important than attractiveness

*Preferences are sensitive to context (i.e., what can you demand?)

* Fidelity and Loyalty

*Indicators of Health, especially Symmetry & Normativity

The Importance of Fluctuating Asymmetry (FA)

- -The Best Predictor of Facial Attractiveness -Facial Attractiveness Predicts Longevity
- Indicator of Good genes

- Signal of Freedom from Disease or Environmental Damage

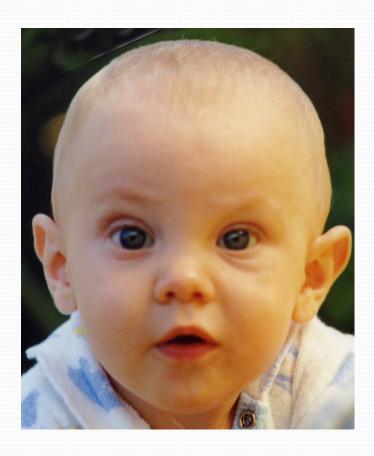
-More Symmetric Males tend to be Taller & Heavier; Opposite is

True for Females



"Play coy if you like, but no one can resist a perfectly symmetrical face."







People report emotions, personality traits, attitudes, and other characteristics to car fronts that correspond to the type of face its geometry it most resembles.

Miss Germany Finalists, 2007



Miss Germany, 2002





Virtual Miss Germany, 2002



Real vs. Virtual Miss Germany, 2002





Composite of Jerry Seinfeld's Girlfriends



Female Mate Preferences

Economic Resources or Good Financial Prospects

High Social Status

Older Men

Ambition & Industriousness

Dependability & Stability

Athletic Prowess

Tall Men

Signs of Love & Commitment

Willingness to Invest in Children

Physically Attractive Men

Ovulation Shift Hypothesis



Ovulation Shift Hypothesis

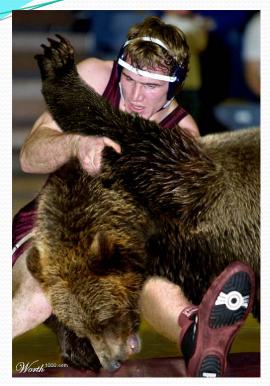


Fig. 2. From left to right: the perceived average male face (frame 394) and the attractive male faces selected by the low masculinity female participants when conception risk was low (frame 298) and when conception risk was high (frame 245). The originals were color images.



Pat Tillman

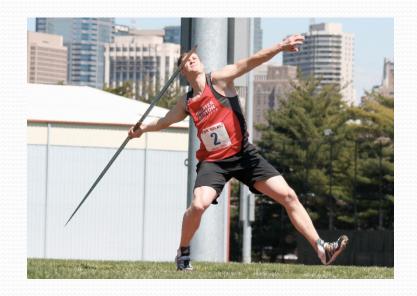
Sports as Male Display













Quote from Anthropologist Thomas Gregor (1985) on the importance of men's wrestling skills among the Mehinaku Tribe of the Brazilian Amazon:

A heavily muscled, imposingly built man is likely to accumulate many girlfriends, while a small man, deprecatingly referred to as a peristsi, fares badly. The mere fact of height creates a measurable advantage . . . A powerful wrestler, say the villagers, is frightening . . .he commands fear and respect. To the women, he is "beautiful" (awitsiri), in demand as a paramour [lover] and husband. Triumphant in politics as well as in love, the champion wrestler embodies the highest qualities of manliness. Not so fortunate the vanquished. A chronic loser, no matter what his other virtues, is regarded as a fool. As he wrestles, the men shout mock advice . . . The women are less audible as they watch the matches from their doorways, but they too have their sarcastic jokes. None of them is proud of having a loser as a husband or lover.

Male Mate Preferences

Men Always Value Physical Beauty more highly than do Women

Strong Preference for Youth

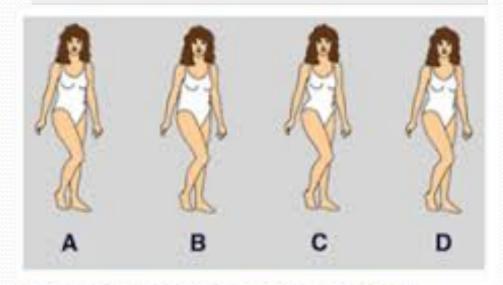
Indicators of Health & Fertility

- symmetrical face
- clear skin & eyes
- lustrous hair
- full lips
- Long Legs
- good muscle tone
- high energy level
- "immature" facial features
- Waist-to-Hip ratio of Approximately .70

Waist-to-Hip Ratio

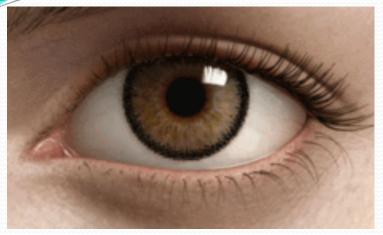


The preferred waist-to-hip ratio for women is 0.70. Research has shown that even with the downward trend in bodyweight over the past 100 years, Waist-to-Hip ratio remains constant.



The hip-to-waist ratio of female C is the most desirable to men.

Odds & Ends: Limbal Rings & Lumbar Curvature







LETTERS ON EVOLUTIONARY BEHAVIORAL SCIENCE

The Golden Years: Men From The Forbes 400 Have Much Younger Wives When Remarrying Than The General US Population

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A common stereotype is that richer men have wives who are substantially younger than themselves. However, some research suggests that large age gaps are actually more common with low male income, at least in the general population. Here, we examine spousal age differences among the super wealthy (Forbes 400 list - the richest 400 individuals in the US). Men from the Forbes 400 on average had a spouse who was seven years younger, which is significantly different from the mean age difference between spouses in the US population. Furthermore when these men remarried, their subsequent spouse was substantially younger, twenty-two years younger on average, again markedly different from the general population. Wealthy women did not differ from the general population in terms of spousal age differences. We conclude that based on these data the stereotype that rich men (re)marry younger wives holds a kernel of truth, at least for a sample of the super wealthy.

Keywords

evolutionary psychology, human mate choice, spring-autumn marriage, wealth, Forbes 400

Introduction

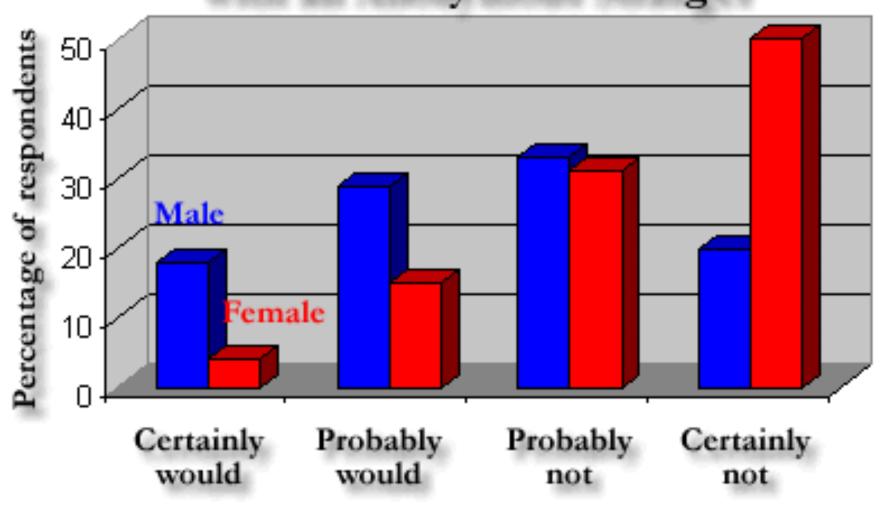
A common stereotype is that rich men have 'trophy wives', who are typically substantially younger than their husbands. One example is Donald Trump, one of America's most prominent billionaires, whose current (and third) wife is 24 years younger than him. Yet, not all billionaires adhere to this stereotype: the co-founder of Google, Sergey Brin, for example, and his wife are of the same age, both born in 1973. Although the stereotype is prevalent,

there is little systematic research documenting whether age gaps between very wealthy men and their spouses are different than for less affluent men.

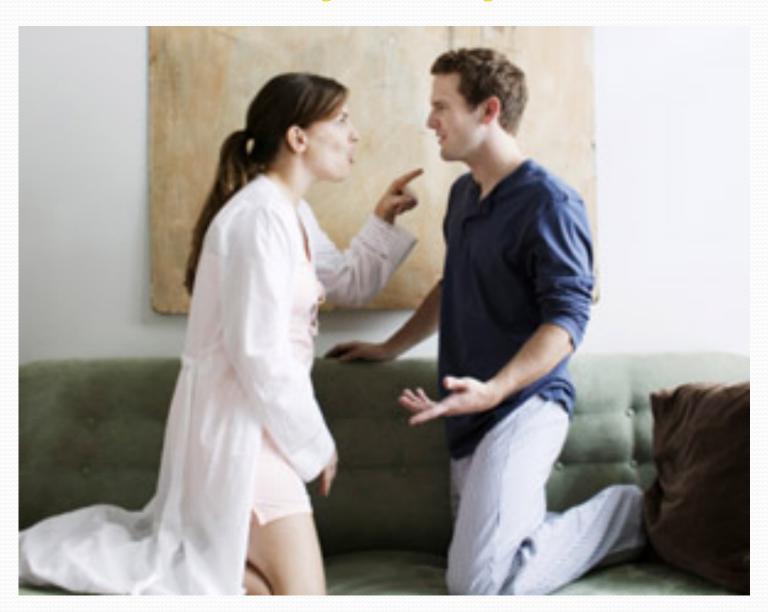
One of the earliest studies on mate preferences in social psychology, by Harrison and Saeed (1977), offers a rationale for why male wealth would predict spousal age: these authors suggest a 'trade' whereby men offer financial security and women offer youth (also see Pawlowski & Koziel, 2002). A plethora of (cross-cultural) studies do indeed show that men consider youth an important trait for a potential mate (Buss & Barnes, 1986; Buss, Shackelford, & LeBlanc, 2000; de Sousa Campos, Otta, & de Oliveira Sigueira, 2002; Dunn, Brinton, & Clark, 2010; Gil-Burmann, Peláez, & Sánchez, 2002; Greenlees & McGrew, 1994; Kenrick & Keefe, 1992; Oda, 2001; Otta, da Silva Queiroz, de Sousa Campos, da Silva, & Silveira, 1999). Evolutionary psychologists have interpreted these findings as evidence for potentially adaptive preferences in men, as youth is an important cue to female fertility, which in turn matters for male fitness (e.g., Buss & Schmitt, 1993). Hence, men should, and do, desire youthfulness in potential mates. In contrast, women seem to have no such preference and prefer men of similar age or, if anything, prefer men who are slightly older than themselves (e.g., Buunk, Dijkstra, Kenrick, & Warntjes, 2001; Dunn et al.,

Whereas female youth is a valued partner characteristic by men, male resources have been argued to be important for women's mate selection (e.g., Buss & Schmitt, 1993; Symons, 1979). Indeed, male status and income are typically listed as a preferred trait by women, especially for long-term relationships (e.g., Buss, 1989; Buunk, Dijkstra, Fetchenhauer, & Kenrick, 2002; Oda, 2001), Moreover, male financial status has been shown to positively relate to the ability to obtain a partner (e.g., Pollet & Nettle, 2008), and to proxies of male fitness (e.g., Fieder et al., 2005; Hopcroft, 2006; Nettle & Pollet, 2008). It has been suggested that (wealthy) men can increase their biological fitness by (re)marrying vounger partners (Buss, 1989; Kenrick & Keefe, 1992) and there is some evidence that wealthier men are indeed more likely to remarry (e.g., Wolf & MacDonald, 1979). Nonetheless a recent study found that in the general population males with a lower income are actually more likely to obtain a large age gap with their spouse (Mansour & McKinnish, in press; also see Vera, Berardo, & Berardo, 1985). Here we examine, among the super wealthy from the US (Forbes 400), whether the age differences between spouses is different from those observed in

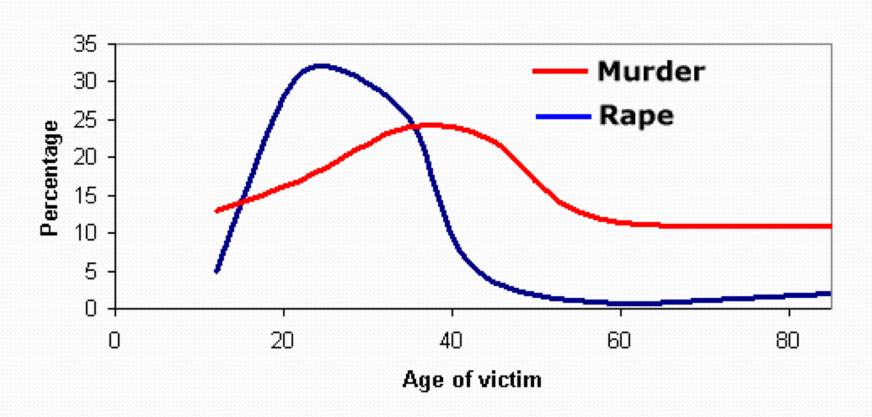
Probability of Consenting to Sex with an Anonymous Stranger

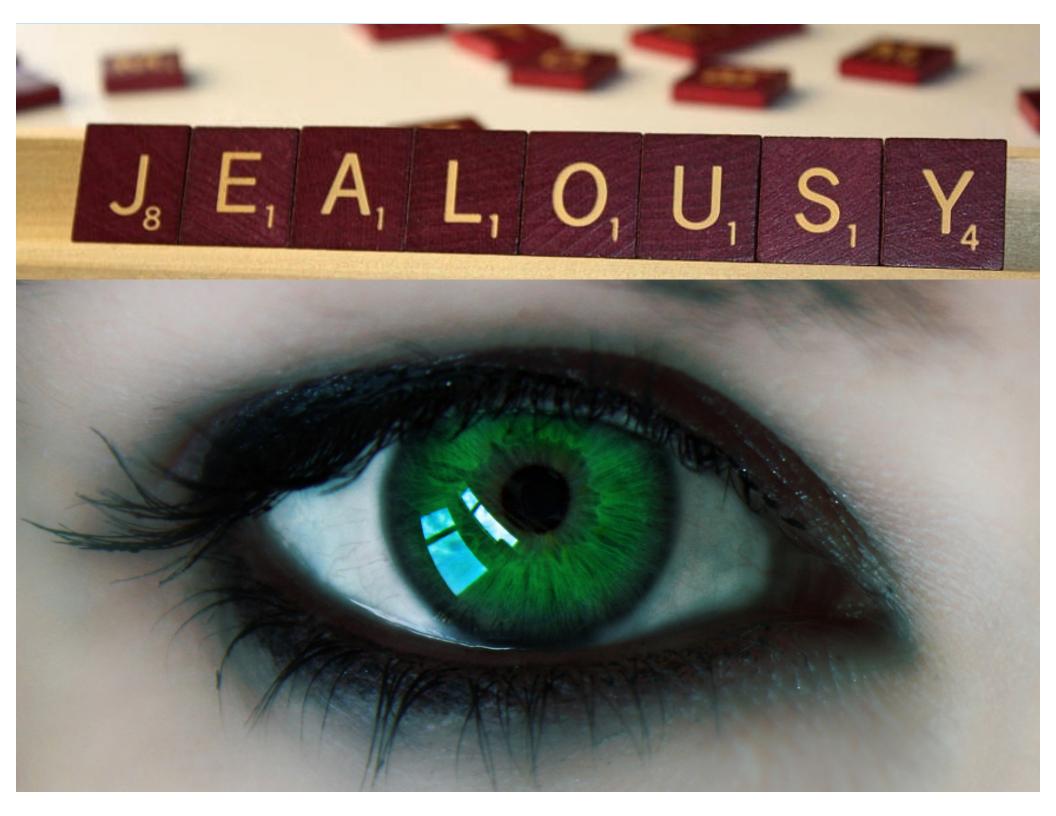


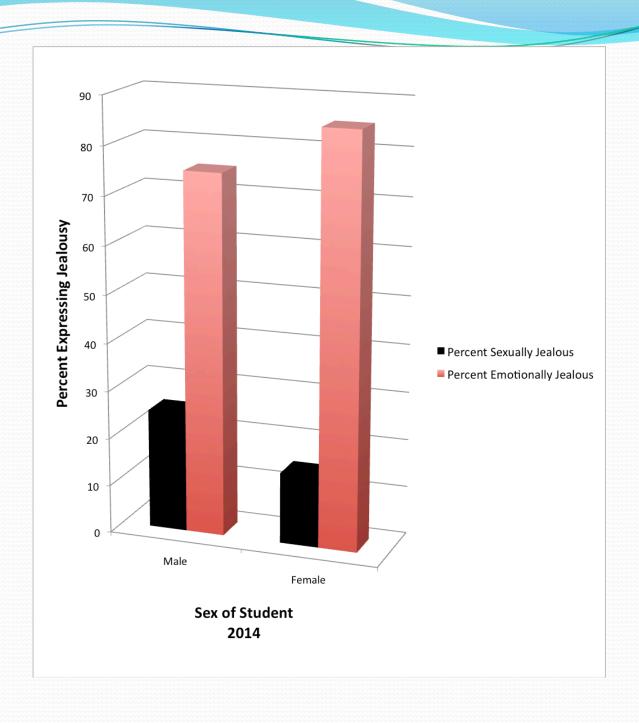
Conflicting Sexual Strategies?

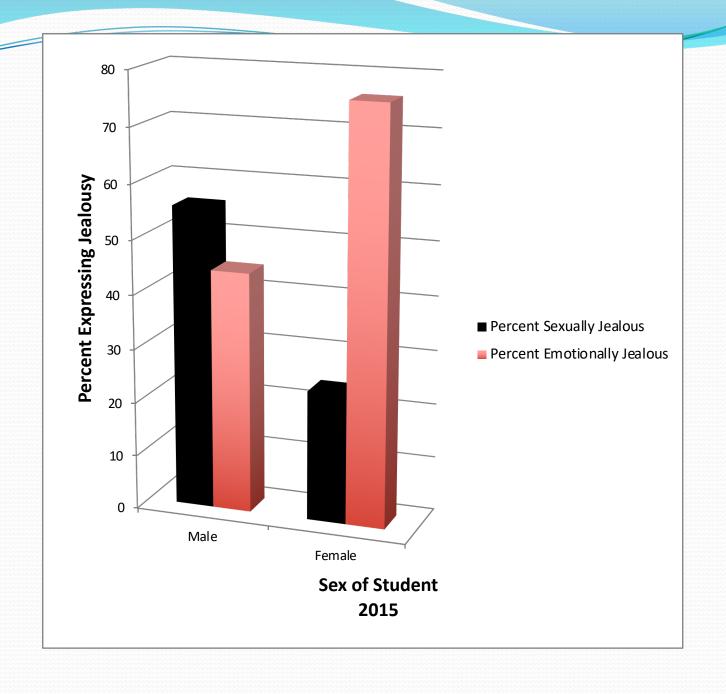


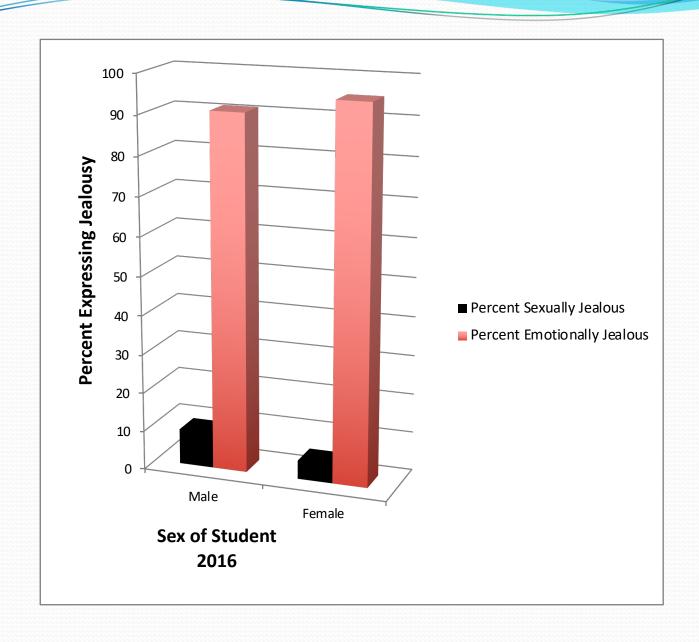
Distribution of Female Murder & Rape Victims as a Function of Age

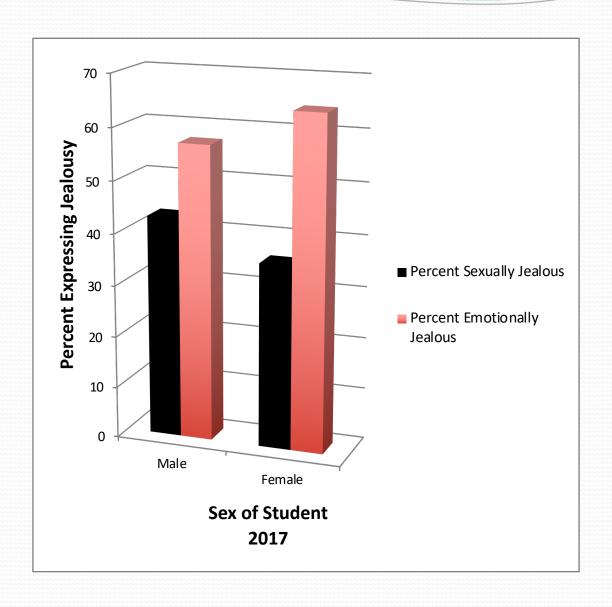


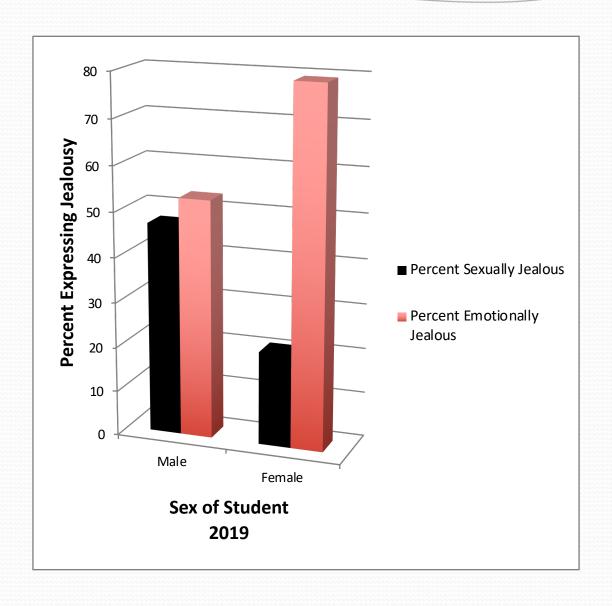








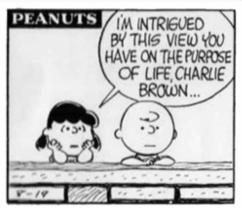




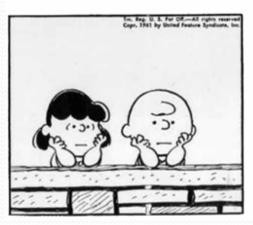
Jealousy & Mate Guarding



The Evolutionary "Problem" of Altruism











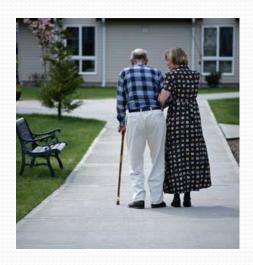
"Your too altruistic for your own good, pal - always standing up for other people's rights."

Evolutionary Perspectives on Altruism

- Kin Selection (inclusive fitness)
- Reciprocal Altruism
- Multilevel Selection Theory
- Costly Signaling/Competitive Altruism

Inclusive Fitness/Kin Selection

(W.D. Hamilton)

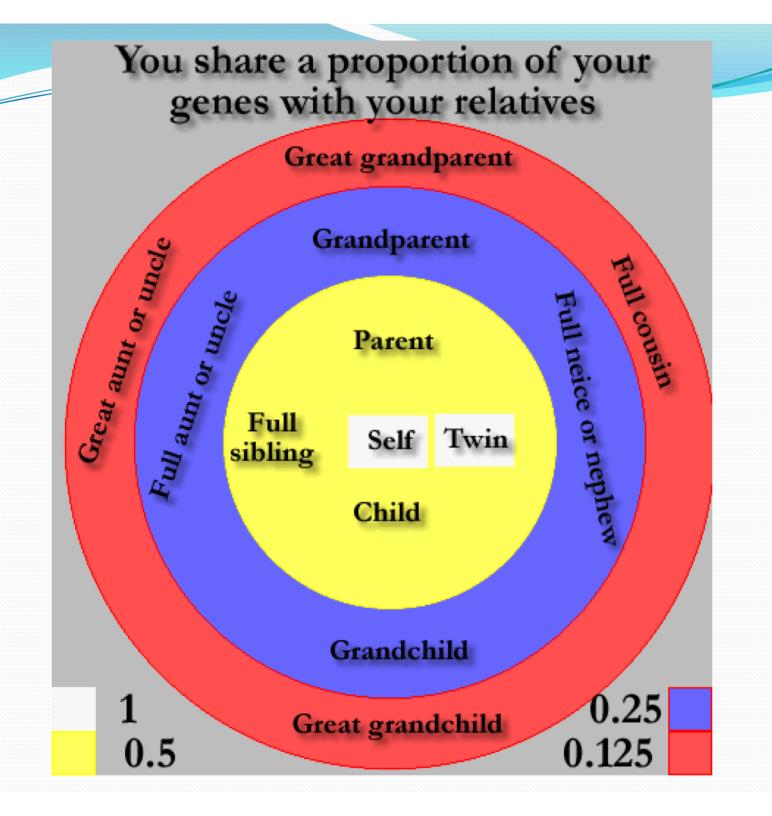












Hamilton's Rule

Genes responsible for a behavior will be successful whenever:

rb > c

r = coefficient of relatedness

b = benefit to the recipient(s)

c = cost to donor

Kin Recognition Mechanisms

-Spatial Location/Proximity

- -Familiarity Early in Life
 - -Incest Taboo/Westermarck Effect
- -Phenotypic Resemblance
- -Recognition Alleles (e.g., The Green Beard Effect)

Cultures have a "Universal Grammar" for Kin Classification

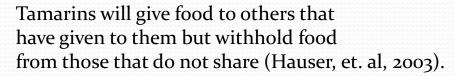
- Geneological Distance
- Rank/Age/Generation
- Group Membership (e.g., Paternal vs. Maternal)

Reciprocal Altruism (Robert Trivers)





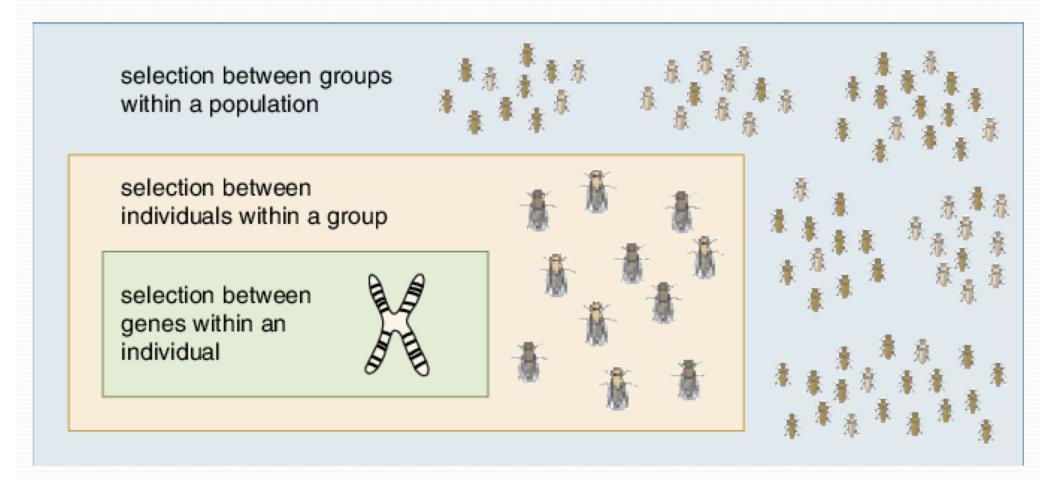






Multilevel Selection Theory

(David Sloan Wilson)



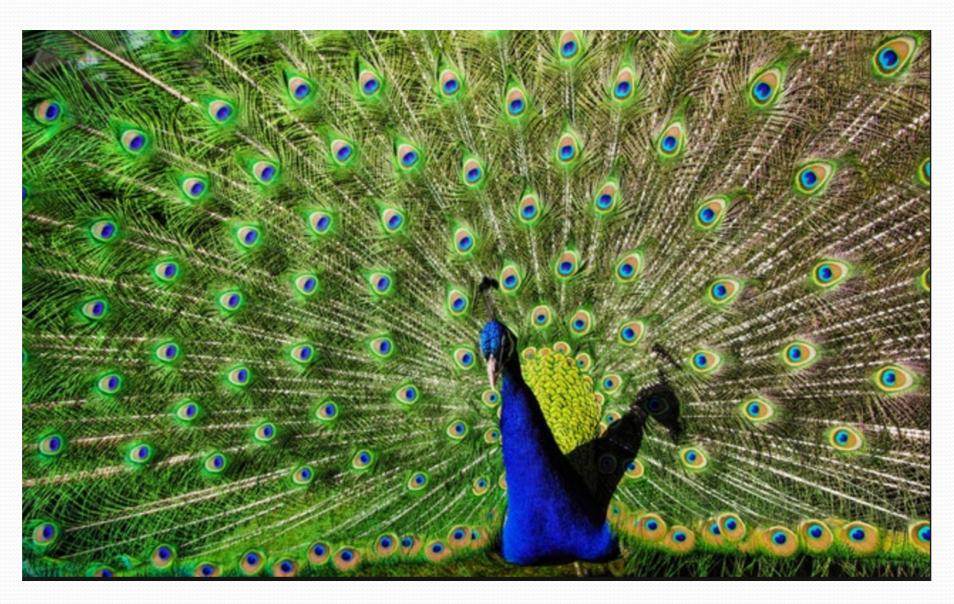
Multilevel Selection Theory

(David Sloan Wilson)



How Might a Cynical Evolutionist Explain Heroic Behavior?













What Makes a Behavior a "Costly Signal?"

*It Must be Costly to the Signaler

*It Must be Easily Observable

*It Must Increase the Odds that the Signaler Gains Some Fitness Advantage

*It Must Provide Honest Information to Observers about Important Traits/Characteristics of the Signaler

Are acts of generosity more likely to take place when they are public and easily Observable? YES! (Bereczkei, et al, 2010; Haley & Fessler, 2005)

Costly Signaling & Competitive Altruism: Do Individuals Compete to be Seen as Altruists? (and as other good things?)











What Do We Know About the Outcomes Associated with Costly Signalers?

Naturalistic Studies

(Bliege Bird, Smith, & Bird, 2001; Smith & Bliege Bird, 2000; Smith, Bliege Bird, & Bird, 2003)

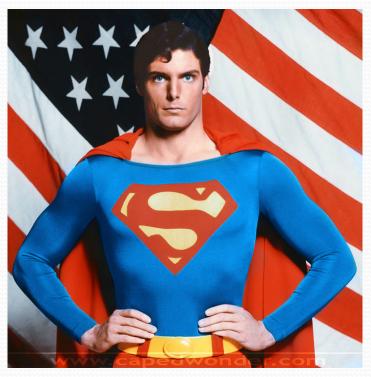
- Successful Meriam turtle hunters have higher social status, more mates, higher quality mates, more reproductive success



What Do We Know About the Outcomes Associated with Costly Signalers?

- Experimental Studies
 - (Bereczkei, et al, 2010; Hardy & Van Vugt, 2006; Willer, 2009)
 - Financial altruism in experimental games is the usual paradigm
 - Altruists are awarded more social status & respect by groups
 - Altruists are often more likely to be chosen as leaders.
 - The higher the cost of the behavior, the higher the accorded status.
 - Altruists receive more money and esteem from other group members following self-sacrifice

The Selfish Hero?



FRANKT. McANDREW

Department of Psychology

KNOX COLLEGE









What Makes Someone a "Hero?"



He puts the common good above personal concerns

He makes virtuous, moral choices

He is competent and strong

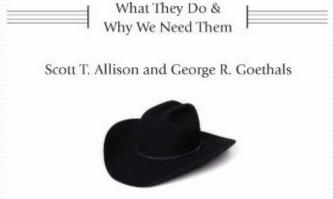
He overcomes difficult obstacles or temptations

Personal Sacrifice: He acts at great personal cost

Inspiring/Charismatic: He moves others to action; improves the quality of our lives; offers valuable lessons for living life

Often has an identifiable villain as a counterpart, especially in fiction

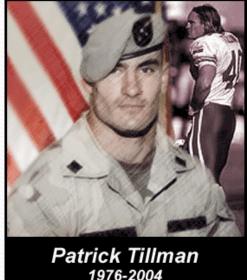
Are heroes born or made by circumstances?



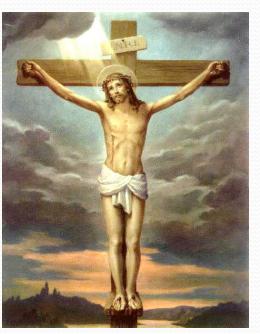
We Do Love Heroes Especially Risky, Courageous Or











Heroism as Costly Signaling

Heroic Behavior is a Display of Helpfulness, Health, Vigor, & Willingness to Act Courageously (Griskevicius, et al, 2007; Hawkes & Bird, 2002)

Bravery & Heroic Risk Taking are Preferred Traits in Males (Farthing, 2005; Kelly & Dunbar, 2001)

Hence, heroic behavior should have been selected for in males as a way of acquiring status. This should be less true for females.

What don't we know yet?

*What outcomes are experienced by "heroes" who engage in physically self-sacrificial behavior for the good of the group?

*How does the sexual composition of the group affect the behavior & outcomes of heroes?

*Is heroism primarily about male competition?

*Do personality factors predict heroic behavior, or is it entirely situational?

*Is costly signaling a viable explanation for heroic behavior?

Goals of the "Selfish Hero" Research Program

*Establish procedures for a program of laboratory studies on heroic behavior using a lifelike & involving situation.

*Obtain more data about the outcomes (for the hero) of heroic, self-sacrificial behavior in small groups.

*Study the dynamics of heroic behavior in small, same-sex groups with an eye toward differences between male and female groups.

*See if personality can be used to predict heroic behavior

*Explore the extent to which heroism is about male competition by studying Mixed-sex groups.

Study 1: What happens to heroes?

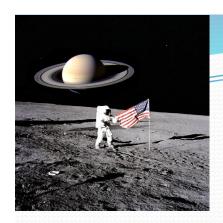
(McAndrew & Perilloux, Psychological Reports, 2012)

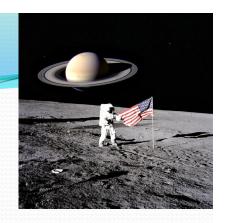
METHOD

PARTICIPANTS: 48 Undergraduates (24 male, 24 female)

PROCEDURE:

- -Three Person Same-Sex Groups (2 subjects, one confederate)
- -Study described as "group decision making"
- -If group successfully completes three tasks, group divides \$45.00
- -Group must divide tasks between "Astronaut," "Diver," & "Pitcher." (The Confederate is always the Diver)
- -After assigning roles, the group completes the three tasks.





Task #1 – Lost on the Moon

Your spaceship has just crash-landed on the lighted side of the moon. You were scheduled to rendezvous with the mother ship 200 miles away, also on the lighted surface of the moon, but the rough landing has ruined your ship and destroyed all of the equipment on board, except for the 15 items listed below. Your crew's survival depends upon reaching the mother ship, so you must choose the most critical items available for the 200 mile trip. Your task is to rank the 15 items in terms of their importance for survival . . . your group will only have 12 minutes to reach consensus on this important matter. At the conclusion of your deliberations, the individual who was chosen as the Astronaut will have five minutes to write a brief summary of the arguments in favor of keeping the top three items on your list.

Box of Matches - Food Concentrate - 50 feet of Nylon Rope - Parachute Silk Silk - Solar-Powered Portable Heating Unit - Two .45 Caliber Pistols - One case of Dehydrated Milk - Two 100 pound Tanks of Oxygen - Stellar Map of the Moon's Constellations - Self-Inflating Life Raft - Magnetic Compass - Five Gallons of Water - Signal Flares - First Aid Kit with Injection Needles - Solar Powered FM Receiver-Transmitter

Task #2 - Painful Cold-Stressor test

The Diver engaged in a cold-stressor test by immersing forearm in ice for 40 Seconds. No communication allowed during this time so as to "not distract

him/her from the pain."



Task #3 – Hitting a Target

Pitcher was given three minutes to hit a target with a ball. Hitting the target Punctured a large water balloon that then drenched the diver who was Sitting beneath it. The confederate was always the diver.





The Brave Male Confederate



The Brave Female Confederate



Study 1: METHOD (continued)

At the conclusion of the three tasks, the participants (via questionnaire) Rated all participants (including self) on seven items on seven point scales:

- perceived importance of each person's contribution to group
- willingness to work with each person in future experiment
- perceived difficulty of each person's task
- perceived costliness of each person's task
- perceived status of each individual in group
- legitimacy of considering each person the leader of the group
- how much they liked each person

They then anonymously and as individuals decided how they would like to Divide \$45.00 among the three of them. Each person received the average of What the two real subjects allocated to his/her role. The confederate was paid \$10.00 per session.

Table 1.

Means and Standard Deviations for Judgments Made about Each of the Group Roles*

RESULTS

2X2 MANOVA indicated no Main effect for sex of subject and no interaction, indicating that males and females responded similarly to playing the roles of astronaut and pitcher.

A main effect for role played indicated that pitchers & astronauts each perceived the importance of the *other* role's contribution and task difficulty to be greater.

The results in Table 1 come from single factor repeated measures ANOVAs (plus Tukey Tests).

		ROLE	
Variable	Astronaut	Diver	Pitcher
	Mean (SD)	Mean (SD)	Mean (SD)
Money Allocated	14.73 (2.85) ^A	16.73 (3.55) ^B	13.52 (2.81) ^A
Importance of Contribution	5.44 (1.69) ^A	6.31 (1.01) ^B	5.77 (1.34) ^A
Difficulty of Responsibilities	4.21 (1.50) ^A	5.79 (1.38) ^B	4.67 (1.56) ^A
Legitimacy of Leadership	5.71 (1.01) ^A	$5.00 (1.35)^{B}$	5.10 (1.19) ^B
Status	4.96 (1.17) ^A	5.42 (1.03) ^B	5.06 (1.02) ^A
Costliness of Behavior	3.15 (1.58) ^A	6.04 (1.24) ^B	3.46 (1.90) ^A

^{*}Ratings of Likeability and Willingness to Work with individual in future experiments was not included in this table, since the repeated-measures ANOVA was not an appropriate analysis for these variables. Means with different superscripted letters are significantly different from each other.

RESULTS (continued)

It did not make sense to conduct a repeated measures ANOVA on the variables of "likeability" and "willingness to work" since this would include judgments about one's self.

Paired t-tests were used to compare the Astronaut's ratings of the Pitcher & Diver on these variables and the Pitcher's ratings of the Astronaut and Diver on These variables.

Astronauts did not find Divers & Pitchers to differ in likeability, and they were Equally willing to work with both again in the future.

Pitchers were significantly more willing to work with Divers than Astronauts in The future (p. < .04) and had a tendency to like Divers more than Astronauts (p. = .057). These tendencies seemed to be especially pronounced for female pitchers.

Astronauts (p. =.018) as well as pitchers (p. = .026) gave significantly more money to Divers than to person playing the other role.

Study #1: CONCLUSIONS

*Engaging in self-sacrificial, costly behavior is a profitable long-term strategy

*Everyone had more positive reactions to the Diver, but this was especially true For Pitchers

*In this study, Astronauts, rather than Divers, were most likely to be identified as Group leaders.

*There were interesting sex differences in response to the Diver's situation.

Is Costly Signaling the Best Explanation for the Hero's Rewards?

*It is possible that what we saw in Study 1 was really reciprocal altruism; Participants were simply returning a favor.

*A second study was done to see if uninvolved individuals would make the same judgments and allocations of money.

Study 2: Reciprocal Altruism?

(McAndrew & Perilloux, Psychological Reports, 2012)

- 334 undergraduates (160M, 174F) from UT Austin
- Asked to imagine that they had just observed an experiment
- Participants read a description of the procedures from Study 1, rated the three hypothetical group members, and allocated \$45.00 among the three group members.
- They also guessed whether males or females would be more likely to volunteer for each of the roles, and how interested they themselves would be in playing each role.
- Thus, uninvolved individuals who received no benefit from the hero performed the evaluations.

Study 2: Results

(2 (sex) X 3 (role – repeated measure) ANOVA & Tukey HSDs)

Overall females gave higher ratings to everyone, But no sex differences in allocation of money

No interactions of subject sex with repeated measures variable

Divers received significantly more money; were more likeable; Engaged in more difficult & costly behavior; Made greater contribution to success of group

Astronauts had higher status and were more likely To be seen as leaders

Subjects generally made harsh judgments about pitchers

Subjects thought men would be more likely to become divers and women would be more likely to become astronauts; this was also reflected in their own preferences

Means and Standard Deviations for Judgments Made about Each Group Role in Study 2 (Repeated Measures)

		ROLE	ROLE	
Variable	Astronaut M (SD)	Diver M (SD)	Pitcher M (SD)	
Money Allocated	14.09 (5.94) ^A	20.12 (6.19) ^B	10.80 (4.20) ^c	
Importance of Contribution	4.91 (1.50) ^A	5.79 (1.60) ^B	4.75 (1.67) ^A	
Difficulty of Responsibilities	3.91 (1.58) ^A	6.02 (1.33) ^B	4.43 (1.53) ^c	
Legitimacy of Leadership	5.30 (1.61) ^A	4.42 (1.58) ^B	3.43 (1.45) ^C	
Status	5.17 (1.39) ^A	4.88 (1.57) ^B	4.07 (1.45) ^C	
Costliness of Behavior	3.47 (1.82) ^A	5.77 (1.30) ^B	3.66 (1.72) ^A	
Willingness to Work with Person In Future	5.09 (1.41) ^A	5.39 (1.41) ^B	4.42 (1.34) ^C	
Likeability	4.55 (1.37) ^A	4.91 (1.36) ^B	4.07 (1.35) ^C	

Note: Means with different superscripted letters are significantly different from each other.

Study 2: Conclusion

- Since the results of Study 2 closely parallel those of Study 1
 - And since the participants in Study 2 had not benefited from the hero's behavior
 - Reciprocal altruism does NOT seem to be a likely explanation for the results of Study 1

What Role Might Personality Play in Heroic Altruistic Behavior?

- We perceive altruism/cooperativeness as a stable trait
- We can indentify altruistic individuals at better than chance level from a brief 20s video clip (Fetchenhauer, et al, 2010)
- However, there are problems with assessing prosocial personality traits too directly:
 - Easy to manipulate by non-altruists
 - Susceptible to self-serving biases of well-intentioned individuals

Do Personality Traits Predict Heroic Behavior?

• Would it be possible to develop a "Hero Scale?"

		56%			
Stability 11			Romantic	шишиш	63%
	111111111111	60%	Avoidant	шишшшш	63%
Orderliness	Ш	26%	Anti-authority	шишшшш	70%
Empathy	ШШ	36%	Wealth	ШШ	23%
Interdependence	ШШШ	43%	Dependency	ШШ	30%
Intellectual	шишишиш	83%	Change averse	ШШШ	43%
Mystical	ШШШШ	70%	Cautiousness	ШШШШ	56%
Artistic	шишиши	76%	Individuality	шишшш	63%
Religious	ШШШ	43%	Sexuality	шишшш	63%
Hedonism	ШШ	36%	Peter pan complex	шишишиш	76%
Materialism	ШШШ	43%	Physical security	шшшшш	70%
Narcissism	ШШ	36%	Food indulgent	шишшш	63%
Adventurousness	ШШ	36%	Histrionic	ШШШ	50%
Work ethic	ШШШ	43%	Paranoia	ШШШШ	56%
Self absorbed	ШШШ	56%	Vanity	ШШШ	43%
Conflict seeking	ШШШ	50%	Hypersensitivity	ШШШШ	50%
Need to dominate	ШШШ	50%	Female cliche	шшшш	56%



Development of the Hero Scale

(McAndrew & Perilloux, Annual Meeting of the Human Behavior and Evolution Society, Montpellier, France, 2011)

- 645 U of Texas undergraduates (304M, 339F)
- 74 original items: some original, some adapted from many other scales
- Each item was a statement that participants express agreement with on a 1(SD) to 5(SA) scale.
 - Example: I usually feel as if I am the only person I can depend upon
- Reduced through a series of Factor Analyses to Six independent subscales (Factor Loadings >.50)

The Six Factors of the Hero Scale

(Cronbach's Alpha range: low of .56 for sense of duty to a high of .80 for social inhibition)

- Social Inhibition (9 items)
 - Feeling self-conscious/embarrassed/inhibited in public
- Sense of Duty (4 items)
 - Feeling responsible for fulfilling obligations to others
- Cynicism (5 items)
 - Thinking the worst of fellow humans & not trusting them
- Sensation Seeking (5 items)
 - Seeking out and enjoying exciting situations
- Glory Seeking (4 items)
 - Fantasizing about fame, glory, recognition by others
- Activism (3 items)
 - Frequency of volunteering

Is Heroism Primarily a Male Thing?

"Showing off" is a common male strategy for advertising genetic quality & Prosocial personality traits valued by prospective mates (Hawkes, 1991; Iredale & Van Vugt, 2009)

Males are more likely to display altruism in the presence of attractive members of the opposite sex; females do not do this (Farrelly, Lazarus, & Roberts, 2007; Iredale, Van Vugt, & Dunbar, 2008)

Heroic Behavior is a Display of Helpfulness, Health, Vigor, & Willingness to Act Courageously (Griskevicius, et al, 2007; Hawkes & Bird, 2002)

Bravery & Heroic Risk Taking are Preferred Traits in Males (Farthing, 2005; Kelly & Dunbar, 2001)

Hence, heroic behavior should have been selected for in males as a way of acquiring status. This should be less true for females.

Heroism and the "Challenge Hypothesis"

PREDICTION: Self-Sacrificial Heroic behavior should be MOST likely to occur when males have the opportunity to show off by competing directly with other males for status.

WHY?

According to the "Challenge Hypothesis" (Wingfield, et al, 1990):

- Testosterone levels increase in response to threats to status or pending competition with other males.
- This has been used primarily to explain human male aggressive behavior (Archer, 2006; McAndrew, 2009), but should explain other competitive responses, such as heroism.

Thus, heroism is not just a "male thing," but more specifically it is about Male competition.

Study 3: Who Becomes a Hero in Mixed-Sex Groups? (and what happens to them?): Predictions (McAndrew & Perilloux, 2012, Evolutionary Psychology)

- *Males should be more likely to play "heroic" roles in groups than females.
- *The tendency for males to play heroic roles should be amplified in groups With more than one male present.
- *Personality traits that are predictive of heroic behavior should be more salient in males.
- *At the end of the experiment, heroic group members should have attained higher status and be allocated more money than non-heroic group members.

Study 3: METHOD

PARTICIPANTS: 78 Undergraduates (39 male, 39 female)

PROCEDURE:

- -Three Person Mixed-Sex Groups (13 2M1F; 13 1M2F)
- -Study described as "Personality & group decision making"
- -Participants filled out a 30 item "Hero Personality Scale"
- -If group successfully completes three tasks, group divides \$45.00
- -Group must divide tasks between "Astronaut," "Diver," & "Pitcher."
- -After deciding roles, the group completes the three tasks.

Study 3: METHOD (continued)

At the conclusion of the three tasks, the participants (via questionnaire) Rated all participants (including self) on seven items on seven point scales:

- perceived importance of each person's contribution to group
- willingness to work with each person in future experiment
- perceived difficulty of each person's task
- perceived costliness of each person's task
- perceived status of each individual in group
- legitimacy of considering each person the leader of the group
- how much they liked each person

They then anonymously and as individuals decided how they would like to Divide \$45.00 among the three of them. Subjects were not allowed to simply do a Three-way even split of the money, and each person received the average of What the three subjects allocated to his/her role.

Study 3: RESULTS: Sex Differences in Role Assignments

- In Groups of 2 females and 1 Male, distribution of males & females across roles did not differ from what would expected by chance (X²(2) = 1.62, p. > .05)
- In Groups of 2 males and 1 female, there was a significant deviation from chance (X²(2) = 30.69, p. < .0001)
 - In only 1 of 13 groups did a male become an astronaut
 - In only one of 13 groups did a female not become an astronaut
 - No female in these groups ever became a diver

Study 3 Results: Allocations of Money

2 (sex of Subject) X 3 (Role played by Subject) MANOVA: No significant main effects or Interactions. (p. > .05)

A repeated measures ANOVA revealed a Significant main effect of role played on money received, F(2, 143) = 20.65, p. < .0001.

Tukey tests revealed that divers (\$17.72) received more on average than did Astronauts (\$13.10) or pitchers (\$13.92).

Separate analyses for males (F(2, 67) = 21.50, p. < .0001) & females (F(2, 63) = 4.50, p. < .02) Showed the same pattern.

Table 1.

Means and Standard Deviations for Monetary Allocations as a Function of Group Role
and Sex of Subject

		ROLE PLAYED BY SUBJECT		
		Astronaut	Diver	Pitcher
		Mean (SD)	Mean (SD)	Mean (SD)
Money Allo By sex of so				
To Astrona Mal		\$10.75 (5.91)	\$13.29 (3.50)	\$12.06 (2.26)
Fem	ales	\$14.50 (6.35)	\$13.56 (2.30)	\$11.88 (3.56)
To Diver				
Mal	es	\$20.00 (3.74)	\$18.35 (4.70)	\$18.17 (3.60)
Fem	ales	\$16.82 (3.91)	\$17.11 (2.89)	\$17.37 (4.31)
To Pitcher				
Mal	es	\$14.25 (2.63)	\$13.35 (2.71)	\$13.94 (3.89)
Fem	ales	\$13.68 (3.37)	\$13.78 (2.33)	\$15.75 (5.92)

Study 3 Results: Analysis of Interpersonal Ratings

- Repeated measures ANOVA for judgments comparing astronauts, divers, and pitchers on the following variables:
 - Importance of contribution to success of group
 - How challenging the task was
 - How legitimate for person to be leader of group
 - Status in group
 - Costliness of behavior

Study 3 Results: Analysis of Interpersonal Ratings

Contribution to Group: Divers >Pitchers >Astronauts (F(2, 145) = 23.30, p. < .0001

How challenging was task? Divers >Pitchers >Astronauts F(2, 152) = 73.21, p. < .00001

Costliness of behavior Divers >Pitchers >Astronauts F(2, 140) = 128.18, p. < .00001

Legitimacy of being a leader: No differences, F(2, 150) = 1.83, p. > .05

Status: No Differences F(2, 152) = 1.63, p. > .05

Table 2.

Means and Standard Deviations for Judgments Made about Each of the Group Roles*

		ROLE	
Variable	Astronaut Mean (SD)	Diver Mean (SD)	Pitcher Mean (SD)
Ioney Allocated	13.10 (4.36) ^A	17.72 (3.93) ^B	13.92 (3.53) ^A
mportance of Contribution	4.82 (1.33) ^A	5.83 (1.02) ^B	5.37 (1.27) ^C
ifficulty of esponsibilities	3.62 (1.22) ^A	5.50 (1.29) ^B	4.91 (1.21) ^C
egitimacy of eadership	4.95 (1.28) ^A	4.44 (1.25) ^A	5.03 (1.51) ^A
atus	4.60 (0.96) ^A	4.86 (1.11) ^A	4.83 (1.04) ^A
ostliness of ehavior	2.71 (1.47) ^A	5.83 (1.33) ^B	3.23 (1.70) ^c

Study 3 RESULTS:

Analysis of Interpersonal Ratings

It did not make sense to conduct a repeated measures ANOVA on the variables of "likeability" and "willingness to work" since this would include judgments about one's self.

Independent sample t-tests were used to compare the judgments made about One role by the other two roles. For example, only judgments made by pitchers And divers about the likeability of astronauts were compared.

There were no significant difference in the judgments made about likeability Or on willingness to work with someone in future studies. Thus, the role played By someone did not influence judgments about the other group members.

Exploratory t tests looking at sex differences revealed that male divers perceived That divers had higher status than did female divers, t (24) = 2.30, p. < .03.

Study 3 Results: Analysis of Personality Variables

- Cronbach Alpha measures of reliability for "sense of duty" and "activism" were so poor that these factors were not analyzed.
- MANOVA analyses on the remaining factors revealed the following:
 - Females scored higher than males on Social Inhibition, F(1, 72) = 7.13, p. < .009.
 - Males scored higher than females on glory seeking, F (1, 72) = 20.64,
 p. < .0001.
 - Male divers & pitchers scored higher on sensation seeking (F (2, 72) = 4.11, p. < .02) and glory seeking (F (2, 72) = 6.30, p. < .003) than male astronauts.
 - No female personality scores were different across roles (p. > .05)

Study 3: CONCLUSIONS

*Engaging in self-sacrificial, costly behavior is a profitable long-term strategy

*Personality traits pertinent to heroism were better predictors of male than of female Behavior.

*"Glory Seeking" and conscious striving for status seem to be the primary motives Of our "heroes."

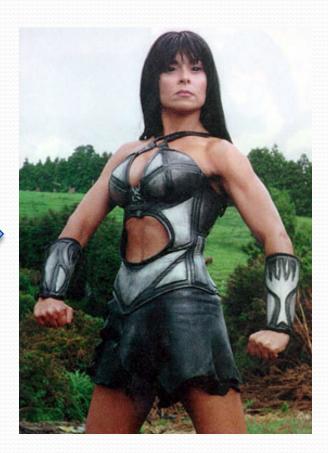
*The presence of another male triggers competitive status-seeking behavior, Indicating the relevance of the Challenge Hypothesis to altruistic behavior.

Study 4: What about Heroism in Same Sex Groups?

(Beginning with Females)

(McAndrew & Perilloux, 2010; *Annual Meeting of the Human behavior and Evolution Society*, Eugene, Oregon)





Study 4: METHOD

PARTICIPANTS: 39 Female Undergraduates

PROCEDURE:

- 13 Three Person Female Groups
- -Study described as "personality & group decision making"
- -If group successfully completes three tasks, group divides \$45.00
- -Subject begins by filling out the Hero Scale
- -Group must divide tasks between "Astronaut," "Diver," & "Pitcher."
- -After assigning roles, the group completes three tasks.

Study 4: METHOD (continued)

At the conclusion of the three tasks, the participants (via questionnaire) Rated all participants (including self) on seven items on seven point scales:

- perceived importance of each person's contribution to group
- willingness to work with each person in future experiment
- perceived difficulty of each person's task
- perceived costliness of each person's task
- perceived status of each individual in group
- legitimacy of considering each person the leader of the group
- how much they liked each person

They then anonymously and as individuals decided how they would like to Divide \$45.00 among the three of them. Each person received the average of What the three subjects allocated to her role.

Study 4: RESULTS Allocation of Money

A one-way MANOVA indicated a near significant effect (p. = .061) of a person's role on the amount allocated. Due primarily to astronauts giving more money to divers & divers giving more money to pitchers.

A repeated measures ANOVA and Tukey tests revealed that divers on Average received significantly more (p. < .0001) Than astronauts (\$17.36 vs. \$13.33) And pitchers (\$17.36 vs. \$14.72).

Table 1.

Means and Standard Deviations for Monetary Allocations as a Function of Group Role

		ROLE	ROLE	
Variable	Astronaut Mean (SD)	Diver Mean (SD)	Pitcher Mean (SD)	
Money Allocated To Astronaut	\$13.08 (3.33)	\$13.08 (2.40)	\$13.85 (1.35)	
Money Allocated To Diver	\$18.85 (4.10)	\$16.38 (2.36)	\$16.85 (1.46)	
Money Allocated To Pitcher	\$14.31 (2.10)	\$15.54 (1.05)	\$14.31 (1.44)	

Study 4 RESULTS: Likeability & Willingness to Work Together in Future Experiments

It did not make sense to conduct a repeated measures ANOVA on the variables of "likeability" and "willingness to work" since this would include judgments about one's self.

Paired t-tests were used to compare the Astronaut's ratings of the Pitcher & Diver on these variables, the Pitcher's ratings of the Astronaut and Diver on These variables, and the Diver's ratings of the Astronaut and Pitcher.

Pitchers were equally well liked by astronauts and divers, but divers were Significantly more likely to want to work with them again (p. < .04).

Pitchers and Astronauts were equally willing to work with divers again, but pitchers Liked them significantly more (p.< .02).

There was no difference between pitchers and divers in their response to Astronauts on these two variables.

Study 4 RESULTS: Other Interpersonal Ratings

Repeated measures ANOVAs & Tukey Tests assessed ratings on 5 dimensions.

Pitchers & Divers were perceived To have made greater contributions To group success and their tasks were perceived as more challenging (p. < .0001).

Divers had higher status than Astronauts (p. < .001).

Diver's behavior was more costly than Pitcher's who in turn was more costly Than Astronaut's (p. < .0001).

No differences in perceived Legitimacy of leadership.

Table 2.

Means and Standard Deviations for Judgments Made about Each of the Group Roles*

		ROLE	
Variable	Astronaut Mean (SD)	Diver Mean (SD)	Pitcher Mean (SD)
Money Allocated	13.33 (2.45) ^A	17.36 (2.99) ^B	14.72 (1.65) ^A
Importance of Contribution	5.05 (1.56) ^A	5.97 (1.17) ^B	5.92 (1.15) ^B
Difficulty of Responsibilities	3.53 (1.47) ^A	5.03 (1.57) ^B	5.03 (1.24) ^B
Legitimacy of Leadership	4.97 (1.46) ^A	5.47 (1.29) ^A	4.95 (1.06) ^A
Status	4.50 (1.13) ^A	5.21 (1.07) ^B	4.92 (0.75) ^{A&B}
Costliness of Behavior	2.47 (1.41) ^A	5.37 (1.63) ^B	3.18 (1.41) ^c

^{*}Ratings of Likeability and Willingness to Work with individual in future experiments was not included in this table, since the repeated-measures ANOVA was not an appropriate analysis for these variables. Means with different superscripted letters are significantly different from each other.

Study 4 RESULTS: Personality Effects

- The Cronbach's Alpha for two of the six subscales were low.
- MANOVA comparing Astronauts, Divers, & Pitchers on the six subscales indicated no significant differences among them (F (12, 64) = .81, p. > .05).
- Even if we cheated and looked at univariate F's, the only effect was that Divers scored significantly higher than others on the Glory Seeking Scale (F (2, 36) = 3.16, P. < .05).

Study 4: CONCLUSIONS

*Engaging in self-sacrificial, costly behavior is a profitable long-term strategy

*Pitchers and Divers had especially positive reactions to each other

*The personality variables that we measured did not add anything to the prediction of heroic behavior or the allocation of money.

*Our subjects were generally quite unselfish!

Study 5: Heroism in All Male Groups



STILL IN PROGRESS!

General Conclusions

- Heroes do in fact get rewarded, both materially & psychologically
 - Assignment of Status & Leadership was unstable across studies
- Costly Signaling appears to be the most likely explanation
- Heroism Appears to be Primarily a "Male Thing"
 - Triggered by the presence of another male + a female
 - Glory seeking and status striving seem relevant
- Personality is a relatively weak predictor, but better for males than females

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Thanks to my collaborator and coauthor Dr. Carin Perilloux, Knox '05 & University of Texas – Austin (Ph.D., 2011). She is currently at Southwestern University.

Thanks to Nicole Morgan, '08, for data analysis, pilot study, and assorted other help.

Thanks to my confederates, Tim Rairdon, '08 & Linda Kelahan, '07

Proximate Causes of Aggression

- Pain or Frustration
- Heat
- Harsh Childhood
- Presence of Aggressive Cues
- Alcohol
- Exposure to Aggressive Models
- Personality Traits such as Narcissism & Type A Personality Patterns

Biological Influences on Aggression

Twin studies show a strong genetic link, possibly accounting for 50% of interpersonal variability

Hormone levels, especially testosterone, are linked to aggressiveness in humans *and* animals

Lab & Field studies reveal positive relationship between testosterone and Levels of restlessness, tenseness, and a tendency toward violence.

In human males, testosterone levels rise and fall with winning and losing in competition. (Also occurs among spectators)

Symmetrical males tend to be more aggressive than non-symmetrical Males, Possibly due to different hormone levels during prenatal development.

The "Challenge Hypothesis" suggests that testosterone spikes following challenge to status or impending competition with other males.

How might natural selection shape a capacity for violence?



It should show up most frequently in situations that pose a risk to reproductive fitness:

Competition for resources, status, & mates

As a response to sexual infidelity

Sex Differences in Aggression



Sex Differences In Aggression: Some Examples

- Organized fighting and killing by women does not exist, and there is no evidence that it ever has.
- Males are more likely to engage in aggressive fantasy
- Males are more likely to think about the outcome of possible fights with other men that they know
- Females are most likely to be killed by husbands/boyfriends
- Males are most likely to be killed by other men
- Male-to-male aggression is the most common form of violence everywhere
- Men commit 85% of all homicides, and are also the most frequent victims
- Male homicides account for 91% of all same-sex homicides crossculturally; 97% in cases where killer and victim are not related.
- Almost all murders committed in families are committed by men; The exceptions make the national news

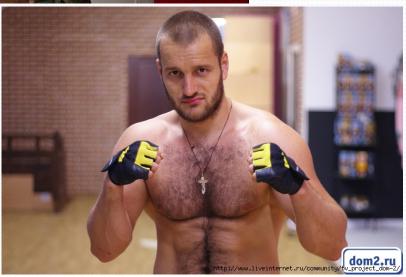
WHY Such Sex Differences?

- Different strategies were adaptive for men & women
- Powerful men enjoyed greater access to women
- Social Status dependent upon how believable threats of physical violence were
- Quest for dominance became a strong motivation
- Achievement of dominance became highly satisfying
- Violence against the right people at the right time was a ticket to social success for men.

Precarious Manhood

(and the importance of saving face)







Precarious Manhood

 Manhood is a status that must be continually earned by proving one's self worthy of being thought of as a "real man." What makes it "precarious" is the fact that it can be so easily lost again if the man fails to measure up to the relentless challenges that life will continue to throw at him.

For human males, a drive to strive for status became essential

- Research confirms that males score higher on status striving than females (Buss, 2015)
- Humans compete with each other to be attended to by others status, reputation, & prestige are reflections of this; (Gilbert, 1990, 2000)
- Going up or down in rank induces mood altering hormonal changes & influences self-esteem
 - Rage, envy, shame, social anxiety, depression

In the words of Jonathan Gottschall (p. 205 - Professor in

the Cage: Why men fight, and why we like to watch

 "To physically dominate another man is intoxicating."

Precarious Manhood



Mass shooters are almost never "Alpha Males"



Mass shooters are almost never "Alpha Males"



"After I picked up the handgun, I brought it back to my room and felt a new sense of power. 'Who's the alpha male now, bitches!" - Elliot Rodger

How do Guns Figure into the Mix?



The "Weapons Effect"

Aggressive 'cues'

- Aggressive 'cues' ➤ trigger aggression (Berkowitz) e.g., guns, knives, the colour black.
- Weapons effect
 - Mere presence of weapon increases aggressive behavior

Experimental Examples of the Weapons Effect

- Berkowitz & LePage (1967)
 - Weapons cue shocks given to other person
- Turner, Layton, & Simons (1975)
 - Aggressive stimuli (guns + bumper stickers) cue horn-honking behavior
- Bushman & Anderson (2002)
 - Violent video gaming primes aggressive responses
- Hemenway, Vriniotis, & Miller (2006)
 - Drivers with guns in car drive more aggressively
- Klinesmith, Kasser, & McAndrew (2006)

The Challenge Hypothesis (Wingfield et al., 1990)

- Testosterone levels increase in males in response to challenges to status or competition with other males
- The higher levels of testosterone facilitate the meeting of the challenge
- Often, the testosterone triggers an aggressive reaction (Archer, 2004; McAndrew, 2009).

Research Report

Guns, Testosterone, and Aggression

An Experimental Test of a Mediational Hypothesis

Jennifer Klinesmith, Tim Kasser, and Francis T. McAndrew

Knox College

ABSTRACT—We tested whether interacting with a gun increased testosterone levels and later aggressive behavior. Thirty male college students provided a saliva sample (for testosterone assay), interacted with either a gun or a children's toy for 15 min, and then provided another saliva sample. Next, subjects added as much hot sauce as they wanted to a cup of water they believed another subject would have to drink. Males who interacted with the gun

replicate such effects (Archer, 1991; Archer, Birring, & Wu, 1998; O'Connor, Archer, Hair, & Wu, 2001; Rowe, Maughan, Worthman, Costello, & Angold, 2004).

Surprisingly, we were unable to find any studies that examined whether testosterone and the presence of a weapon might work together to increase aggressive behavior. Perha ps the presence of a stimulus such as a gun triggers increases in testosterone levels, which in turn increase aggressive behavior. Such a chain

Guns, Testosterone, & Aggression

(Klinesmith, Kasser, & McAndrew, 2006)

- 30 male college students
 - Believed they were in a study of taste sensitivity
- Provided a saliva sample at beginning of study
- Cover Story: Was taste sensitivity associated with the attention to detail required for creating instructions for how to assemble and disassemble a complex object?
- Two experimental groups:
 - Desert Eagle automatic handgun vs. mousetrap game
 - Handled object, examined diagram, and wrote instructions (15 minutes)







Guns, Testosterone, & Aggression

(Klinesmith, Kasser, & McAndrew, 2006)

- 2nd saliva sample taken after 15 minute session
- Tasted a cup of water (85g) with one drop of hot sauce in it
 - Rated taste on a series of scales
- Next, prepared a sample for the next subject
 - Could add as much hot sauce as desired to an 85g cup of water
 - Cup was weighed to see how much hit sauce was added
- Subjects were relaxed by watching nature video and listening to classical music before leaving lab

Guns, Testosterone, & Aggression

(Klinesmith, Kasser, & McAndrew, 2006)

- RESULTS:
 - Handling a gun increased testosterone levels
 - Increased testosterone level mediated the aggressiveness of their response

Precarious Manhood & Terrorism



Nicolas Henin was a Frenchman who was held hostage by ISIS for ten months. Here's how he described his young, murderous, Jihadi captors:



They present themselves to the public as superheroes, but away from the camera are a bit pathetic in many ways: street kids drunk on ideology and power. In France we have a saying - stupid and evil. I found them more stupid than evil. That is not to understate the murderous potential of stupidity.

Protecting Manhood & Valor:

- The Stolen Valor Act of 2005
 - Signed into law by George W. Bush in 2006
 - Prohibits the unauthorized wear, sale, or manufacture of military decorations and medals
- The Stolen Valor Act of 2013
 - Makes it a crime for a person to fraudulently claim to have received military medals and decorations



The "Young Male" Syndrome



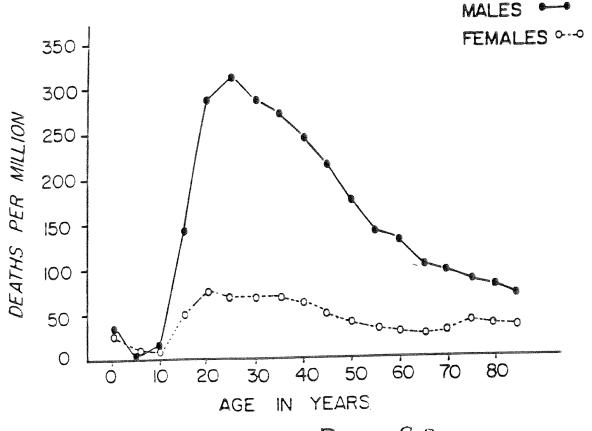
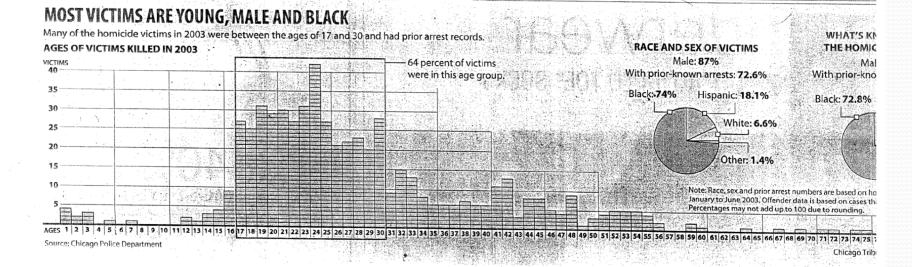


Figure 8.8

Homicide victimization rates by age and sex for the United States in 1975. Data from U.S. Department of Health, Education, and Welfare (1979) and U.S. Bureau of the Census (1977).



Why a Young Male Syndrome?

- In ancestral environments, competitive success in early adulthood determined social standing for life
- High risk competition between young males provides an opportunity for "showing off" abilities to acquire resources and meet challenges to status
- Testosterone peaks in late adolescence
- Are sports a modern substitute for earlier hunter/gatherer displays?

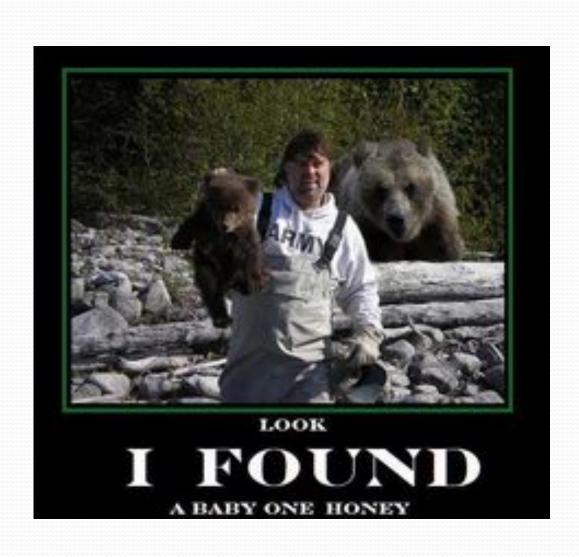


For the five years period of 2010 – 2014, the Darwin Award winners have been skewed toward men by a margin of 38 to 5, with two of the five women who made the list getting there by being talked into having sex with men under less than rational circumstances.























Video Clip #1

Video Clip #2

Video Clip #3

Video Clip #4

Video Clip #5

Video Clip #6

The "Crazy-Bastard" Hypothesis

(Fessler, et al, 2014)



Cultural Influences, Family Violence, &

Going to War



Cultural Influences, Family Violence, & Going to War



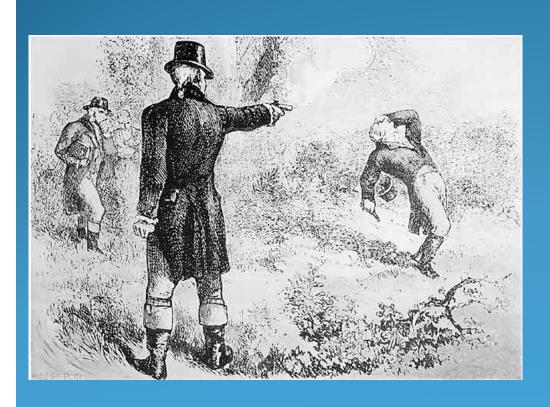
The most frequent cause of urban homicide is a trivial public dispute between two men.

Cultural Influences, Family Violence, & Going to War



Unemployed & unmarried men are more likely to be the perpetrators *and* victims of murder.

Cultures of Honor

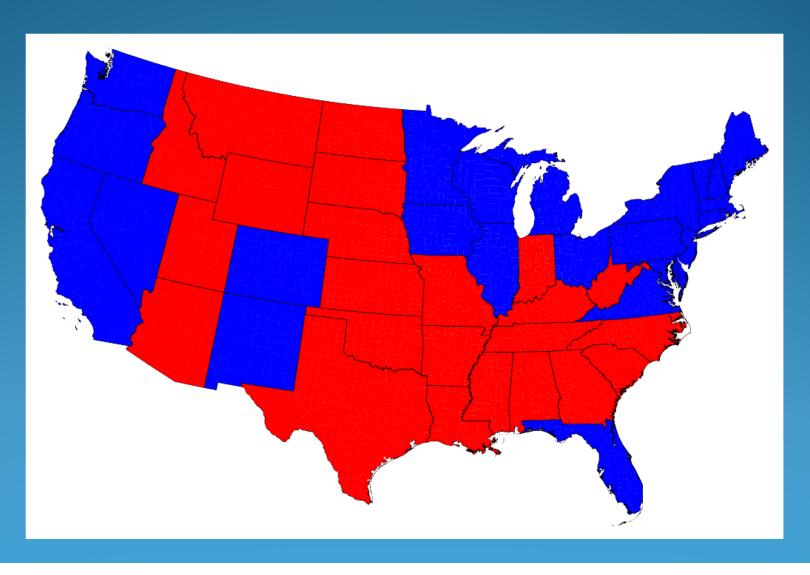




Characteristics of Cultures of Honor

- *Law enforcement is weak or absent
- *Resources are easily stolen by others
- *Uneven distribution of resources
- *If culture has stable, strong social organization, anti-social violence will be constrained, but "honor" disputes will be encouraged.

Cultures of Honor in the USA



Cultures of Honor in the USA

Violence & its acceptance are higher in the West and South for Caucasian Americans; There is also evidence for a culture of honor among inner-city African-American men

Some Data (and examples) on American Cultures of Honor -



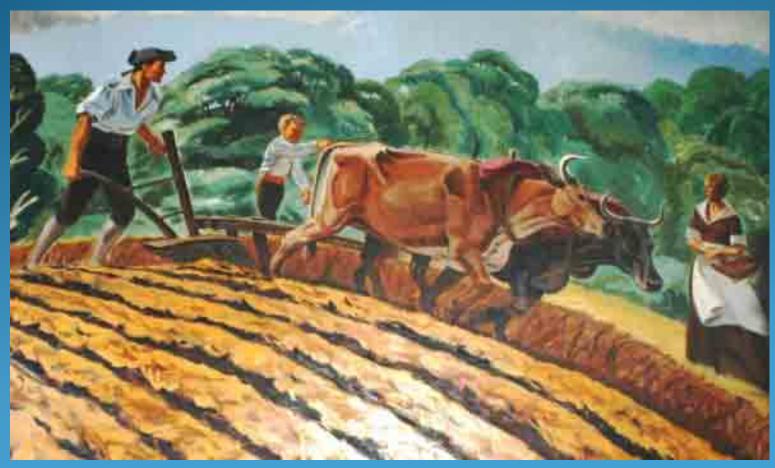
Selected Research Findings:

- Small towns in the South have triple the homicide rates of small towns in the North
 - Difference in homicide rates due entirely to homicides following argument or insult
- Students in Culture of Honor States are more likely to have brought a weapon to school.
- There are significantly more school shootings in Culture of Honor states.(twice as many per capita)
- Residents of Culture of Honor states desire more extreme, violent responses to terrorist acts.

Selected Research Findings:

- Southerners are more accepting of three types of violence:
 - Self-defense
 - Corporal punishment of children
 - Responding to insults
 - e.g., study of cover letters with job application revealing prison time
- People in the West & South watch more violent TV programs
- People in the West & South have higher subscription rates to magazines featuring weapons, combat, & physical strength
- Southern White males and inner-city Black males respond to insults with more stress, anger, higher levels of arousal, & elevated levels of testosterone
 - e.g, University of Michigan laboratory study

Origins of Regional Differences?



North originally settled by farmers with Puritan, Quaker, & Dutch backgrounds

Origins of Regional Differences?



South originally settled
By Scotch/Irish settlers
with long herding Tradition.

Origins of Regional Differences?



South originally settled
By land-owning noble gentry with a long-standing code of manly honor.

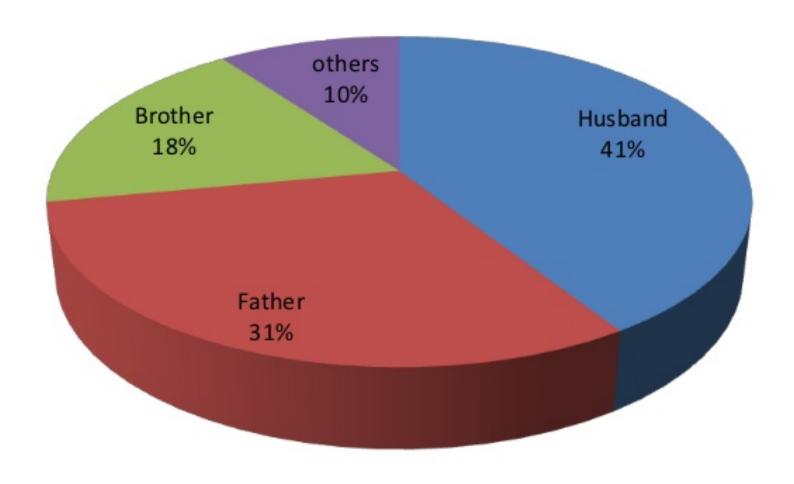
"Honor Killings" & Violence Against Women





Degree of Relationship between the Victims and the Murderer

Murderer



Cultures of Honor

Commentary on Cultures Of Honor by David Buss: (Show clip from 2:30 to 5:00)

Family Violence

- Reproductive value of child & parents' life circumstances are the best predictors of violence
- Children killed by parents usually born to young parents with capacity to produce more
- Infants (<1) are more likely to be murdered than older children
- Health of infant and circumstances of mother are predictors of neglect, abuse, murder

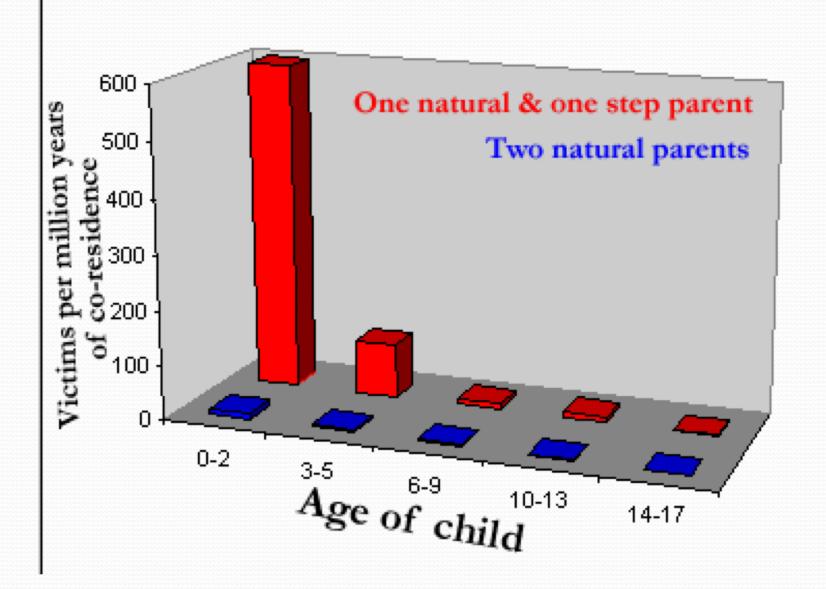
Family Violence

- Male violence against spouses is usually triggered by sexual jealousy
- Younger wives are at greatest risk
- Degree to which biologically related children looked like father correlated with quality of relationship with kids and severity of injuries inflicted on wife
 - Based on a study of 55 men in a domestic violence treatment program

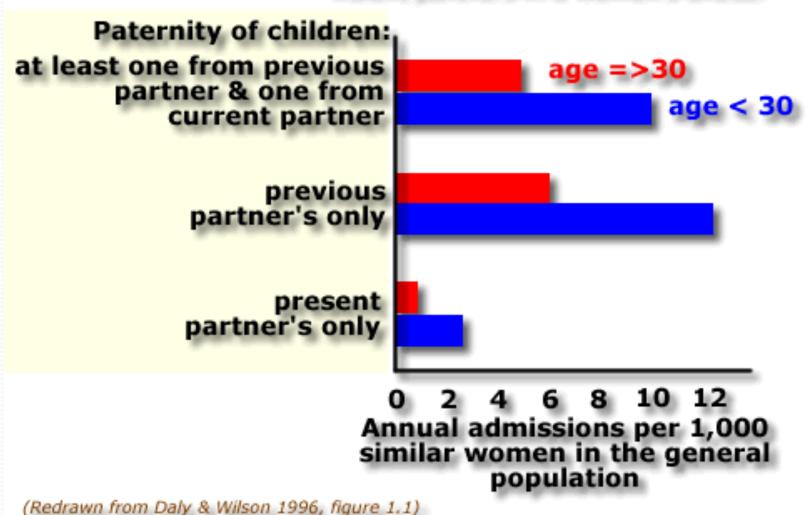
Family Violence

- It is a myth that blood-related family members kill each other on a regular basis
 - Rates of child abuse are 50 to 100 times higher in stepfamilies
 - You are 11 times more likely to be killed by a non-kin family member
 - Big difference in murder style between stepfathers and biological fathers

Child Murder is More Common by Step Parents than Natural Parents



The presence of a previous partner's child increases the number of young, and older, women seeking refuge from violent partners in a women's shelter



WARFARE



The Psychotic Fantasy that Warfare Seeks Gain

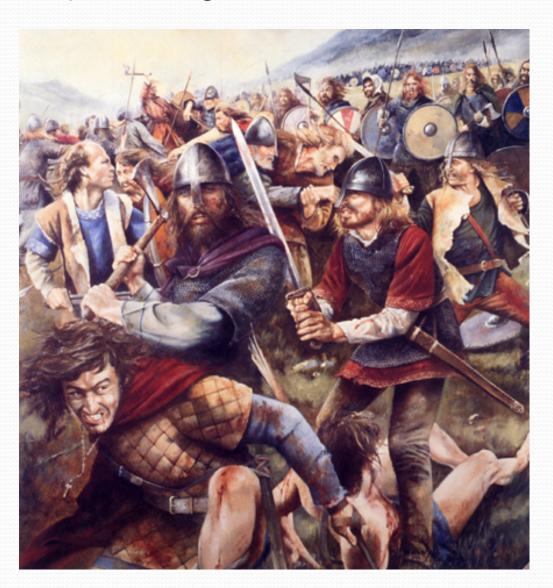
What a bizarre idea: that those who wage war act rationally and seek "gain." Political leaders collude with historians to maintain this psychotic fantasy.

First World War Casualties

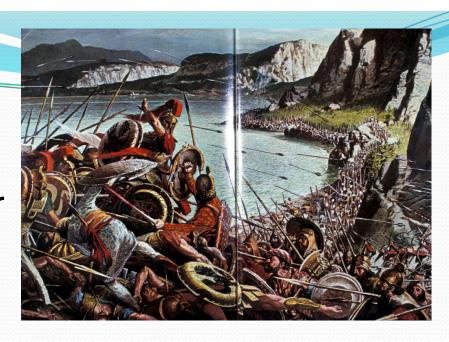
Country	Men mobilised	Killed	Wounded	POW's + missing	Total casualties	casualties in % of men mobilised
Russia	12 mil	1.7 mil	4.9 mil	2.5 mil	9.15 mil	76.3
France	8.4 mil	1.3 mil	4.2 mil	537,000	6.1 mil	73.3
GB + Empire	8.9 mil	908,000	2 mil	191,000	3.1 mil	35.8
Italy	5.5 mil	650,000	947,000	600,000	2.1 mil	39
USA	4.3 mil	126,000	234,000	4,500	350,000	8
Japan	800,000	300	900	3	1210	0.2
Romania	750,000	335,000	120,000	80,000	535,000	71
Serbia	700,000	45,000	133,000	153,000	331,000	47
Belgium	267,000	13,800	45,000	34,500	93,000	35
Greece	230,000	5000	21,000	1000	27,000	12
Portugal	100,000	7222	13,700	12,000	33,000	33
Total Allies	42 mil	5 mil	13 mil	4 mil	22 mil	52%
Germany	11 mil	1.7 mil	4.2 mil	1.1 mil	7.1 mil	65
Austria	7.8 mil	1.2 mil	3.6 mil	2.2 mil	7 mil	90
Turkey	2.8 mil	325,000	400,000	250,000	975,000	34
Bulgaria	1.2 mil	87,000	152,000	27,000	266,000	22
Total Central Powers	22.8 mil	3.3 mil	8.3 mil	3.6 mil	15 mil	67
Grand Total	65 mil	8.5 mil	21 mil	7.7 mil	37 mil	57%

Warfare

- War is a highly cooperative activity requiring
 - Good Communication
 - Cooperation with Allies
 - Intelligent Self-Control



Necessary Precursors to War



- Distinguishing Kin from Non-Kin
- Separate Social World into "Sympathy Groups" (in-groups) & "No Sympathy Groups" (out-groups)
- Ideologies, Religions, Prejudices, etc
 - They create certainties and a moral high ground
 - They facilitate dehumanizing perceptions of outsiders
 - Most effective military units = Strong in-group identification + Callousness to the fate of outsiders
 - "Ethnic Cleansing" has been celebrated throughout history
- High Concentrations of Young Men in Population

War is Costly and Risky:

For warfare adaptations to evolve, four essential conditions must be met (Tooby & Cosmides, 1988)

- Long-term gain in reproductive resources must be great
 - i.e., increased sexual access to women
- Coalitions must believe that they will be victorious
 - i.e., collective resources will be greater after war than before
- Individual rewards must be proportional to risk/importance of contribution
 - i.e., cheaters must not prosper!
- There must be a "Veil of Ignorance"
 - Men going to war must not know for sure whom will live and who will die



Is War Just a Chance for Men to Show Off?

 Does War Provide an arena for men to compete and impress male rivals and females who might be potential mates? (Van Vugt, et al., 2007)



Do War Heroes Achieve Greater Reproductive Success?

- 464 American men who had won the Medal of Honor during World War II eventually had more children than other U.S. servicemen who were not as distinguished (Rusch, et al., 2015)
- 92 women rated the sexual attractiveness of men who had behaved heroically in war as higher than soldiers not identified as heroes (Rusch, et. al., 2015)
 - The same effect was not found for men behaving heroically in sports or business!

Protecting a Reputation for War Heroism:



- The Stolen Valor Act of 2005
 - Signed into law by George W. Bush in 2006
 - Prohibits the unauthorized wear, sale, or manufacture of military decorations and medals
- The Stolen Valor Act of 2013
 - Makes it a crime for a person to fraudulently claim to have received military medals and decorations

Proposition:

Men have an evolved psychological mechanism for warfare; women do not



Is the Ability to Kill from a Distance the True Source of Our Humanity? (Bingham, 2000)

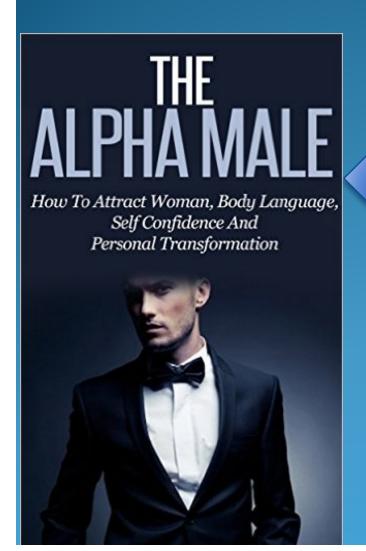




How could remote killing be a source of noble qualities?

- Before remote killing, the enforced cooperation of others in physical confrontation was difficult and costly
- Simultaneous remote attacks decrease risk to individual attackers
- It is possible to punish cheaters from a distance
- Social cooperation could be easily enforced
- Size of human groups have historically increased with new killing technologies
- Did ethics and moral outrage evolve to enforce coalitions & to help one avoid consequences of being a cheater?

The Making of an Alpha Male



Show first 1:10 of clip

Alpha Males Exist in Social Species





Alpha Males Exist in Social Species



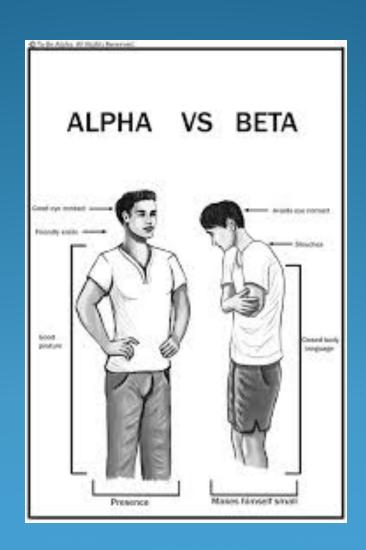


Alpha Males Exist in Social Species



Java Macaque

Alpha Male versus Beta Male



Alpha Male versus Beta Male

Alpha Male Definition:

- The dominant male animal in a particular group
- A man who assumes the dominant role in social and professional situations

Beta Male Definition:

- Males who defer to alpha male (often as a result of losing in head-to-head competition)
- "Second-in-Command"; may assume alpha status if conditions change

Alpha Male versus Beta Male



Who becomes an Alpha Male is relative; it depends upon the context



Sexual dimorphism refers to the extent to which the two sexes in a species differ in size or appearance



Sexual dimorphism reflects the intensity of competition between males for access to mates



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Sexual dimorphism reflects the intensity of competition between males for access to mates



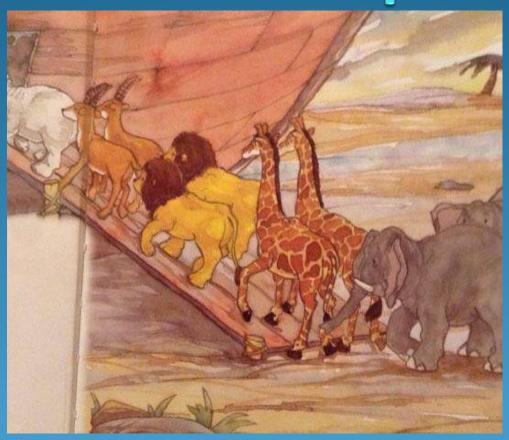
Sexual dimorphism refers to the extent to which the two sexes in a species differ in size or appearance



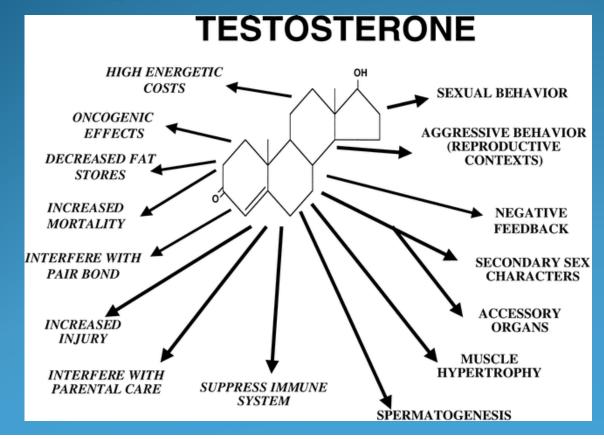
Sexual dimorphism reflects the intensity of competition between males for access to mates



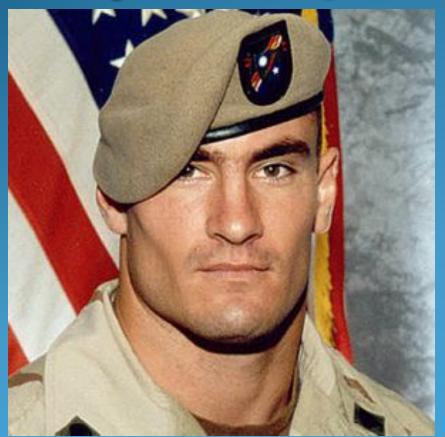
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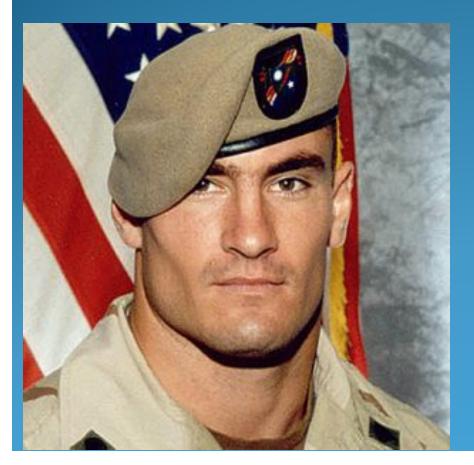
Testosterone levels are correlated with dominance



Size Matters!



Studies consistently show that tall men are preferred as mates, receive higher salaries, and are more likely to win elections (Gillis, 1982).



In a study, 122 Dutch leaders rated their bosses on charisma. Height was positively correlated with charisma for male, but not for female, bosses.

(Hamstra, 2014)

Heights of Presidential Candidates

Winner (year - height)

- Obama (2012 6'1")
- Obama (2008 6'1")
- G.W. Bush $(2004 5' 11\frac{1}{2}")$
- G.W. Bush $(2000 5' 11 \frac{1}{2}")$
- Clinton (1996 6'2")
- Clinton (1992 6' 2")
- G.H.W. Bush (1988 6' 2")
- Reagan (1984 6'1'')
- Reagan (1980 6'1'')

Loser (year - height)

- Romney $(2012 6' 1 \frac{1}{2}'')$
- McCain (2008 5'9")
- Kerry (2004 6'4")
- Gore (2004 6' 1")
- Dole (1996 6' 1 ½")
- G.H.W. Bush (1992 6'2")
- Dukakis (1988 5' 8")
- Mondale (1984 5' 11")
- Carter $(1980 5' 8 \frac{1}{2}'')$

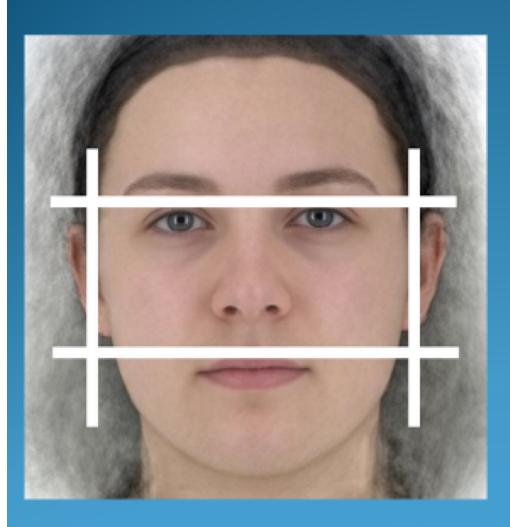
Heights of Presidential Candidates

Winner (year - height)

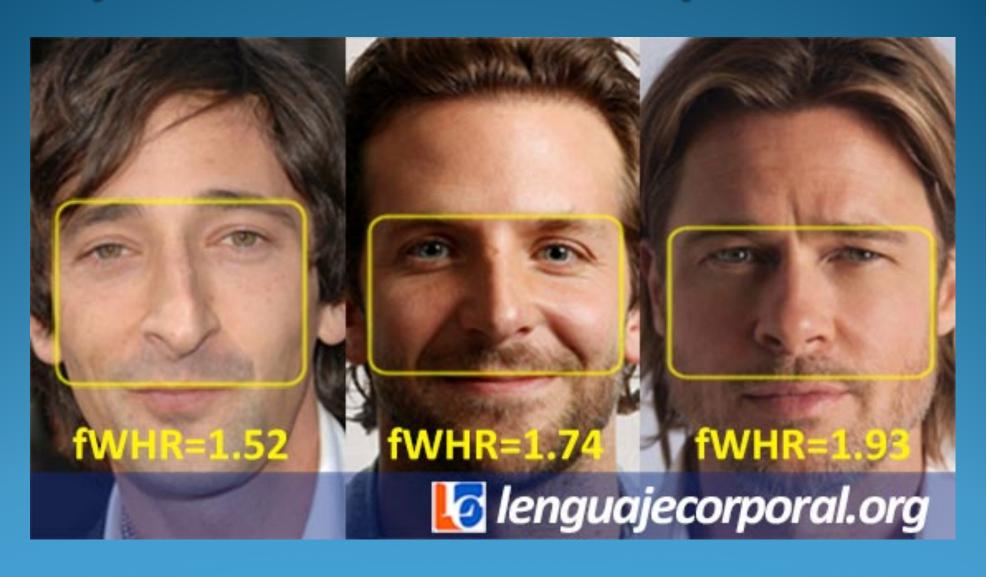
- Carter $(1976 5' 8 \frac{1}{2}'')$
- Nixon $(1972 5' 11 \frac{1}{2}'')$
- Nixon $(1968 5' 11\frac{1}{2}'')$
- Johnson (1964 6' 3 ½")
- Kennedy (1960 6'0'')
- Eisenhower $(1956 5' 10\frac{1}{2}'')$
- Eisenhower $(1952 5' 10\frac{1}{2}'')$
- Truman (1948 5'9'')
- F.D. Roosevelt (1944 6' 2")

Loser (year - height)

- Ford (1976 6'0")
- McGovern (1972 6'1")
- Humphrey (1968 5'11")
- Goldwater (1964 5'11")
- Nixon (1960 5' 11 ½")
- Stevenson (1956 5' 10")
- Stevenson (1952 5' 10")
- Dewey (1948 5'8'')
- Dewey (1944 5' 8")



A high facial width to height ratio (fWHR)



High fWHR predicts many things:

- Ratings of aggressiveness/dominance (Carre et al., 2009, 2010)
- Actual aggressive behavior (Goetz, et al., 2012; Welker et al., 2014)
- Psychopathy (Anderl et al, 2016; Geniole et al., 2014)
- Achievement Drive(Lewis et al., 2012)
- More home runs by baseball players (Tsujimura & Banissy, 2013)
- Unethical behavior (Geniole et al., 2014; Haselhuhn & Wong, 2012)
- Negotiation Performance (Haselhuhn et al., 2014)
- Formidability as a fighter and actual fighting success
- (Trebicky et al, 2013, 2015; Zilioli et al., 2014)

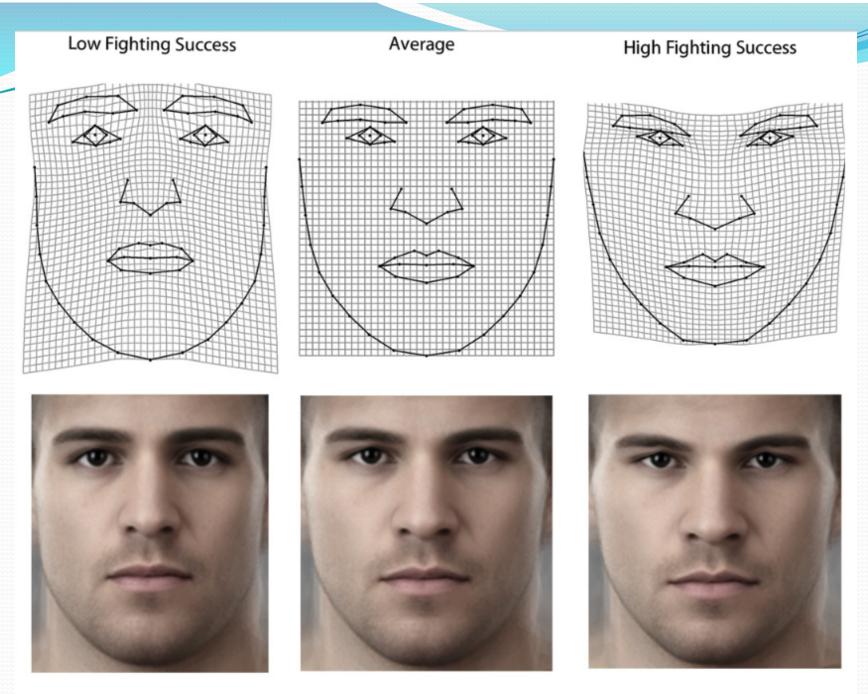
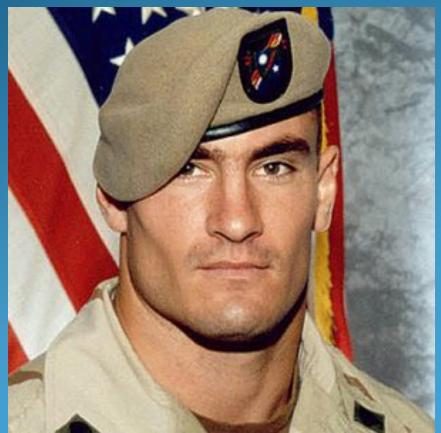


Fig. 2. Visualization of the shape regression on fighting success by thin-plate spline-deformation grids (top row) and composite visualizations (bottom row), based on faces of heavyweight fighters. Results are shown separately for low and high fighting success, with the average reference shown for comparison; the effects were magnified 3 times for better visibility. The composite visualizations are based on landmark configurations estimated by shape regression; the effects are shown within the observed range.

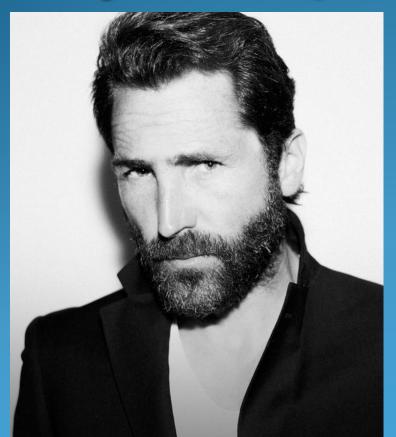


Facial dominance in West Point cadets (class of 1950) predicted speed of promotions & eventual rank 30 years later. (Mazur, 2005)



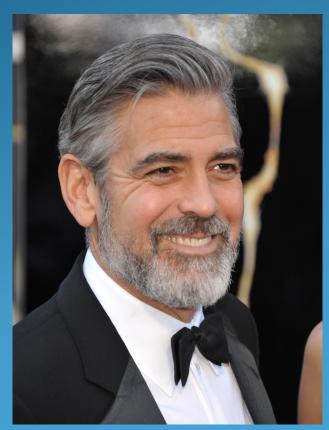
"Dominant" Facial Features (reflect maturity and testosterone)

Square Jaw, prominent brows, smaller eyes, beards



"Dominant" Facial Features (reflect maturity and testosterone)

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"Dominant" Facial Features (reflect maturity and testosterone)

Square Jaw, prominent brows, smaller eyes, beards

Low-pitched voice (Reflects body size and testosterone)

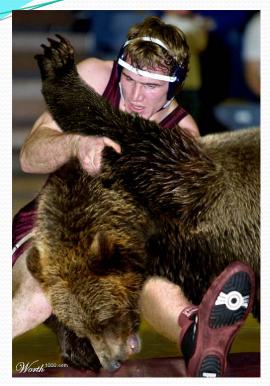


Tapering "V" shaped physique



Athletic Prowess

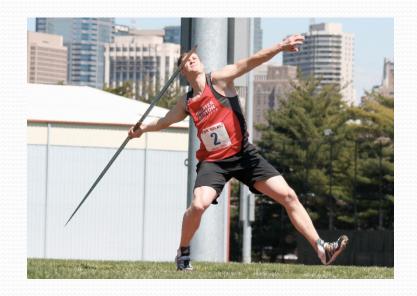
Sports as Male Display













Other Stereotypic Qualities of Alpha Males (from tobealpha.com)

Competitive

Comfortable with physical contact

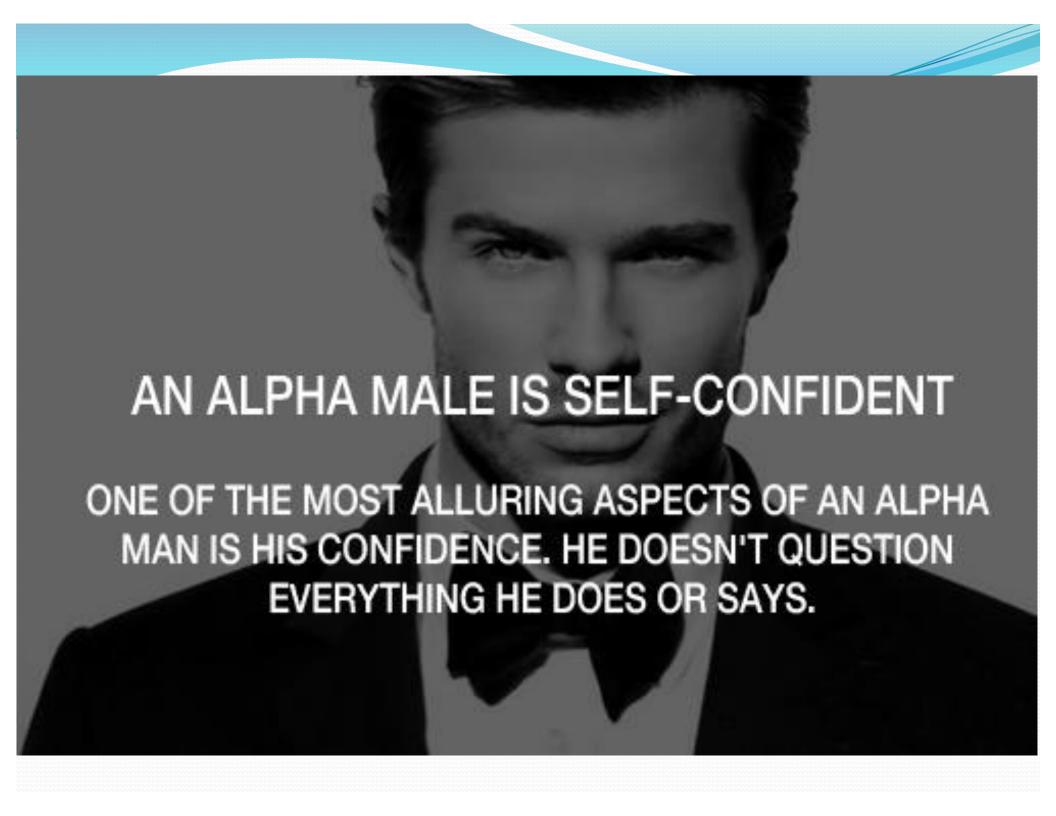
Perseverance

Risk Taker

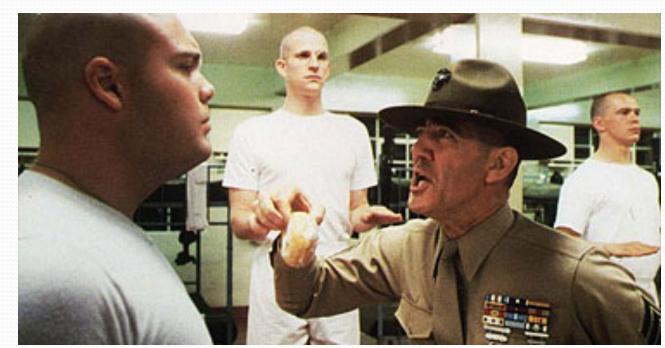
Doesn't try too hard to be everyone's friend

Calm under pressure

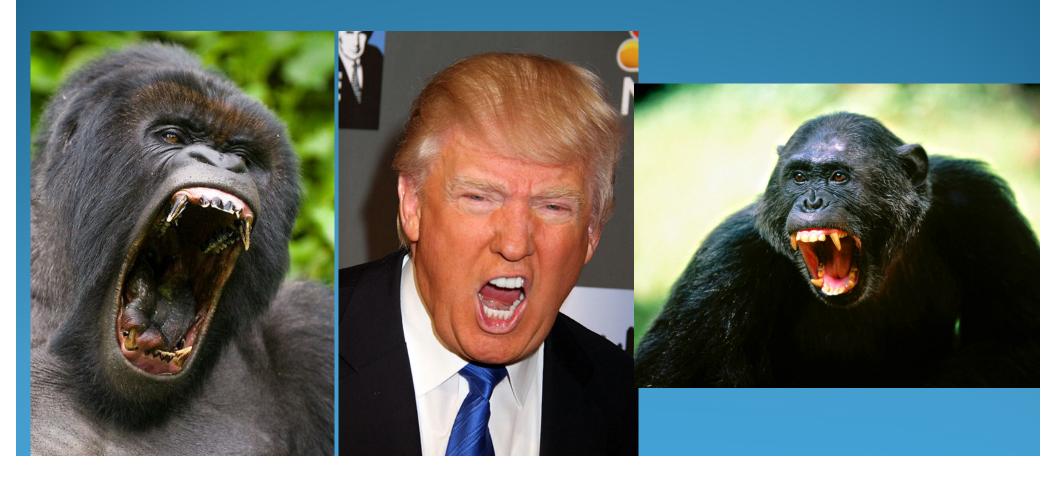
Dominant



Status & Nonverbal Behaviors



- High Status People:
 - Control more space
 - More touching
 - Look more while speaking, less while listening
- Low Status People:
 - More tense posture
 - More smiling
 - More looking while listening, less while speaking









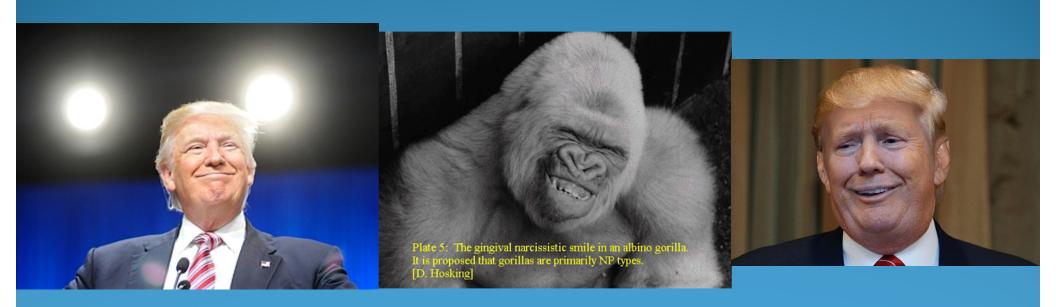








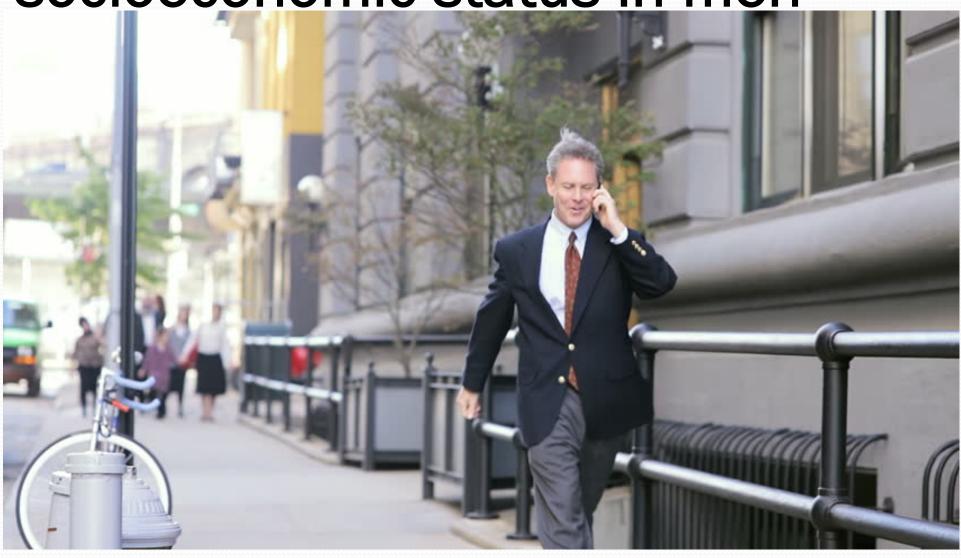




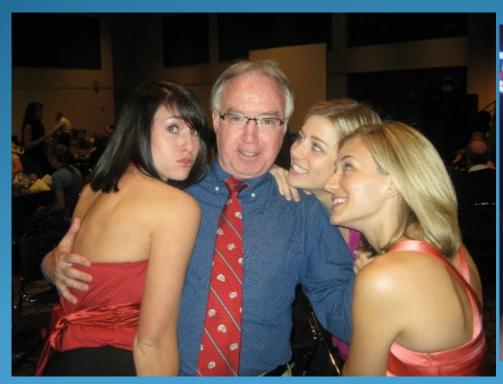


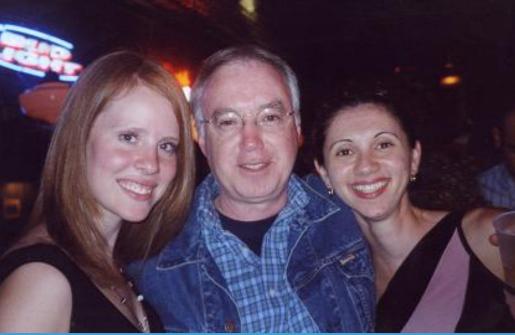


Walking speed is linked with socioeconomic status in men



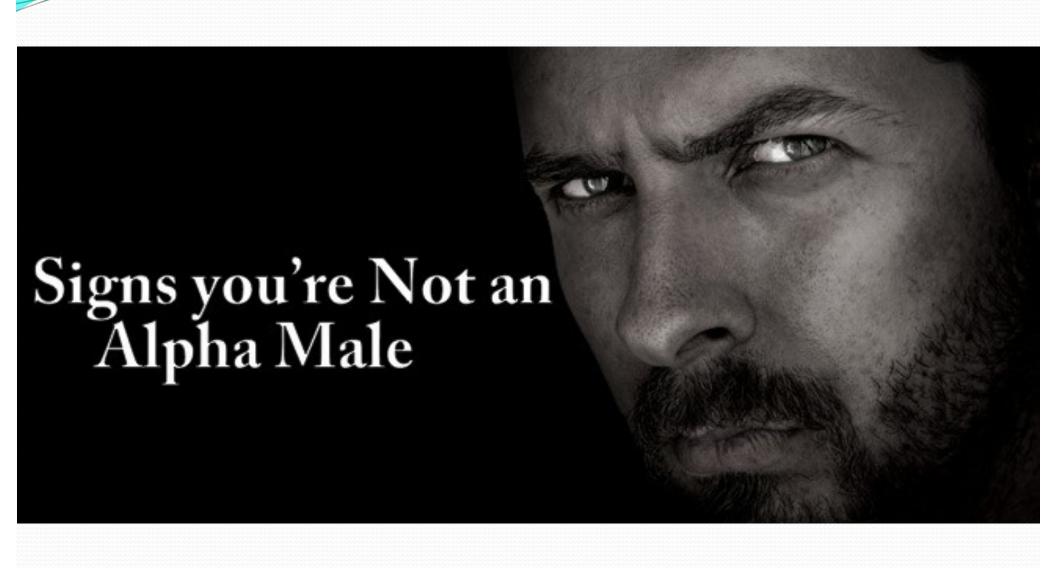
In real life, do alpha males achieve greater mating success?



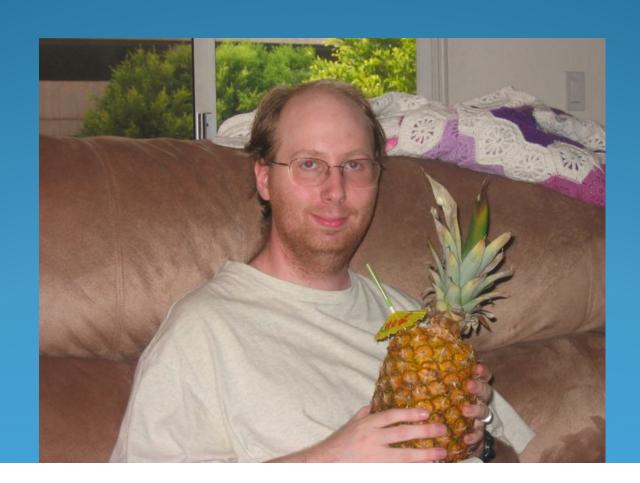


In real life, do alpha males achieve more mating success?

- Men higher in status marry women who are more physically attractive (Elder, 1969; Taylor & Glenn, 1976; Udry & Eckland, 1984)
- Men scoring high on social dominance have more affairs (Egan & Angus, 2004)
- Socially dominant adolescent males are more sexually active (de Bruyn & Cillessen, 2012)
- Men with high incomes and status have more frequent sex and more children (Hopcroft, 2006; Weeden, Abrams, Green, & Sabini, 2006)
- In each of six early human societies (Mesoptamia, Egypt, Aztec Mexico, Incan Peru, Imperial India & China), men had a harem of women reserved for them. The size of the harem depended upon the man's status.



What is an "Omega Male?"



What is an "Omega Male?"



Omega males are the lowest caste of the hierarchical society. Omega animals are subordinate to all others in the community, and are expected by others in the group to remain submissive to everyone. Omega animals may also be used as communal scapegoats or outlets for frustration, or given the lowest priority when distributing food.

Signs You May Be an Omega Male

(from AskMen.com)

- Your comic book collection or video games are your identity
 - Don't take any hobby to excess
- You refuse to look for a 9-to-5 job on principle
 - Fear of meeting expectations?
- You are the only remaining original member of the band
 - Trapped in unrealistic adolescent dreams of greatness?
- You are still going to your college bar
 - Out of step with peers on life journey
- You dress "ironically" to show that you don't care about society's conventions
 - Can't compete very well, so you may as well embrace it

Signs You May Be an Omega Male

(some credited to Rodney Dangerfield)

- You catch a Peeping Tom booing you
- Your wife has cuts you down to sex once per month
 - But you are grateful, because you know some guys that she has cut out altogether
- When you walk through a corridor with sensors that turn lights on automatically, the lights go off
- You buy a pet because you are lonely and then it sleeps 22 hours per day
- You go into a bar and say "make me a zombie", and the bartender replies that "God beat me to it."
- Your wife meets you at the door in a sexy negligee, but unfortunately she is just coming home
- At the beach, the 98 pound weakling kicks sand in your face

Signs You May Be an Omega Male

- If you see two people together and one of them looks bored, you are the other one
- You walk into the morgue and offer to "whip any man in the house"
- You are so indecisive that you have a seven year old son whom you haven't named yet
- Behind your back, your coworkers describe you as being as useless as a glass eye at a keyhole
- When you tell your friends that you wish to be cremated, they ask "when?"
- You are always pulling tomorrow's cloud over today's sunshine.