I. Foundations of Evolutionary Psychology (EP)

A.   EP focuses on 4 key questions:

1.   Why is the mind designed the way it is?

2.   How is the mind designed—what are its mechanisms?

3.   What are the functions of mechanisms? How are they organized?

4.   How does environmental input interact with mechanisms to produce behavior?

B.   Evolutionary Thinking before Darwin (1859)

1.   Lamarck—early 1800s
    a.   Species progress toward "higher form"
    b.   Inheritance of acquired characteristics

2.   Couvier—early 1800s: Catastrophism

3.   Evidence for changes over time before Darwin:

    a.   Cross-species structural similarities
    b.   Fossil record
    c.   Cross-species comparisons of embryological development
    d.   Traits with apparent function

4.   Before Darwin (1859), no causal mechanism for changes over time that produced traits with apparent function

C.   Darwin/Wallace Theory of Evolution by Natural Selection (ENS)

1.   3 key questions:

    a.   How do species originate?
    b.   Why do species change over time?
    c.   Why the apparent functionality of traits?

2.   Malthus (1798): "An Essay on the Principle of Population"

    a.   Struggle for survival
    b.   Favorable variations preserved, unfavorable removed

3.   3 properties of ENS:

    a.   Variation
    b.   Selection
    c.   Retention—via success in survival reproduction

4.   Key is Differential Reproductive Success

5. 2 broad classes of evolved variants:

    a. Survival (ENS)
    b. Reproduction (ESS)

6. ENS not forward-looking or intentional

7. ENS is gradual

8. ENS links all life in single grand framework

9. Early objections to ENS:

    a. Lacked solid theory of heredity
    b. How early stages of adaptation beneficial?
    c. Religious creationists

D. The Modern Synthesis

1. Mendel—late 1800s—inheritance is particulate, not "blending"

2. 1930s—Modern Synthesis: Unification of ENS with particulate gene inheritance

E. Ethology

1. Early focus on imprinting (Lorenz, 1940s)

2. Highlighted for biologists importance of adaptation

3. Shortcomings

    a. Labeling, not explaining
    b. Focus on observable behavior—little attention to mental life
    c. No rigorous criteria for identifying adaptation

4. Inclusive Fitness Theory (Hamilton, 1964)

    a. IF = individual's RS (classical fitness) + RS of relatives due to individual's help (weighted by r)
    b. "Gene's eye" perspective

F. Williams (1966): Clarifying Adaptation and ENS

1. 3 major impacts on biology

    a. Challenged group selection
    b. Popularized IF Theory
    c. Clarified "adaptation":

"Evolved solution to specific problem that contributes directly or indirectly to successful reproduction"

2. How to identify adaptations?:

    a. Reliability
    b. Efficiency
    c. Economy
    d. Improbable Usefulness

G. Robert Trivers—early 1970s

1. Reciprocal altruism (1971)

2. Parental investment & sexual selection (1972)

3. Parent-offspring conflict (1974)

H. Sociobiology

1. E. O. Wilson, 1975, <u>Sociobiology: The New Synthesis</u>

2. Final chapter on humans—grand claims, little data

I. Common Misunderstandings about EP

1. Human behavior is genetically determined

2. If it's evolutionary, it's unchangeable

3. Evolutionary theory requires impossible computational abilities

4. Current mechanisms are optimally designed;
   2 constraints on optimal design:

    a. Evolutionary time lags
    b. Costs of adaptations

5. Evolutionary theory implies motivation to maximize genetic propagation

J. Key theories in psychology preceding EP

1. Psychoanalytic theory (Freud)—late 1800s

    a. 2 core sets of instincts
        1. Life-preservative
        2. Sexual
    b. Parallels Darwin's 2 classes of adaptations
    c. No clear discussion of adaptation, group selectionistic, motivated to created "new, autonomous theory"

  2. Instinct psychology (W. James)

      a.   Principles of psychology (1890)

      b.   "Instincts"—evolved solutions to adaptive problems

      c.   Humans = many instincts

3. Behaviorism

      a.   Watson, 1920s—Most organisms have single, all purpose learning mechanism:

          Classical conditioning

      b.   Focus of psychology is observable behavior

      c.   Skinner, 1930s, 1940s—Radical behaviorism, operant conditioning

      d.   Key assumptions of behaviorism:

          1.   Humans possess one innate property—general ability to learn
          2.   Equipotentiality

      e.   Assumptions dominated psychology for 50 years

      f.   Nature of human nature?—No nature!

4. Fall of behaviorism: 1960s, 1970s

      a.   Garcia effect: prepared fears;
          1.   Contiguity?
          2.   Equipotentiality?

      b.   Harlow's work with monkeys

5. Cognitive revolution

      a.   Return to "black box"—information processing
      b.   Domain-generality retained—problems, e.g., combinatorial explosion
      c.   EP provides missing pieces of puzzle:

          1.   Domain-specificity, due to
          2.   Specificity of adaptive problems

II. Introduction to EP

A.   Origin of Complex Mechanism

      1.   Creationism
      2.   Seeding theory
      3.   ENS

B.   Products of ENS

      1.   Adaptations (e.g., umbilical cord)

        a.   Inherited
        b.   Reliably developing
        c.   Solved problems of survival or reproduction
        d.   Most are species-typical

   2.   Byproducts of adaptations—no functional design (e.g., belly button)

   3.   Noise—random effects, independent of adaptations (e.g., "iny" vs. "outy")

C.   Levels of Analysis in EP

   1.   Inclusive fitness theory

   2.   Middle level evolutionary theories
          <u>Ex.</u>: Sperm Competition Theory

   3.   Specific evolutionary hypotheses
          <u>Ex.</u>: Men faced with greater risk of SC will be more interested in sex with partner

   4.   Specific predictions derived from hypotheses
          <u>Ex.</u>: Men who spend more time apart from partner since last sex will report greater interest in sex with partner

D.   Strategies for Generating and Testing EP hypotheses

   1.   Theory-driven, "top-down"
   2.   Observation-driven, "bottom-up" (reverse engineering)

E.   Core of Human Nature: Evolved Psychological Mechanisms (EPMs)

   1.   All species have a nature—including humans

   2.   All psych theories imply human nature

   3.   ENS only known causal process capable of designing EPMs, the core of human nature, thus

       All psych theories are "evolutionary"

   4.   EP focuses on design of mind—collection of EPMs, contexts that activate EPMS, and output generated by EPMs

F.   Defining EPM—set of processes in brain, with following properties:

   1.   EPM exists in form it does because it solved specific problem of survival or reproduction recurrently over evolutionary history

   2.   EPM designed to take in specific class of information

   3.   Input of EPM tells organism the particular adaptive problem faced

4. Input of EPM transformed through decision rules into output

5. Output of EPM can by physiological activity, information to other EPMs, or observable behavior

6. Output of EPM directed toward solution to specific adaptive problem

G. Key features of EPMs:

1. Provide non-arbitrary criteria for "carving the mind at its joints"—focus on function

2. Tend to be problem-specific

3. Humans mind comprised of MANY EPMs

4. Human behavioral flexibility (including cultural variability) attributable to specificity, complexity, and numerousness of EPMs

H. Identifying Adaptive Problems—Guidance from:

1. Inclusive fitness theory
2. Human universals
3. Traditional societies
4. Archeological record
5. Current PMs
6. Task analysis

I. How to Test EP Hypotheses?

1. Cross-species comparisons
2. Comparing males and females
3. Comparing individuals within a species
4. Comparing same individual in different situations
5. Experiments

J. Sources of Data for Testing EP Hypotheses

1. Archeological records
2. Traditional societies
3. Self-reports
4. Observations
5. Public records
6. Modern human products

II. Combating the "Hostile Forces of Nature"

A. Introduction

1. Differential RS is engine of ENS
2. But to reproduce, must survive
3. Host of adaptive problems threatened survival of ancestral humans:

Weather, food shortages, toxins, diseases, parasites, predators, and hostile conspecifics

4. Hostile forces of nature provided selection pressures for evolved solutions

B. Getting and Eating Food

1. Without food, we die!
2. Key adaptive problem: Obtaining sufficient calories and nutrients, but avoiding toxins
3. Adaptive sub-problems:

   a. Recognizing food
   b. Capturing food
   c. Handling food
   d. Consuming food
   e. Digesting food
   f. Coordinating food intake with current physiological needs

4. Special adaptive problems of omnivory—eating both plants and animals

   a. Plants have adaptations to avoid being eaten—can be toxic to humans
   b. Our ancestors were in conflict with plants!

5. Food Selection in Humans

   a. Cross-culturally, people spend more money on food than almost anything else
   b. Food is center of parent-infant interactions
   c. Food sharing is key social activity, cross-culturally: potlucks, celebrations, status contests
   d. Food plays important role in mating

      1. Courtship
      2. Reconciliation
      3. Infidelity
      4. Divorce

   e. Food metaphors reveal powerful underlying psychology

   f. Natural toxins and evolved mechanisms

      1. What tastes and smells bad are not random
      2. Gagging, spitting, vomiting designed to prevent toxin ingestion or to get rid of ingested toxins
      3. Rozin (1996) study of American and Japanese—What is disgusting?

         a. 25% of written responses = feces and other body wastes
         b. What is disgusting threatens survival

C. Pregnancy Sickness (PS)

1. First 3 mo. of pregnancy

2. Between 75% and 89% of women report nausea, 55% vomit
3. Studies underestimate PS, because:

    a. Reports provided after first trimester—problems of recall
    b. Definition of PS doesn't include food aversions

4. Profet (1992): PS is adaptation to prevent maternal ingestion and digestion of teratogens

5. Plants contain toxins as defense against predators

6. Problem of food selection—heightened in pregnancy: How to obtain plant-held nutrients without getting toxins?

7. Most common aversions during pregnancy: coffee, tea, cocoa, meat, eggs, alcohol, vegetables

8. Virtually never reported are aversions to breads and cereals

9. If pregnant women do consume teratogens, likely to vomit—prevents absorption into bloodstream

10. Evidence for PS as adaptation to prevent ingestion of teratogens:

    a. Nauseating foods contain teratogens
    b. PS occurs when fetus most vulnerable to toxins, 2 to 4 weeks post-conception, when organs formed
    c. PS decreases by 8th week and gone by 14th week, coinciding with end of organ development and increased need for calories
    d. PS and pregnancy success: Women who do NOT have PS during 1st trimester are 3 times more likely to spontaneously abort
    e. Future work: Cross-cultural research
    f. In summary: PS better thought of as adaptation than illness!

D. Food Acquisition and Human Evolution

1. <u>The Hunting Hypothesis</u>: Transition from foraging to big-game hunting provided major impetus for human evolution

    a. Tool making, tool use
    b. Language
    c. Cooperation
    d. Large brain

2. All human groups consume more meat than any other primate societies

    Chimps: 4% of diet
    Humans: 20-40%, high as 90%

3. Big-game hunting is major method of food acquisition in modern tribal societies

4. Human physiological adaptations suggest evolutionary history of meat-eating: small intestines

5. Fossil record of human teeth—thin, not thick enamel

6. Necessity of vitamins provided by meat

7. 2-million year old animal fossils revealing butchery

8. <u>The Provisioning Hypothesis</u>: Hunting allows for emergence of relatively heavy paternal investment

9. Hunting as driving force of other human traits:

    a. Male coalitions
    b. Extended reciprocal altruism and social exchange
    c. Sexual division of labor
    d. Emergence of stone tool use

10. <u>The Showoff Hypothesis</u>

    a. Bounty from hunting:

        1. Meat comes in large packages
        2. Packages are unpredictable
        3. Conditions ripe for meat sharing beyond immediate family

    b. <u>Showoff Hypothesis</u>: Women prefer to have neighbors that are hunting showoffs, going for rare, big game

    c. In exchange for access to big game, women provide benefits to showoffs:

        1. Siding with them in disputes
        2. Providing child care
        3. Sexual favors

    d. Showoff vs. Provisioning hypothesis of big-game hunting

11. But majority of calories comes from women's gathering, not hunting

12. <u>The Gathering Hypothesis</u>: Women's activities, not men's, provided critical emphasis to evolution of modern humans

    a. Stone tools invented for digging up and gathering plants, not for hunting
    b. Later invention of containers to hold food, and tools for hunting, skinning, and butchering
    c. Hypothesis provides corrective to exclusive focus on male hunting as key to human evolution
    d. Helps account for fact that caloric bulk of modern tribal diets are acquired via female-gathered foods
    e. Highlights role of women in evolution of humans

13. Comparing the Hunting Hypothesis (HH) and Gathering Hypothesis (GH)

        a. HH, but not GH, accounts for cross-cultural sexual division of labor—men hunt, women gather

        b. Problem for GH: Stone tools not necessary for gathering—seen in great apes

        c. HH, but not GH, explains high PI of human males

        d. HH, but not GH, accounts for emergence of male coalitional psychology

        e. HH, but not GH, accounts for evolution of psychology underlying extended social exchange

14. Meat central to human evolution, but perhaps scavenging, not hunting, is key?

15. <u>The Scavenging Hypothesis (SH)</u>: Scavenging as primary source of meat and as primary impetus for human evolution

        a. Problems:

            1. Kills by large predators are rare, requiring humans to travel great distances to scavenge for adequate meat

            2. Scavenging works on leftovers—requiring even larger travel distances to get enough meat

            3. Heavy competition among other scavengers increases costs

            4. Meat rots! Primates rarely eat meat they haven't killed

            5. Modern tribal societies rarely scavenge

E. Finding a Place to Live: Shelter and Landscape
  Preferences

      1. <u>The Savannah Hypothesis</u> (SH) of habitat preferences:

        ENS favored mechanisms that motivate exploring and settling in places abundant with resources needed for living while avoiding places without these resources and places presenting survival risks

      2. Savannah of Africa—where humans evolved —fits these requirements

      3. Studies of landscape preferences support SH

      4. Natural Es preferred to human-made Es

      5. Orians & Heerwagen (1992): 3 stages of habitat selection

        a. Selection: Initial exploration

        b. Information gathering: Evaluate benefits and costs

        c. Exploitation: How long to stay?

F. Combating Predators and Other Environmental
  Dangers: Fears and Phobias

      1. Marks (1987): 4 ways in which fear and anxiety afford protection

        a. Freezing or becoming immobile

        b. Escape or avoidance
        c. Aggressive defense
        d. Submission or appeasement

2. Fear and anxiety produce evolved physiological reactions

Ex.: Epinephrine produced by fear:

        a. Acts on blood receptors to aid blood clotting in event of injury
        b. Acts on liver to release glucose, making more energy available
        c. Heart rate increases, increasing blood flow and circulation
        d. Blood flow diverted from stomach to muscles
        e. Respiration increases, increasing oxygen to muscles, speeding exhalation of CO_2

3. Modern human fears as windows to ancestral survival threats

        a. Common human fears:
           1. Snakes
           2. Spiders
           3. Heights
           4. Strangers
           5. Enclosed places

        b. Rare human fears
           1. Cars
           2. Planes
           3. Electrical outlets
           4. Guns
           5. Cigarettes

4. Ontogeny of fears
        a. Fear of heights and strangers at 6 months (crawling)
        b. Separation anxiety at 9 to 13 months (walking)
        c. Animal fear at 2 years—coincides with more intense exploration of environment
        d. Agoraphobia emerges later—when children leave home base for longer periods
        e. Adaptive Conservatism Hypothesis of Fears:

           1. Humans have evolved mechanisms that cause them to overgeneralize negative consequences of historically dangerous objects and situations

           2. Fears bias information processing in way that confirms danger of feared object—may function to maintain or enhance fear

           3. Overgeneralization causes people to be "adaptively conservative"—err on side of avoiding ancestrally dangerous objects, even at cost of mistakes

G. Avoiding Toxins: Functions of Allergies

1. Profet's (1991) Toxin Hypothesis of allergies
to explain:

      a. Particular substances to which humans are allergic
      b. Mechanisms triggered when substances encountered
      c. Specific functional properties of allergies

2. Body mechanisms triggered by allergies: Designed to prevent toxins from entering blood stream and circulating to vital organs

      a. Sneezing
      b. Coughing
      c. Eye watering
      d. Scratching
      e. Vomiting
      f. Diarrhea
      g. Extreme allergies cause drop in blood pressure

3. Domain-specificity of allergies: ENS designed immune system in domain-specific manner to recognize different classes of toxins

4. More common occurrence of allergies in industrialized than traditional societies—Why?

      a. Among traditional societies, substances that produce allergies can be identified and avoided easier than in industrialized societies
      b. People in industrial societies exposed to evolutionary novel class of chemicals contained in soaps, detergents, shampoos
      c. Less frequent breastfeeding among industrial than traditional societies

H. Combating Disease: Darwinian Medicine

1. Fever
2. Iron-poor blood
3. Pneumonic cough

I. Are Humans Programmed to Die?

1. Senescence Theory (Williams, 1957)

2. Senescence: Deterioration of all bodily mechanisms with age

3. The power of ENS decreases with age; selection more intense in youth since could affect future reproduction

4. Pleiotropy: gene has 2 or more different effects

      a. Ex. Gene→Testosterone
         1. Early life, increases competitiveness and status seeking
         2. Later life, increases risk of prostate cancer

      b. Pleiotropic gene favored because early advantage in status gains outweigh later costs of lowered survival due to cancer

4. Pleiotropic theory of senescence explains:

    a. Why organs wear out same time
    b. Why men die younger than women

        1. Selection operates more strongly on men because reproductive variance is greater for men
        2. ENS favors genes that contribute to men's mating success early in life, even if
        3. These genes have costs later in life
        4. Costs accumulate and men die younger

J. Suicide (de Catanzaro)

    1. Suicide most likely to occur when person has little ability to contribute own IF, such as:

        a. Expectations of poor future health
        b. Chronic infirmity
        c. Disgrace or failure
        d. Poor prospects for successful heterosexual mating
        e. Perceptions of being a burden on genetic kin

    2. Focus on suicidal ideation, proxy for suicide

    3. Results support De Catanzaro's EP theory

IV. Women's Long-Term Mating Strategies

A. Mate preferences solve adaptive problems

B. Theoretical background for evolution of mate preferences

    1. Asexual versus sexual reproduction

        a. Advantages:
            1. Avoid problems of mate selection
            2. All genes passed to offspring

        b. Disadvantages of sexual reproduction
            1. Problems of mate selection
            2. Only 50% of genes passed

        c. Why has sexual reproduction evolved?
            1. Genetically diverse offspring—niche variability; can't explain why asexual reproduction remains common
            2. Parasite theory

    2. Parental investment and sexual selection

        a. Size of sex cells define biological sex—males small & mobile, females large and stationary

        b. Women's greater initial investment in gametes doesn't end with egg

          1. Gestation
          2. Lactation
          3. Child care

    c. No biological law dictates that females must invest more than males

    d. Great initial PI of females makes them a valuable reproductive resource

    e. Women have much to lose from poor mate choice

    f. In summary, Trivers' (1972) theory of PI and sexual selection makes 2 key predictions:

        1. Sex that invests more in offspring will be more selective about mating
        2. Sex that invests less in offspring will be more competitive for sexual access to high investing sex

  3. Mate preferences as output of EPMs

C. The Content of Women's LT Mate Preferences

  1. Preference for economic resources

    a. May be most ancient and pervasive basis for female choice in animal kingdom

    b. Among humans, evolution of women's preference for LT mate with resources required 3 preconditions:

        1. Resources would have to be accruable, defensible, and controllable by men during human evolutionary history

        2. Men would have to differ in holdings and willingness to invest holdings in woman and children

        3. Advantages of being with 1 man would have to outweigh advantages of being with several men

  2. Preference for good financial prospects

    a. United States: 1939, 1956, 1967, 1988, 1998, women value twice as much as men

    b. "Minimum acceptable percentiles" in spouse's earning capacity: women = 70%, men = 40%

    c. Personal ads
        1. Women on marriage market
        2. Women seek financial resources 11 times as often as do men

    d. Cross-cultural work (Buss, 1989)
        1. In all 37 cultures, women value more than men good financial prospects

        2. Overall, women value 100% more than men—about twice as much

3. Preference for high social status

    a. Social status is a cue to resource holdings

    b. Cross-culturally, high status men have greater wealth and more wives and provide better care to children (Betzig, 1986)

    c. Preference for cues to future social status: education, professional degrees, promising career

    d. Cross-cultural (Buss, 1989)

4. Preference for older men

    a. In men, age is cue to access to resources

    b. Buss, 1989: In all 37 cultures, women prefer older spouses

    c. Across cultures, women prefer men about 3.5 years older

    d. Worldwide actual age difference is 3 years—women's marriage decisions match mating preferences

5. Preference for ambition and industriousness

    a. Possession of resources not enough—women need men who possess traits that cue sustained acquisition of resources over time

    b. Cross-culturally, ambitious and industrious men secure higher occupational status and greater resources than do lazy, unmotivated men

    c. Betzig (1989): Women more than men, cross-culturally, seek divorce if man loses job, lacks career goals, or shows lazy streak

    d. Buss (1989): cross-cultural work

    e. Buss, et al (1999): cross-history in U.S.

6. Preference for dependability and stability

    a. Dependability (Buss, 1989): No sex difference in 21 of 37; in remaining 16, women valued more than men in 15

    b. Emotional stability/maturity (Buss, 1989): No sex difference in 14 of 37; in remaining 23, women value more

    c. Why women value so highly?:

        1. Reliable signals to reliable resource provisioning over time

       2.   Men lacking these traits provide erratically and inflict large emotional and other costs on spouse

7. Preference for athletic prowess

    a.   Importance of physical prowess in female mate choice notable throughout animal world

    b.   Male gladiator frogs build and defend nests—bump test of females

    c.   Women sometimes face physical domination by larger, stronger males, which can lead to injury and sexual domination

    d.   Recurrent feature of primate ancestral history

    e.   Smuts (1985): "Special friendships" in baboons—exchange sex for protection

    f.   Physical prowess solves adaptive problem of protection

    g.   Large sex difference cross-culturally and across history

8. Preference for good health

    a.   Mating with unhealthy person posed many risks:

        1.   Unhealthy mate faced higher risk of becoming debilitated, failing to deliver expected valuable resources
        2.   Unhealthy mate faced increased risk of dying, cutting flow of resources & forcing new mate search
        3.   Unhealthy mate might transfer diseases or viruses
        4.   Unhealthy mate might infect children of union
        5.   If health heritable, unhealthy person might pass genes for poor health to children

    b.   Men and women, across cultures and time periods, place high premium on good health

    c.   Preference for good health widespread in animal kingdom

    d.   Body and facial symmetry: honest signal to health, preferred especially by women in potential mates

        1.   Facially symmetric people score higher on physical, psychological, and emotional health
        2.   Positive relationship between facial symmetry and judgements of physical attractiveness
        3.   Facially symmetric men judged to be more sexually attractive to women, have more sex partners, have more EPCs, and begin sex earlier in life

9. Preference for love

    a.   Cue to long-term commitment of time, attention, resources to woman and children

    b.   Love is recognized and experienced across cultures—not a recent invention

    c.   Acts of love signal commitment (Buss, 1988)

      d.   Commitment has many components

            1.   Fidelity—emotional and sexual
            2.   Channeling of resources
            3.   Emotional support
            4.   Reproduction

      e.   Buss (1989): "Mutual attraction—love" most highly valued by both men and women across cultures

  10. Preference for willingness to invest in children

      a.   Adaptive problem women face when selecting LT mate is gauging men's willingness to invest in children

      b.   An adaptive problem because:

            1.   Men sometimes seek sexual variety, and so may channel efforts to other women rather than toward children
            2.   Men evaluate likelihood that they are genetic parent of child and withhold investment from child when question paternity
            3.   Thus, men differ in willingness to invest in particular child—women need to gauge this

D.   Context Effects on Women's Mate Preferences

   1.   Effects of women's personal resources on women's mate preferences

      a.   Structural powerlessness hypothesis (Bus & Barnes, 1986)

      b.   Weight of evidence does not support—but note Kasser & Sharma, 1999

   2.   Effects of Temporal Context on Women's Mate Preferences

      a.   Buss & Schmitt (1993); Women rated following qualities as more desirable in LT than ST partner:

            1.   Ambitious and career-oriented
            2.   College graduate
            3.   Creative
            4.   Devoted to you
            5.   Fond of children
            6.   Kind
            7.   Understanding
            8.   Responsible
            9.   Cooperative

E.   How Women's Mate Preferences Affect Actual Mating Behavior

   1.   For preferences to evolve, they must affect actual mating behavior

2. However, don't expect perfect correspondence with mating behavior:

    a. There are a limited number of highly desirable potential mates
    b. One's own MV limits access to those who are highly desirable
    c. Parents and kin sometimes influence mating decisions, regardless of personal preferences

3. But must have been some correspondence between preferences and behavior for preferences to have evolved:

4. Women's responses to men's personal ads

    a. Older men receive more responses

    b. Men with more education and income received more responses

5. Women's marriages to high status men

    a. Physically attractive women marry men who are higher in social status and financial holdings than do less attractive women

    b. Taylor & Glenn, 1976: Physical attractiveness correlated with occupational prestige of husband

6. Women's marriages to men who are older

    a. Cross-culturally, women express desire for men who are older—3.42 years cross-culturally

    b. Actual age difference in 27 of 37 cultures secured—2.99 years

V. Men's Long-Term Mating Strategies

A. Theoretical Background for Evolution of Men's Mate Preferences

    1. Why men might benefit from commitment and marriage

        a. Women's mating desires set ground rules—no commitment, no mate!

        b. Increase in quality of woman man able to attract

        c. Increase in paternity certainty

        d. Increase in survival of man's children—e.g., Ache children whose fathers died suffered death rate 10% higher than children whose fathers remained alive

        e. Increased RS of children accrued through paternal investment

    2. The problem of assessing a woman's fertility and reproductive value (RV)

        a. Men can't observe women's RV directly, so selection could only have designed preferences in men for qualities that are correlated with RV

       b. Comparing humans with close primate relatives, chimps, see discontinuity in female advertisement of reproductive status: estrus versus concealed ovulation

           1. Unlike chimps, women's ovulation is concealed or cryptic

           2. Unlike chimps, sexual activity in humans not concentrated during time female most likely to conceive

       c. Transition from advertised estrus to concealed ovulation posed adaptive problem for human ancestral males

           1. For chimps males, problem of detecting female's reproductive status is easy

           2. Concealed ovulation in humans shifted problem from one of detecting ovulation to determining which women were capable of reproducing

           3. This is problem of determining woman's RV or fertility

           4. RV: # of children person of given age and sex likely to have in future

           5. Fertility: Current likelihood of producing viable children

           6. RV and fertility not directly observable

           7. But men might have evolved mechanisms sensitive to observable qualities of a woman that are correlated with RV or fertility

           8. For example, woman's youth and health—but which observable qualities signal woman's youth and health?

           9. Do men's desires in spouse focus on her reproductive capacity?

B.   The Content of Men's Mate Preferences

    1. Preference for youth

       a. Powerful cue to RV

       b. Across historical periods, from 1930s to 1990s, men seek younger spouses than do women—about 2.5 years younger

       c. Across all 37 cultures, men seek younger spouses—about 2.5 years younger

       d. Personal ads—as man ages, he prefers women who are increasingly younger

       e. Teenage males prefer as dates females who are slightly OLDER, as expected

    2. Evolved standards of physical beauty

       a. Standards of female beauty embody cues to women's RV

b. Conventional wisdom suggests that beauty is in eyes of beholder, but eyes and minds behind eyes have been shaped by evolution

c. Instead, beauty is in the adaptations of the beholder!

d. Our ancestors had access to 2 types of observable evidence of woman's RV:

   1. Features of physical appearance
   2. Features of behavior

e. Cross-culturally, cues to ill health and older age perceived as less attractive

f. Women's and especially men's attractiveness ratings of female facial photos decrease with increasing age of target

g. Standards of beauty emerge early in life—Langlois et al, 1990:

   1. Adults evaluated color slides of female faces for attractiveness
   2. Infants shown pairs of faces differing in attractiveness
   3. All infants gazed longer at attractive faces
   4. 12 month olds showed more observable pleasure, more play involvement, less distress, and less withdrawal when interacting with strangers wearing attractive versus unattractive masks
   5. 12 month olds played longer with facially attractive dolls than with unattractive dolls

   6. Challenges commonly held view that standards of attractiveness learned through gradual exposure to current cultural models

h. Standard of beauty are consistent across cultures

   1. Cunningham et al, 1995: Average correlation of attractiveness ratings of female photos across racial groups = .93

   2. Taiwanese and American ratings correlated .91

   3. Blacks and Whites ratings of same faces correlated .94

   4. Much additional evidence for cross cultural consistency of attractiveness ratings

i. "Average" and symmetrical faces are more attractive

3. Female waist-to-hip ratio

   a. Before puberty, boys and girls show similar fat distributions
   b. At puberty, dramatic change: men lose fat from buttocks and thighs, whereas release of estrogen in pubertal girls causes fat deposition on hips and upper thighs
   c. Volume of fat in hips region is 40% greater for women than men
   d. WHR is similar for sexes before puberty, about .85-.95
   e. After puberty, women's hip fat deposits cause WHRs to become much lower than men's

f. Healthy, reproductively capable women have WHRs between .67 and .80, whereas healthy men have WHR around .85-.95

g. Much evidence indicates that WHR is accurate indicator of women's reproductive status

   1. Married women with lower WHRs have harder time getting pregnant, and if pregnancy occurs it does at later age

   2. WHR is good indicator of long-term health status: in women, higher WHRs associated with diabetes, hypertension, heart attack, stroke, gallbladder disorders

h. WHR is powerful part of women's attractiveness

i. Cross cultural evidence supportive

j. Sex difference in importance of physical attractiveness

   1. Across time periods in U.S. (1930s to 1990s): Men valued attractiveness and good looks in spouse more than did women

   2. But importance of attractiveness has increased for both sexes from 30s to 90s—corresponding to increase in mass media, and suggesting role of cultural evolution

   3. Across all 37 cultures, men value physical attractiveness in potential spouse more than did women

k. Solutions to the problem of paternity uncertainty

   1. Cryptic ovulation in humans presented adaptive problem for men by decreasing paternity certainty

   2. Marriage may have provided one solution to this adaptive problem

   3. But with marriage comes adaptive problem of mate's potential sexual infidelity

   4. Ancestral men could have solved adaptive problem of cuckoldry by seeking at least 2 qualities in mate:

      a. Desire for premarital chastity
      b. Desire for postmarital sexual fidelity

   5. In U.S. from 30s to 90s, men value chastity more than women, but this preference has decreased for both sexes

   6. Across 37 cultures, about 2/3 showed sex difference in valuing chastity, always men more than women

      7. From man's reproductive perspective, more important cue than virginity to paternity certainty is reliable signal of future fidelity

      8. U.S. men place premium on sexual fidelity—rate it most important of 67 traits in potential spouse

      9. U.S. men regard unfaithfulness as least desirable trait in spouse

      10. Spouse's sexual infidelity is rated as most upsetting cost spouse can inflict—cross-culturally

C. Context Effects on Men's Mate Mating Behavior

    1. Men in positions of power

      a. Men place a premium on youth and beauty in a spouse, but not all men are successful in realizing these desires

      b. Men lacking status and resources have most difficult time attracting desirable women and may settle for less than their ideal

      c. Historical and cross-cultural evidence from kings, despots, and other men of high status and wealth

        1. Marry younger women
        2. Kings and despots routinely stocked harems with young, attractive women and had sex with them frequently
        3. High status men in U.S select much younger wives
        4. In modern Western culture, man's occupational status is best predictor of physical attractiveness of his wife
        5. In study of German dating service, men who made more money sought correspondingly younger partners

    2. Context effects from viewing attractive models

      a. Advertisers exploit the universal appeal of young, beautiful women

      b. Exploitation not done with political motives to advance a single, unreachable standard of beauty, but instead it's done to make money—and it works!

      c. Young, attractive women tickle male and female psychological mechanisms and help sell merchandise

      d. Exposure to onslaught of media images can have real, potential negative consequences

        1. Kenrick et al, 1994: After men looked at photos of very attractive women or women of average attractiveness, they were asked to evaluate current mate

        2. Men who viewed pics of very attractive women, compared with those who viewed pics of women of average attractiveness:

        a.   Rated partners as less attractive

        b.   Rated self less committed to, less satisfied with, less serious about, and less close to partner

    3.   Findings replicated with Playboy centerfolds

    4.   Reason for changes attributable to unrealistic nature of images and to EPMs of men

    5.   What men see in media and in, e.g., Playboy, are most attractive women in most attractive pose with most attractive background in most attractive airbrushed photo

    6.   Contrast with ancestral environment—doubtful any ancestral man ever saw this many attractive women in one place over a short period of time

    7.   Presence of relative abundance of attractive women, however, might induce man to consider switching mates, and so he would decrease commitment

    8.   Women also victims of mass media—causing wildly high levels of intrasexual competition for greater attractiveness and youthfulness

D.   Effects of Men's Preferences on Actual Mating Behavior

    1.   Men's responses to women's personal ads (Baize & Schroeder, 1995)

        a.   Younger women received more responses than did older women

        b.   Mentioning physical attractiveness or sexual attractiveness produced more responses from men

    2.   Age preferences and marital decisions

        a.   Actual marriage decisions confirm preference of men for women who are increasingly younger than they are as the men age

        b.   American grooms exceed brides by 3 years at 1st marriage, by 5 years at 2nd marriage, and 8 years at 3rd marriage

        c.   In all cultures studied by Buss (1989), men on average are older than women they marry

    3.   Effect of men's mate preferences on women's attraction tactics

        a.   Mate attraction tactics (Buss, 1988): Appearance enhancement

        b.   Intrasexual deception tactics (Tooke & Camire, 1991): Attractiveness deception

        c.   Rival derogation tactics (Buss & Dedden, 1990): Physical appearance and sexual fidelity

VI. Short-Term (ST) Sexual Strategies

A.   Introduction: Clarke & Hatfield (1989)

B. Theories of Men's ST Mating (STM)

    1. Adaptive benefits to men of STM

        a. Trivers' (1972): Sex differences in STM due to sex differences in minimum PI

        b. Direct reproductive benefits to men pursuing STM

    2. Potential costs to men of STM

        a. STDs

        b. Social reputation as "womanizer"—could impair success at finding desirable LT mate

        c. Lower chances of offspring survival due to lack of paternal investment

        d. Violence from jealous husbands

        e. Violence from fathers, brothers of women

        f. Retaliatory affairs by wives and potential for costly divorce

    3. If benefits of STM > costs, selection will have favored STM

    4. Expect selection to favor male psychological mechanisms sensitive to costs

    5. Pursuing STM involves solving many specific adaptive problems...

    6. Adaptive problems men must solve when pursuing STM

        a. Problem of partner number or variety

            1. Solution: Desire for sexual access to many women
            2. Solution: Relaxation of standards in ST mate
            3. Solution: Impose minimum time constraints to sex

        b. Problem of sexual accessibility

            1. Time, energy, courtship resources provided without exchange of sex interfere with STM
            2. Expect men to have adaptations that predict sexual accessibility and motivate pursuit of best prospects

        c. Problem of identifying which women are fertile

            1. Men seeking ST mates predicted to prefer women displaying cues to high fertility
            2. Men seeking LT mate predicted to prefer women displaying cues to high RV

        d. Problem of avoiding commitment

          1.   Larger the investment in particular woman, the fewer sex partners man can attract
          2.   Men seeking ST mates predicted to avoid women requiring LT commitment before consenting to sex

C.   Evidence for an Evolved STM Psychology

   1.   Physiological evidence of evolutionary history of STM

      a.   Testicle size

          1.   Large testes evolve as consequence of intense sperm competition (SC)
          2.   SC exerts selection pressure on males to produce large ejaculates with many sperm
          3.   Relative testes size and mating system
              a.   Gorilla, polygyny, .018
              b.   Orangutan, monogamy, .048
              c.   Chimp, polygynandry, .269
              d.   Human, social monogamy, .079

      b.   Variations in sperm insemination (Baker & Bellis, 1995)

          1.   More time couple spends apart since last sex, more sperm inseminated at next sex
          2.   100% of time together = 389 million, 5 % of time together = 712 million
          3.   Sperm increase does NOT depend on total time since last ejaculation or even since last sex—time apart is key

      c.   Different sperm morphs: Egg getters and Kamikaze sperm

          1.   Greater proportion of kamikaze with greater risk of SC
          2.   Greater proportion of kamikaze = fewer sperm retained at next sex

  2. Psychological evidence of evolutionary history of STM

    a.   Desire for a variety of sex partners (Buss & Schmitt, 1993)

        1.   Next year: men = 6, women = 1
        2.   Next 3 years: men = 10, women = 2
        3.   Lifetime: men = 18, women = 5

    b.   Time elapsed before seeking sex (Buss & Schmitt, 1993)

        1.   Both men and women seek sex after 5 years
        2.   All shorter intervals, men seek more than women
        3.   1 week: men likely to seek sex, women highly unlikely
        4.   1 hour: Men slightly disinclined to seek sex, women report it is virtual impossibility

    c. Lowering of standards in STM

        1.   High standards exclude majority, low standards ensure more eligible partners
        2.   Buss and Schmitt, 1993: College men accept age range 4 years wider than women for STM (Men = 16-28, women = 18-26)
        3.   Wider age range doesn't hold for LTM

4. Men express lower standards for 41 of 67 traits desirable in STM
5. Women rate 1/3 of set of undesirable traits as more undesirable in STM
6. Men rate 4 traits as more undesirable than do women in STM: low sex drive, unattractive, need for commitment, hairy

    d. Closing time phenomenon

1. As closing time approaches, men view women as more attractive
2. Controlling for alcohol consumption

    e. Sex differences in sexual fantasies

1. Men twice as many than women
2. Men more likely to dream about sex
3. Men's sexual fantasies more likely to include strangers, multiple partners, anonymous partners
4. During single fantasy, men report changing partners, women rarely report
5. 32% of men, 8% of women report fantasies with 1,000 different partners
6. 33% of men, 18% of women report group sex fantasies
7. Men's fantasies highly visual, women's focused more on setting, emotions
8. Women's fantasies often revolve around familiar partners; emotion and personality crucial

D. Behavioral Evidence of STM

1. Extramarital affairs

    a. Cross-culturally, men pursue extramarital affairs more than women
    b. Kinsey et al, 1948, 1953: 50% of men, 26% of women
    c. Gap may be narrowing

1. Athanasiou et al., 1970: 40% of women, 36% of women
2. Hite, 1987: 75% of men, 70% of women
3. Neither samples representative
4. Hunt, 1974, representative sample: 41% of men, 18% of women

2. Prostitution

E. Women's STM

1. Evidence for women's STM

    a. Introduction: If ancestral women never engaged in STM, men could not have evolved powerful desire for sexual variety
    b. Female orgasm

1. On average, women eject 35% of sperm within 30 min of insemination
2. With orgasm, retain 70%, ejecting only 30%
3. "Upsuck" hypothesis of female orgasm (Baker & Bellis, 1993, 1995)
4. Number of sperm retained (via orgasm) greater with EPC than IPC
5. Affairs occur during most fertile point of cycle

      c.   Behavioral evidence of extramarital affairs

F.   Hypotheses about Adaptive Benefits to Women of STM

   1.   Resource hypotheses

      a.   Immediate resource extraction
      b.   Confusing paternity = resources from multiple men
      c.   Protection
      d.   Social status enhancement

   2.   Genetic benefit hypotheses

      a.   Enhanced fertility
      b.   Superior genes
      c.   Different genes

   3.   Mate switching hypotheses

   4.   Mate skill acquisition hypotheses

   5.   Mate manipulation hypotheses

G.   Costs to Women of STM

   1.   Impairing desirability as LTM if acquire reputation for promiscuity
   2.   Risk of physical and sexual abuse
   3.   Risk of getting pregnant and bearing children without benefit of investing man—children also less likely to survive
   4.   Unfaithful women risks withdrawal of resources by husband, physical abuse, murder
   5.   STDs—reproductively damaging

H.   Empirical Tests of Hypothesized Benefits to Women of STM

   1.   Women who engage in STM place premium on men's physical attractiveness—consistent with genetic benefits hypotheses
   2.   Women elevate importance of immediate resources in STM—supports resource accrual hypotheses
   3.   Women who have affairs are less happy than women who don't--supports mate switching hypothesis
   4.   Greiling & Buss (in press)

      a.   Hypotheses supported: Mate switching, Mate expulsion, Resources
      b.   Hypotheses receiving little or no support: Status enhancement, Increasing mate's commitment
      c.   Genetic benefits hypotheses not tested

I.   Contexts Effects on STM

   1.   Individual differences in women's STM (Greiling & Buss, in press)

2. ST maters see 4 classes of benefits as more beneficial:

    a. Sexual resources: having sex partner willing to experiment, orgasms with sex partner, great pleasure because of partner's attractiveness
    b. Improving skills of attraction and seduction
    c. Immediate resources
    d. Acquiring better LTM—financial resources and genes

3. Other contexts likely to affect STM

    a. Transitions across life

        1. STM most common at adolescence—means to assess value on mating market?
        2. Transition points between different LT mateships: Reassess value on mating market?

    b. Sex ratio: Eligible men relative to eligible women

        1. Key factors: wars, risk-taking, intentional homicide, different remarriage rates
        2. When surplus of women: STM, divorce
        3. When surplus of men: LTM, less divorce

    c. Effects of self-perceived mate value and self-esteem on STM (Lalumiere et al., 1995)

        1. High MV men, relative to low MV men:

            a. Had sex at earlier age
            b. More sex partners since puberty
            c. More sex partners in past year
            d. More sexual invitations in past 3 years
            e. Report less need for commitment before sex
            f. Score higher on SOI, index of STM

        2. In contrast, no relationship between women's MV and STM
        3. But, self-esteem predicted women's STM; Lower self-esteem predicted:

            a. More sex partners since puberty
            b. More sex partners in past year
            c. More one-night stands
            d. Preference for ST sexual relationships
            e. Higher scores on SOI

        4. Self-esteem did not predict men's STM

VII. Problems of Parenting

A. Offspring as "genetic vehicles" and likelihood of evolution of mechanisms motivating parental care

B. But not all species engage in parental investment (PI)

    1. PI is costly
    2. Benefits of OPI must outweigh costs of PI

C.   Remarkably little work on PI in humans

D.   Why do mothers provide greater PI than fathers?

   1.   Paternity Uncertainty Hypothesis
   2.   Abandonability Hypothesis

      a.   Female PI > male PI in species with internal female fertilization
      b.   Male PI > female PI in species with external fertilization
      c.   Data support, BUT:
          1.   Paternity uncertainty higher in species with internal female fertilization
          2.   Simultaneously gamete release: expect equal prevalence of female > male PI, but greater male PI more prevalent

   3. Mating Opportunity Costs Hypothesis
      a.   Expect greater PI by sex with greater MOC
      b.   Data supportive: fish, insects, birds, mammals

E.   An Evolutionary Perspective on Parental Care

   1.   Parental favoritism: PI greater in offspring where PI yields greatest return on investment
   2.   Evolved mechanisms of PI sensitive to at least 3 contexts:

      a.   Genetic relatedness to offspring
      b.   Ability of offspring to convert PI into parental fitness
      c.   Alternative uses of resources available for investment in offspring

   3.   Genetic Relatedness to Offspring

      a.   Who are newborn babies said to resemble?
      b.   Who do 1-year old babies actually resemble?
      c.   Parent's investment in kid's college education
      d.   Child abuse and other risks of not living with both genetic parents
      e.   Child homicide as a function of genetic relatedness to offspring

   4.   Offspring's Ability to Convert PI into Reproductive Success

      a.   Parental neglect and abuse of children with birth defects
      b.   Maternal care and health of child
      c.   Age (reproductive value) of child

   5.   Alternative Uses of Resources Available for PI

     a.   Women
        1.   Age and infanticide
        2.   Marital status and infanticide
        3.   Infanticide NOT an adaptation, but a reverse assay of PI

     b. Men
        1.   Parental effort vs. mating effort

      a. Sex differences in decision rules evaluating tradeoff between PI and mating effort—Why?

         1. Men benefit more than women in gaining sexual access to additional mates
         2. Paternity uncertainty

      b. Prediction: Women channel more effort and energy than men to parenting versus mating

      c. Cross-cultural evidence supports prediction

         1. Time holding infant
         2. % day spent caring for infant
         3. Single parenting
         4. Pupillary dilation to pictures of infants
         5. Identifying own infants via smell
         6. Identifying infant emotions
         7. Men's parenting effort as mating effort

F. Summary: Evolutionary Perspective of PI

   1. 3 key contexts affecting PI

      a. Genetic relatedness to offspring
      b. Ability of offspring to convert PI into survival and reproduction
      c. Alternative ways parents could use resources available for PI

   2. Evidence that all 3 contexts important

      a. Parents invest more in genetic than stepchildren
      b. Fathers invest less in children than mothers
      c. Healthy, high RV offspring receive greater investment than less healthy, low RV offspring
      d. Men provide less direct PI than women, and channel more effort into mating

G. Theory of Parent-Offspring Conflict (Trivers, 1974)

   1. PI is limited
   2. In sexually reproducing species, offspring share 50% of genes with parents, 50% with full siblings, but 100% with self
   3. Offspring desire larger portion of parent's resources than parents want to give

H. Mother-fetus conflict in utero

   1. Nutritional provisioning
   2. Spontaneous abortion and hCG
   3. Food supply via blood—fetus acts to increase maternal blood pressure, even at risk of harm to her

VIII. Problems of Kinship

A.   "Gene's eye" perspective

B.   General hypothesis derived from Inclusive Fitness theory (IFT): Selection will favor mechanisms designed to help close kin > distant kin > strangers

C.   Human psychology of kinship: Much theory, little data—Why?!

   1.   Kin more difficult to study than strangers, available in mass subject pools
   2.   In industrial world, we often have little interaction with extended kin
   3.   Favoritism toward kin so obvious that researchers blind to it, or don't consider it research-worthy

D.   Theory and Implications of Inclusive Fitness

   1.   Hamilton's Rule

      a.   IF = direct + indirect fitness effects
      b.   Hamilton's (1964) Rule: ENS favors mechanisms for altruism when: $c < rb$
      c.   Hamilton's rule defines conditions under which aid to kin can evolve—an evolvability constraint
      d.   Before Hamilton's Rule, acts of altruism puzzling

   2.   Theoretical Implications of H's Rule

      a.   Key implication of IFT is that specialized psych adaptations evolved for each relationship that recurred over evolutionary history

      b.   Siblings
         1.   Competition for PI
         2.   Sulloway (1996): birth order and family niche

      c.   Full siblings vs. Half-siblings
         1.   Holmes and Sherman (1982): ground squirrels
         2.   Humans? No research!

      d.   Grandparents and grandchildren

      e.   Hypotheses about universal aspects of kinship (Daly, Salmon, & Wilson, 1997)

         1.   All kin will be classified in reference to a focal person—e.g., my parents are not your parents

         2.   All kinship systems will make distinctions along lines of sex and generation

         3.   Kin relations will be universally organized according to dimension of "closeness" and closeness will linked to genetic overlap

         4.   Degree of cooperation between kin will be function of genetic overlap

         5.   Elder members of extended family will encourage younger members to behave more altruistically toward collateral than is their natural inclination

6. One's position in extended kin network will be key feature of self-concept

7. People everywhere will be aware of who their "real" relatives are

8. Kinship terms will be used to manipulate others, even when no kinship involved

E. Empirical Support for Implications of IFT

1. Alarm calling in ground squirrels (Sherman, 1977, 1981)

    a. Alarm caller at increased risk of predation—Hypotheses for apparent altruism:

        1. Predator confusion hypothesis
        2. Predator deterrence hypothesis
        3. Reciprocal altruism hypothesis
        4. PI hypothesis
        5. IF hypothesis

    b. Results

        1. Predators not confused by alarm call and not deterred, honing in on alarm caller—rules out 1 and 2
        2. Alarm calling not linked with length of relationship squirrel has with others in area, nor with familiarity between alarm callers and beneficiaries—rules out 3
        3. Males disburse, females stay with natal group
        4. Females call more often—consistent with 4 and 5
        5. Critical test: Do females without offspring still call? Yes, if have relatives in vicinity.
        6. Supports IF hypothesis most clearly

2. Patterns of Helping among LA Women (Essock-Vitale & McGuire, 1985)

    a. 300 adult women, ages 35 to 45, 2,500 instances of receiving help and 2,600 instances of giving help

    b. Results support predictions derived from IFT:

        1. Helping exchanges more likely to occur with close kin than with distant kin
        2. Helping among kin preferentially channeled to those of higher reproductive value (younger > older)

3. Life or Death Helping among Human
(Burnstein et al, 1994)

    a. Imaginary scenarios with college students from USA and Japan
    b. Varied genetic relatedness, reproductive potential, substantial vs. trivial help

    c. Results:
        1. Helping decreased with degree of genetic relatedness; stronger in life-or-death scenario

  2. Helping in life-or-death scenario declined with potential recipient's age—reversed in trivial scenario
  3. Why 1-yr-olds helped more than 10 yr-olds (latter have greater RV)?

4. Patterns of Inheritance—Who Leaves Wealth to Whom? (Smith, Kish, & Crawford, 1987)

   a. 3 predictions:
      1. People will leave more to genetically related kin and spouses than to unrelated people
      2. People will leave more to close kin than to distant kin
      3. People will leave more to offspring than to siblings—former likely to have greater RV

   b. 1,000 wills, half from men and half from women
   c. All 3 predictions supported

5. Investment by Grandparents

   a. Paternity uncertainty is key
   b. According to IFT, predictions for grandparental investment (GI), from grandchild's perspective:

      Mother's mother (MoMo) invest most, father's father (FaFa) invest least, with FaMo and MoFa intermediate

   c. DeKay (1995) and Euler & Weitzel (1996) tested behavioral and psychological indicators of GI in USA and Germany, respectively

   d. Predicted pattern found

   e. Also, in both studies, MoFa > FaMo—differential GI not attributable to simple sex difference in investment

F. The Evolution of the Family

   1. What is a family?

   2. Emlen (1995): Families are "those cases where offspring continue to interact regularly, into adulthood, with their parents"

   3. 2 types of families:
      a. Simple—a single parent or conjugal pair in which only one female reproduces
      b. Extended—groups in which 2 or more relatives of same sex may reproduce

   4. Presence of breeding male not essential to definition of family

   5. Defining feature of all families is that offspring continue to live with parents even after capable of reproducing on own

   6. Families are rare—only 3% of all birds and mammals

   7. Why are families so rare? Families inflict 2 key costs on offspring:

     a. Reproduction is delayed and sometimes directly suppressed
     b. Competition for resources (e.g., food) is concentrated, making life more challenging for offspring and parents

8. 2 major theories proposed to explain evolution of families:

     a. Ecological constrains model—families emerge when scarcity of reproductive vacancies that might be available to sexually mature offspring

     b. Family benefits model—families emerge because of benefits reaped by offspring:

          1. Enhanced survival via aid and protection from family members
          2. Enhanced ability to compete subsequently
          3. Possibility of inheriting or sharing family territory or resources
          4. IF benefits gained by being in position to help and be helped by genetic relatives

9. Emlen's (1995) theory synthesizes 2 major theories; 3 premises:

     a. Families form when more offspring are produced than there are available reproductive vacancies

     b. Families form when offspring must wait for available reproductive vacancies until they are in a good position to compete for them

     c. Families form when the benefits of straying at home are large

10. Predictions from Emlen's (1995) theory

     a. Family dynamics and kinship cooperation

          1. Families will form with shortage of reproductive vacancies but will break up vacancies open up
          2. Families that control many resources will be more stable and enduring than families that lack resources
          3. Help with rearing young will be more prevalent among families than among comparable groups lacking kin relatives
          4. Sexual aggression be low in families compared with groups of non-relatives because relatives will evolve to avoid risks of inbreeding

     b. Changes in family dynamics due to loss or disruption of existing breeder

          5. When breeder is lost because of death or departure, family members will get into conflict over who will fill the breeding vacancy
          6. Loss of existing breeder and replacement by who is genetically unrelated to family members already present will produce increase in sexual aggression

11. Davis & Daly's (1997) critique of Emlen (1995)

     a. 3 considerations that provide unique context for examining human families:

          1. Human families may remain together because of competition from other groups

2. Humans engage in extensive social exchange based on reciprocal altruism with non-kin
3. Non-reproductive helpers, such as post-menopausal women, have little incentive to encourage offspring to disperse, which may help to stabilize families

    b. Emlen's (1995) theory might be revised for special case of human families

        1. Prediction 1—post-menopausal women?
        2. Prediction 3—extensive reciprocal exchange among women in form of childcare
        3. Modify P3: <u>Unreciprocated</u> help with rearing young will be more prevalent among families than among comparable groups lacking kin relatives

IX. Cooperative Alliances

A. Evolution of Cooperation

    1. The problem of altruism

        a. How can altruism among nonrelatives evolve, given selfish designs that tend to be produced by NS?
        b. An "altruistic" design feature aids reproduction of others, even though it causes altruist to reproduce less

    2. Theory of Reciprocal Altruism (RA)

        a. Psych mechanisms for providing benefits to nonrelatives can evolve if benefits reciprocated in future
        b. In RA, both parties benefit more than if acted alone
        c. RA = Cooperation between 2 or more individuals for mutual benefit
        d. Synonyms for RA = Cooperation, reciprocation, social exchange
        e. Key adaptive problem for RA is ensuring that benefits are returned in future: Problem of cheating

    3. Tit for Tat

        a. Problem of RA similar to game called "Prisoner's dilemma":

Player B

	Coop.	Defect
Coop.	R = 3 Reward for mutual coop.	S = 0 Sucker's payoff
Defect	T = 5 Temptation to defect	P = 1 Punishment for mutual defection

Player A

<u>Note</u>: T > R > P > S and R > (S + T)/2

    b. Logical course of action, no matter what one's partner does, is to defect, even though coop. would result in best outcome for both

    c. Prisoner's dilemma resembles problem of RA

        1. If game played only once, sensible solution is to defect

        2. Axelrod & Hamilton (1981): Key to cooperation occurs when game is repeated but neither player knows when game will end, as in real life

        3. Winning strategy in "iterated PD games" is "tit for tat"—2 simple rules:

            a. Cooperate on first move
            b. Reciprocate on every move thereafter

        4. 3 keys to success of tit for tat:

            a. Never be first to defect
            b. Retaliate immediately after other defects
            c. Be forgiving

B.   Examples of Cooperation in Nature

   1. Food sharing in vampire bats (Wilkinson, 1984)

   2. Reciprocity among non-human primates

      a. Baboons (Packer, 1977): Male RA and sexual access to females

      b. Vervet monkeys (Seyfarth & Cheney, 1984)

         1. Females who had been groomed recently by solicitor more likely to look toward speaker in response to played-back request for aid
         2. Results apply only for non-kin

   3. Chimpanzee politics (de Waal, 1982)

C.   Social Contract Theory (Cosmides & Tooby, 1992)

   1. Theory of RA predicts that organisms can benefit be engaging in cooperative exchange

   2. Problem: Many potential exchanges do not occur simultaneously; thus:

   3. Relationships involving reciprocal exchange are vulnerable to cheating—then people take benefit without paying cost of reciprocation

   4. Evolution of RA requires mechanisms that detect and avoid cheaters

   5. What specific problems must be solved for evolution of mechanisms that motivate forming social contracts and avoiding cheaters?:

6. Cosmides & Tooby (1992) outlined 5 cognitive capacities:

    a. Ability to recognize many different individuals
    b. Ability to remember some aspects of histories of interactions with different individuals
    c. Ability to communicate one's values to others
    d. Ability to model values of others
    e. Ability to represent costs and benefits, independent of particular items exchanged

7. Empirical work on SCT

    a. Consider logic problem (Wason, 1966)

            A   B   2   3

    Which cards do you need to turn over to test rule: "If a card has a vowel on one side, then it has an even number on the other side." Turn over only those cards required to assess whether rule is violated.

    b. 90% of people get wrong
    c. 10% get correct: Turn over "A" and "3"
    d. Why are people so bad at solving logic problems of this sort?
    e. According to C & T, people have not evolved to respond to abstract logic problems, instead:
    f. People have evolved to respond to problems structured as social exchanges presented in terms of costs and benefits

    g. Consider this problem:

    You are a bouncer at a bar and your job is to make sure no one who is underage drinks alcohol. You have to test rule: "If a person is drinking alcohol, then he or she must be 21 or older." Which people must be checked to see if rule violated?

            Beer   Soda   25   16

    h. 90% get right: Beer and 16 year old
    i. Logic is same as previous problem—why are people so good at solving this problem but not abstract problem?
    j. According to C & T, key is to structure problem as a social contract

D. The Psychology of Friendship

1. So far we've discussed 2 paths to evolution of cooperation and altruism

    a. Kin selection
    b. Reciprocal altruism

2. Tooby & Cosmides (1996) suggest third avenue for evolution of cooperation and altruism in context of friendship

3. Should altruism be defined according to the cost incurred?

    a.   According to theories of kin selection and RA, altruism not considered to have occurred unless individual who gives benefit incurs cost

    b.   Why not focus instead on evolution of mechanisms designed to deliver benefits to others, regardless of whether costs incurred by person delivering benefits?

    c.   From an evolutionary perspective, greater the cost to a person of delivering benefits to others, less widespread delivering such benefits will be

    d.   Less costly it is to deliver benefits to others, more widespread they will be

    e.   Once adaptations for delivering benefits to others have evolved, further evolution will act to minimize costs, or even make it beneficial to actor to deliver benefits

    f.   Thus, large class of altruistic mechanisms unexplored—mechanisms designed to deliver benefits to others when actions stemming from them are least costly and most beneficial to the actor

    g.   Takes us out of realm of kin selection and RA and into "banker's paradox"

4. Banker's Paradox (BP)

    a.   BP: Those who need money most desperately are same people who are worst credit risks; so bank loans money to those who need it least, refusing to loans to those who need it most

    b.   BP similar to adaptive problem faced by ancestors

    c.   Each person has limited help to dispense. When someone most urgently needs help, however, is time when they are least likely to be able to reciprocate

    d.   What adaptations might regulate these crucial decisions?

        1.   People should be able to evaluate whether person they help will be _willing_ to repay in future

        2.   People should be able to evaluate whether person they help will be _able_ to repay in future

        3.   Is helping this person best use of limited capacity to help, relative to others who might be better investments?

        4.   Problem: How might we induce others to help us when we need it most?

5. Becoming irreplaceable as solution to banker's paradox

    a.   How might one act to increase odds of becoming irreplaceable and thus an attractive object of investment for others?

        1.   Promote reputation that highlights one's unique or exceptional abilities

        2.   Be motivated to recognize personal attributes that others value but that they have difficulty getting from others

        3.   Cultivate specialized skills

        4.   Preferentially seek out people or groups that most strongly value what one has to offer and what others in group tend to lack

        5.   Avoid groups where one's uniquenesses are not valued or where one's unique attributes are easily provided by others

        6.   Drive off rivals who threaten to offer benefits that one alone previously provided

    b.   No empirical work yet, although intuitively sensible

6. Costs and Benefits of Friendship (Bleske & Buss, 1999)

       a. Collected 2 sources of info. from participants:

           1. Perceptions of how beneficial (or costly) various items would be if received from a friend
           2. Reports of how often they received these benefits (or costs) from friends

       b. Hypothesis: For men more than women, one function of opposite-sex friendships (OSFs) is sexual access. Results:

           1. Men evaluated sexual access as more beneficial than did women
           2. Men reported experiencing unreciprocated attraction to OSF more often than women
           3. Women more often than men reported having OSF who was romantically attracted to them but not vice versa
           4. Men were denied sexual access to OSF more than women

       c. Hypothesis: For women more than men, a function of OSF is to provide protection. Results supportive

       d. Hypothesis: OSFs function to provide info. about opposite sex. Results:

           1. Both men and women report receiving info. about opposite sex more often from OSFs than SSFs
           2. Men and women reported that receiving info. about opposite sex from OSFs more beneficial than receiving such info. from SSFs

       e. Hypothesis: Men and women will perceive intrasexual rivalry as a potential cost of SSFs. Results supportive

    7. Distinguishing between benefits and functions of friendship

X. Aggression and Warfare

A. General Learning Mechanisms, Plagues of Modern Living as Causes of Aggression

    1. Contemp. psych. theories of aggression invoke general learning mechanisms combined with evils of modern living—violence on TV, teachings of Western society, toy guns

    2. NOT complete explanations, give cross-cultural, historic evidence

       a. Paleontological findings
       b. Prevalence of aggression in traditional societies

    3. Another explanation needed—one that doesn't rely on TV violence, mass media, Western society, toys, crowding, problems of modern living

B. Demise of Instinct Theory (Freud, Lorenz)

    1. Aggressive energy is an instinctual that builds up until explodes

    2. May be "released" by external stimuli, but internal building quality guarantees that it will be "pushed out" one way or another

3. Humans show behavioral flexibility and context sensitivity—discard notions of inflexible aggressive instincts

4. BUT neither are humans passive receptacles for environmental factors, unformed lumps of clay until modeled by reinforcement contingencies

5. More complex model needed—one anchored in EP

C. Aggression as a Solution to Adaptive Problems

1. Co-opt the resources of others

2. Defend against attack

3. Inflict costs on intrasexual rivals

4. Negotiate status and power hierarchies

5. Deter rivals from future aggression

6. Deter long-term mates from sexual infidelity

D. The Context-Specificity of Aggression

1. Example: Spousal battery as solution to adaptive problem of partner's sexual infidelity

2. Adaptive benefits must be evaluated within the context of costs

    a. Aggression leads to retaliatory aggression
    b. Reputational consequences of being aggressed against
    c. Ability and willingness of victim to retaliate
    d. Reputational consequences of using aggression

3. Evolved mechanisms sensitive to context; aggression not rigidly expressed as depicted in early instinct theories

4. Findings of variability of aggression across contexts, cultures, and individuals does not falsify EP hypotheses

5. Instead, context-sensitivity allows for testing EP hypotheses

E. Why are Men More Violently Aggressive Than Women?

1. Cross-culturally and historically, men are overwhelmingly the perpetrators and victims of aggression and homicide—Why?

2. PI theory, minimum PI, intrasexual competition

3. Humans are effectively polygynous—increases payoff of risk strategies for males without mates

F.   Empirical Evidence for Distinct Adaptive Patterns of Aggression

  1.   Evidence for sex differences in same-sex aggression

     a.   Meta-analysis of sex differences in aggression (Hyde, 1986)
     b.   Effect size: Lg. = .8, med. = .5, sm. = .2
     c.   Results:

          Aggressive fantasies = .84
          Physical aggression = .60
          Imitative aggression = .49
          Willingness to shock = .39

  2.   Same-sex homicides

     a.   In every culture, rate of male-male homicide far exceeds female-female homicide
     b.   Proportion male same-sex homicides = .85 – 1.00, mean = about .95

  3.   Same-sex bullying in schools (Ahmed & Smith, 1994)

     a.   Middle- and high-school students
     b.   Sex differences in victim of bullying, perpetration of bullying, various forms of bullying

        1.   Middle school bullying: 54% of boys, 34% of girls
        2.   High school bullying: 43% of boys, 30% of girls
        3.   Interaction of sex with type of bullying:
           a.   Physically hurt by bullying? High school boys = 36%, girls = 6%
           b.   Belongings taken? High school boys = 10%, girls = 6%

        4.   Girls bullied more than boys on 2 measures:

           a.   Others called nasty names: 74% of girls, 57% of boys
           b.   Others spread rumors: 30% girls, 17% boys
           c.   Sex differences in content of verbal aggression, esp. in high school

  4. The "Young Male Syndrome" (Wilson & Daly, 1985)

     a.   Young men most prone to engaging in risky aggression
     b.   Homicide rates: Through age 10, no sex difference in victimization
     c.   At adolescence, homicide risk increases dramatically for males, to peak at mid-20s (men 6 times more likely to be murdered)
     d.   From mid-20s, men's victimization rates plummet
     e.   By 75, sexes converge

  5. EP of YMS?

     a.   Sexual selection and mate acquisition
     b.   Cultivating reputation—can last lifetime; unique to humans?

G.   Contexts Triggering Men's Aggression against Men

    1.   Marital and employment

    2.   Status and reputation

    3.   Sexual jealousy and intrasexual rivalry

H.   Contexts Triggering Women's Aggression against Women

    1.   Intrasexual rivalry

        a.   Buss & Dedden (1990): physical appearance, promiscuity
        b.   Context-dependence of women's intrasexual derogation

I.   Contexts Triggering Men's Aggression against Women

    1.   Non-lethal violence against mates—sexual jealousy as leading cause

    2.   Lethal violence against mates—sexual jealousy

        a.   Suspicions of infidelity
        b.   Termination of relationship

    3.   Woman's age as risk factor

    4.   Violence as control of mate's sexuality

J.   Contexts Triggering Women's Aggression against Men

    1.   No sex difference in % of men and women who physically aggress against mate

    2.   Contexts differ: Women aggress in self-defense or in desperation

    3.   Male sexual jealousy often key factor

K.   Warfare

    1.   Cross-culturally documented

    2.   Coalitional warfare exclusively male

    3.   Intended victims are male, though women and children frequently suffer also

    4.   Although few wars are initiated for purpose of capturing women, gaining copulations usually viewed as desired benefit of defeating enemy

    5.   EP of Warfare (Tooby & Cosmides, 1988)

        a.   War is an intensely cooperative activity

        b.   Only 2 species of mammals observed to form aggressive coalitions against members of own species: Humans and chimps

      c.   Reproductive benefits of war must exceed costs for war to occur and for war psychology to evolve

      d.   4 conditions must be met for adaptations to evolve for initiating coalitional aggression:

           1.   Avg. long-term gain in reproductive resources must outweigh reproductive costs of war over evolutionary time

           2.   Members of coalitions must believe that their group will win

           3.   Risk that each member takes and impt. of each member's contribution to victory must translate into corresponding share of benefits

           4.   Men who go to battle must be cloaked in "veil of ignorance" about who will live or die

  6. Predictions generated from T & C's Theory of EP of War:

      a.   Men, but not women, will have EPMs designed for coalitional warfare
      b.   Sexual access to women will be primary benefit that men gain joining male coalitions
      c.   Men should have EPMs that lead them to panic and defect from coalitions when death appears to be imminent result of remaining
      d.   Men more likely to go to way when odds of success appear high
      e.   Men should have EPMs designed to enforce the "risk contract"—to detect and punish cheaters, defectors, and traitors
      f.   Men should have EPMs designed to detect, prefer, and enlist men in the coalition who are willing and able to contribute to its success

  6.   Evidence consistent with T & C's theory:

      a.   Men, but never women, engage in warfare
      b.   Men are more likely to spontaneously assess their fighting ability (Fox, 1997)
      c.   Sexual access as a recurrent resource that flows to victors (Palmer & Tilley, 1995, on gangs)

L.   Do Humans Have Evolved Homicide Modules?

XI. Conflict between the Sexes

A.   Strategic Interference Theory (SIT; Buss, 1989)

  1.   SI occurs when one person employs a strategy to achieve goal and another person prevents successful enactment of that strategy

  2.   If woman adopts strategy of delaying sex until she feels emotional commitment from man, and man persists in sexual advances after woman indicates desire to wait, result is interference with woman's sexual strategy

  3.   At same time, delays imposed by woman interfere with man's ST mating strategy of seeking sex sooner

4. Men and women come into conflict not because they are competing for same resources, as occurs in same-sex SI, but because strategy of one sex can interfere with strategy of the other

5. SIT applies not just to conflicts about timing of sex—conflict pervades all relations between sexes, from contact in workplace and dating scene to marital arguments

6. Key point: SI—blocking strategies and violating desires of another—is predicted to pervade interactions between sexes, from strangers to intimate partners

7. Second component of SIT: "negative" emotions such as anger and distress are key human psych. solutions that evolved to solve adaptive problems posed by SI

   a. Emotions highlight problematic events, focusing attention on them and screening out less relevant events

   b. Emotions mark these events for storage in and easy retrieval from memory

   c. Emotions lead to action, causing person to strive to eliminate source of SI

8. 2 qualifiers of SIT:

   a. Conflict per se serves no adaptive purpose

      1. Conflict is undesirable outcome of fact that sexual strategies of men and women differ
      2. Men and women cannot simultaneously reach their goals or pursue desired sexual strategies without coming into conflict

   b. Metaphor "battle between the sexes" can be misleading

      1. Implies that men as group are united in interests and women are likewise united in interests and 2 groups somehow at war
      2. Nothing farther from truth!
      3. Men cannot be united with all other men because men are in competition primarily with members of own sex
      4. Same is true for women

B. Conflict over Sexual Access

   1. Inferences about sexual intent

      a. Men sometimes infer sexual interest on part of woman when it does not exist

      b. Men interpret simple friendliness and mere smiling as indicating more sexual interest than women viewing exactly same events

      c. When in doubt, men infer sexual interest; men act on their inferences, occasionally opening up sexual opportunities

      d. If over evolutionary history even a tiny fraction of these led to sex, men would have evolved lower thresholds for inferring women's sexual interest

      e.   Women sometimes exploit this feature of male evolved psychology

2. Deception about commitment

      a.   Buss (1994): 71% of men vs. 39% of women report deceiving about emotional commitment to have sex

      b.   Buss (1994): 97% of women vs. 59% of men report being target of this deception

      c.   Among humans, costs of being deceived about potential mate's resources and commitment are greater for women

      d.   Because the deceived can suffer serious losses, must have been powerful selection pressures for evolution of vigilance to detect and prevent deception

      e.   Current generation is one cycle evolutionary arms race between deception perpetrated by one sex and detection of deception by the other sex

      f.   Women have evolved strategies to guard against deception

          1.   Requiring extended time, energy and commitment before consenting to sex
          2.   Same-sex "gossip" about intentions of potential sex partner

3. Sexual harassment (SH)

      a.   Disagreements over sexual access occur not just in dating and marriage, but also in workplace, where people seek ST and LT mates

      b.   SH can range from unwanted staring and sexual comments, to physical violations

      c.   SH produces conflict between sexes and is result of differences between men's and women's evolved psychologies

      d.   Hypothesis that SH is product of evolved sexual strategies is supported by profiles of typical victims, their reactions to SH, and conditions under which they were harassed

      e.   Victims of SH overwhelmingly women; perpetrators overwhelmingly men

      f.   Although any woman may be target of SH, victims are overwhelmingly young, physically attractive, and single

      g.   Reactions to SH follow logic predicted by EP: When men and women asked how they would feel if co-worker of opposite sex asked to have sex, 63% of women said would be insulted, 17% flattered; 67% of men flattered, only 15% insulted

      h.   Distress that women experience to SH varies with status of harasser—higher status, less distress

      i.   In sum: Men have evolved lower thresholds for seeking sex without commitment and lower thresholds for perceiving sexual intent, and these EPMs operate in work context no less than any other social context

      j.   Women have evolved psychological patterns of anger and distress in reaction to SH—emotions that presumably neutralize SI or lower likelihood of occurrence in future

4. Sexual aggressiveness (SA)

      a.   SA, vigorous pursuit of sexual access despite woman's reluctance or resistance, can take forms other than SH

      b.   SA is one strategy men use to minimize costs they incur for sexual access, although this strategy carries costs in form of retaliation and damage to reputation

      c.   Men consistently underestimate how distressing SA is to women

5. Sexual withholding (SW)

      a.   Men consistently complain about women's SW, such as being sexually teasing, saying no to sex, leading man on sexually and then stopping him

      b.   Although both sexes bothered by SW, men bothered much more than women

      c.   For women, SW serves several possible functions:

           1.   Preserve ability to choose men of high quality who are willing to commit emotionally and invest materially
           2.   Manipulate men's perceptions of woman's value as a mate
           3.   Encourage a man to evaluate a woman as LT rather than ST mate

C.   Jealous Conflict

      1.   One of key LT mate preferences of men is sexual fidelity in partner

      2.   Preference in part evolved to solve problem of paternity uncertainty

      3.   There are indeed many potential benefits to women of extra-pair sex, including resources, good genes, and potential for better mate

      4.   Profound source of conflict between sexes is that between husband's desire for exclusive sexual access to wife, and wife's desire for sex with other men

      5.   In short, potential for conflict between sexes over cuckoldry

      6.   Potential for cuckoldry creates serious adaptive problem for males that is magnified in humans because of high investment men often channel to children

      7.   If man is cuckolded, costs include:

           a.   Loss of investment to rival's offspring
           b.   Loss of partner's investment, now channeled to rival's offspring
           c.   Loss of energy and effort devoted to selecting and attracting partner

      d.   Loss of status and reputation among men and women, impairing ability to attract other mates

8.   EPs hypothesize that sexual jealousy is one psych. mechanism that evolved in men to combat costs of cuckoldry

9.   Jealousy in men might solve adaptive problem of cuckoldry in several ways:

      a.   Sensitize man to circumstances in which partner might be unfaithful, promoting vigilance
      b.   Prompt actions designed to limit partner's contact with other men
      c.   Prompt man to increase own efforts to fulfil partner's desires so she will have less reason to be unfaithful
      d.   Prompt man to fend off rivals who show sexual interest in partner

10. Clear prediction is that man's jealousy should focus heavily on potential SEXUAL contact partner might have with other men

11. Women also face adaptive problem because of partner's infidelity, but it is not defined by compromise of maternity certainty

12. Because men channel investments and resources to women with whom they have sex, a husband might devote time, attention, and energy to another woman and her children rather than to his wife and her children

13. Thus, EPs hypothesize that women's jealousy will focus on cues to LT diversion of man's commitments, such as his becoming EMOTIONALLY involved with another woman

D.   Sex Differences in Jealousy

1.   Work on jealousy uninformed by EP documented in several dozen studies that sexes experience jealousy with equal frequency and intensity

2.   Buss, Larsen, Westen, & Semmelroth (1992): Which is more distressing—partner's sexual infidelity or emotional infidelity?

      a.   Self-report data
      b.   Psychophysiological data
      c.   Clear, consistent sex differences

3.   Sex differences replicated in Germany, the Netherlands, Korea, and Japan

E.   From Vigilance to Violence: Tactics of Mate Retention (MR)

1.   Evidence that men and women have EPMs that generates jealousy helps us understand how they might have solved adaptive problems of partial or total loss of partner

2.   PMs can only evolve, however, if produce behavioral output that solves adaptive problem

3.   In case of jealousy, output would have to:

      a.   Deter partner from committing infidelity, or

      b.   Lower odds that partner will defect from relationship

4. Buss (1988) and Buss & Shackelford (1997) studied tactics of MR in dating and married couples

5. 19 tactics of mate MR, including vigilance over partner's whereabouts, mate concealment, emotional manipulation, resource display, love and care, and violence toward partner

6. Sex differences in use of MR tactics

      a.   Men more than women use:

           1.   Mate concealment
           2.   Threats and violence, especially against rivals
           3.   Resource display

      b.   Women more than men use:

           1.   Appearance enhancement
           2.   Jealousy induction

7. Contexts influencing intensity of MR tactics (Buss & Shackelford, 1997)

      a.   Perceived likelihood of infidelity—men's, but not women's MR positively linked to perceived likelihood of spousal infidelity

      b.   Reproductive value of wife—effects of age and physical attractiveness

           1.   Men's, but not women's, MR correlated with partner's age and attractiveness
           2.   Men's assessment, but not interviewers' assessments, of wife's attractiveness correlated with MR

      c.   Income and status striving of husband

8. Violence toward partners

      a.   Men use violence to limit partner's autonomy, thus decreasing odds that partner will commit infidelity or defect from relationship

      b.   Indeed, women who leave their partners are often pursued, threatened, assaulted, and killed

      c.   Women who have left husband are at much greater risk for being killed than women who remain with husband

      d.   Younger women—women of higher RV, are at greatest risk of violence and murder by partner

      e.   Rates of wife-battery and wife-killing highest among men without resources

      f.   Wife-battery and presence of extended kin

F.   Conflict over Access to Resources

    1.   Women's mate preferences and men's competitive tactics as causes of resource inequality

    2.   Same-sex competition is powerfully linked with conflict between sexes

    Example: Women's efforts to maintain or enhance physical attractiveness

    3.   Women and men exploit desires of opposite sex

    Example: Prostitution

XII. Status, Prestige, and Social Dominance

A.   Overview

1.   Status, prestige, respect accorded differentially to people in all known groups and cultures

2.   People expend great energy attempting to gain status and avoid status loss

3.   Status-striving is key human motive—indeed, key motive among all social animals

B.   Emergence of Dominance Hierarchies

1.   Crickets remember their history of successes and failures in fights with other crickets

2.   If tends to win fights, becomes more aggressive; if loses, becomes submissive, avoiding fights

3.   Alexander (1961): After losing to "model" cricket, more likely to lose fights with real crickets

4.   Each cricket formed estimate of fighting ability relative to others and behaved accordingly

5.   Dominance hierarchy emerged—each cricket could be assigned rank order, with crickets lower in hierarchy giving in to those higher

6.   Similar phenomena occur throughout animal world

7.   "Pecking order" and hens

8.   Pecking order stable over time, with benefits for each hen

9.   Dominant hens gain because don't have to continuously fight to defend rank

10. Subordinate hens gain because avoid injury that would occur from fighting dominant hens

11. NOTE: Pecking order or dominance hierarchy does not have function per se

12. Hierarchy is property of group, not individual

13. Strategies of each individual hen have function, and in aggregate produce stable hierarchy

14. So, must consider functions of being submissive, as well as functions of being dominant

15. Fighting in every encounter with another is foolish strategy—loser risks injury and death, and would have done better to give in—giving up territory, mate, food

16. Fighting also costly for victor—risk injury, death, energetic resources, time, and forgone mating and feeding

17. So both losers and winners would have been better off if each could determine who would win in advance and declare winner without suffering costs of fighting

18. Selection will favor evolution of assessment abilities—psych. mechanisms that include assessment of own fighting ability relative to others

19. In humans, assessment mechanisms likely to assess more than physical strength, including ability to enlist powerful friends, network of social connections, and kin network of each combatant

20. Following assessment, strategies of dominance and submissiveness have functions—primary function of each is to avoid costly confrontations when outcome can be determined in advance

21. Dominance hierarchy refers to fact that some individuals within group gain greater access to recourses that contribute to survival and reproduction

22. Dominance hierarchies documented in variety of non-human animals—from crayfish to chimps

23. Chimps battle for dominance status

24. Dominance status among male chimps comes with key perk—increased sexual access to females

25. Dominant chimp in colony secures up to 75% of copulations, even when there are 6 other adult males

26. Increased sexual access by dominant males especially pronounced when females in estrus

27. Similar results found with orangutans and baboons

28. 2 other key features of primate dominance hierarchies

    a. Hierarchies not static

    b. Physical size is not primary determinant of rank—instead rising in hierarchy depends on social skills

C.   Evolutionary Theories of Dominance and Status

1.   A good evolutionary theory of dominance and status will:

    a. Specify adaptive problems that are solved by rising up hierarchies

    b. Address psychological design and behaviors associated with superior as well as subordinate positions in hierarchies

      c.   Predict which tactics people will use to negotiate hierarchies (academic vs. inner city)

      d.   Account for why status-striving appears to be more prevalent among males than females

2.   No complete theory exists, but progress has been made

D.   An Evolutionary Theory of Sex Differences in Status Striving

1.   The more polygynous the mating system, the stronger the selection pressures on males to become one of few who succeed in reproduction

2.   Additionally, selection will favor strategies that don't exclude individual from reproducing entirely

3.   Higher status can give males greater sexual access along 2 paths:

      a.   Dominant men preferred as mates by women

      b.   High status men can dominate other men

E.   Status and sexual opportunity

1.   Betzig (1993): Status and rank afforded men great sexual access to women in first 6 civilizations (Mesopotamia, Egypt, Aztec Mexico, Incan Peru, imperial India, imperial China)

2.   Modern times (Perusse, 1993): Higher status men gain greater sexual access to larger number of women—because of legally enforced monogamy, partners are ST and EPC partners

3.   High status men marry younger, more physically attractive women

4.   In sum, empirical evidence supports evolutionary rational for predicting sex difference in strength of motivation to achieve high status

F.   Are men higher in status striving?

1.   Whiting & Edwards (1988): Across 6 cultures, boys more likely than girls to engage in rough-and-tumble play, assaults, displays of dominance, acts of seeking attention

2.   Maccoby (1990): 2 key sex differences in preschool years:

      a.   Rough-and-tumble play of boys and their orientation towards competition and dominance

      b.   Among boys, speech serves egoistic functions and is used to establish and protect turf; among girls, conversation is a social binding process

3.   Social Dominance Orientation (SDO), Pratto & Sidanius (1993)

      a.   SDO = preference, interest, and respect for social hierarchies

      b.   High SDO endorse ideology involving legitimacy of one group's domination over another, deservingness of discrimination and subordination of one group by another, and allocation of more perks to one group than another

c. Pratto et al. argue that SDO should be higher in men because high SDO led ancestral men to greater control of and access to women

d. In addition, women selected to choose as mates men high in SDO, because this would have led to benefits for them and their children

e. Men do consistently score higher than women in SDO—across cultures, incomes, education, political ideology

G. Men and women express dominance through different actions (Buss, 1981; Megargee, 1969)

1. Men tend to express dominance through acts of personal ascension whereby they elevate themselves to positions of power

2. Women tend to be less oriented toward personal striving for status over others, instead expressing dominance in service of group-oriented goals

H. Dominance theory (Cummins, 1998)

1. Begins with proposal that struggle for survival in human groups revolves around conflicts between those who are dominant and those trying to outsmart the dominant

2. Selection favors strategies that cause one to achieve higher status, but also favors subordinate strategies to subvert access of dominant individuals to key recourses

3. Subordinate strategies include deception, false subordination, friendship, and manipulation to gain access to resources needed for survival and reproduction

4. Cummins proposes that cognitive capacities to reason about minds of others evolved in primates— including humans--to thwart access to recourses by those high in dominance

5. Dominance theory has 2 key propositions:

a. Humans have evolved domain-specific strategies for reasoning about social norms involving dominance hierarchies; include understanding:

1. Permissions (e.g., who is allowed to mate with whom)

2. Obligations (e.g., who must support who in conflicts)

3. Prohibitions (e.g., who is forbidden to mate with whom)

b. These cognitive strategies evolved prior to, and separate from, other types of reasoning strategies

6. Reasoning about permissions, obligations, and prohibitions (deontic reasoning) emerges early in life (about 3 years)

7. When people evaluate deontic rules, they spontaneously adopt strategy of seeking rule violations

8. In contrast, when people evaluate indicative rules, they spontaneously look for confirmations of rule

9. Thus, 2 distinct forms of reasoning, developing by 3 years of age

10. Dominance theory predicts that human reasoning is influenced by status—some empirical support: Mealey, et al. (1996)

a. Showed participants pics of men along with information about social status (high vs. low) and character (history of cheating vs. trustworthiness)

b. Participants returned 1 week later and asked to report which pics they remembered

c. Cheaters were remembered more frequently than non-cheaters

d. Memory for cheaters especially enhanced if cheaters low in status, diminished if cheaters high in status

e. Memory bias for cheaters stronger for men than for women

f. Mealey et al. results support proposal that humans have evolved selective attention and memorial storage mechanisms designed for processing key social information—mechanisms especially sensitive to who has cheated and status of cheater

g. Mealey et. al results support Cummins's dominance theory, which proposes that human social reasoning is affected by rank

I. Social Attention-Holding Potential (SAHP) Theory (Gilbert, 1990)

1. SAHP theory proposes emotional mechanisms designed to solve adaptive problems posed by living in social hierarchies:

    a. Elation after rise in status

    b. Social anxiety in contexts in which status could be gained or lost

    c. Shame and rage as consequence of status loss

    d. Envy to motivate acquisition of what others have

    e. Depression to facilitate submissive posturing to avoid further attacks from superiors

2. Neat theory that needs much more empirical work

J. Correlates of dominance—much empirical research, little theory

1. Upright poster

2. Low, resonant voice

3. Direct eye contact

4. Fast-paced stride

5. Facial features such as strong jaw

6. Physical size

7. Hormone testosterone and neurotransmitter serotonin linked with dominance, but direction of causality not clear

8. Some evidence that testosterone increases after winning and decreases after losing

9. In chimps, serotonin decreases after status loss, as when others fail to give submissive greeting

10. Evolutionary functions of testosterone and serotonin not clear, but increases in both may play role in maintaining dominance and decreases may play role in avoiding dangerous status challenges

11. NOTE: Needed is a comprehensive theory of determinants of dominance

K.   Strategies of Submissiveness

1. Low status presents adaptive problems that must be solved

2. Deceiving down (Hartung, 1987)

    a. Consider people stuck in position they perceive as unfair or beneath their social status—e.g., man who holds job he knows does not take full advantage of his talents

    b. Acting like job is beneath you could jeopardize employment—boss might fire you for insubordination

    c. Adaptive solution proposed by Hartung is "deceiving down"

    d. Deceiving down is NOT "playing dumb" or pretending to be less than you are—instead, involves actual decrease in self-confidence to facilitate acting submissive, subordinate

    e. Evolutionary logic of deceiving down is that situations have commonly existed in which it was adaptive to convincingly portray oneself as subordinate, and hence non-threatening

    f. Those who are threats risk incurring wrath of dominant, who may wish to be rid of those perceived as potential rivals

    g. By truly acting subordinate, one avoids incurring this wrath, continuing to occupy position within group

    h. Permits one to bide one's time until opportune moment arises in which to seek dominant status

    i. Empirical work needed to test deceiving down hypothesis

3. Derogating tall poppies (Feather, 1994)

XIII. Toward a Unified Evolutionary Psychology

A. Overview

1. First look at how EP informs major branches of psychology

2. Next consider that future of an integrated psychology depends on dissolving traditional disciplinary boundaries, organizing field around adaptive problems

B. Evolutionary Cognitive Psychology

1. All psych mechs entail information-processing devices designed to solve adaptive problems

2. Because many adaptive problems that humans have faced over evolutionary history are social, cognitive psych must address ways in which we process information about other people

3. According to EP, the entire cognitive system is collection of interrelated information-processing devices, specialized to solve specific classes of adaptive problems

4. Traditional cognitive psych anchored by core assumptions that EP challenges

5. Mainstream cognitive psych assumes cognitive architecture is general-purpose and content-free

6. EPs make opposite assumption—mind consists of many specialized mechs, each designed to solve different adaptive problem

7. One consequence of mainstream cognitive assumption of general-purpose information-processing devices is that little attention paid to stimuli used in cognitive experiments

8. Cognitive psychs use stimuli based on easy of presentation and experimental manipulability

9. This leads to categorization studies that use shapes and symbols rather than "natural" categories such as kin, mates, or enemies

10. Use of artificial, content-free stimuli makes sense if mind is general-purpose information processor; makes less sense if cognitive mechs specialized to process information about particular tasks

11. 2 key problems with assumption of general processing mechanisms:

    a. What constitutes successful adaptive solution differs from domain to domain

    b. Number of behaviors generated by general mechanisms is infinite, so organism would have no way of determining successful adaptive solutions from among huge number of unsuccessful ones (combinatorial explosion)

12. Second key assumption of mainstream cognitive psych is functional agnosticism—that information-processing mechs can be studied in ignorance of adaptive problems they were designed to solve

13. In contrast, EP infuses study of human cognition with functional analysis

14. EP replaces core assumptions of mainstream psych with different assumptions that permits integration with rest of life science:

    a.   Human mind consists of set of evolved information-processing mechs embedded in nervous system

    b.   These mechs, and developmental programs that produce them, are adaptations produced by NS over evolutionary time in ancestral environments

    c.   Many of these mechs are functionally specialized to produce behavior that solves particular adaptive problems

    d.   To be functionally specialized, many of these mechs must be richly structured in content-specific ways

15. Sex Differences in Spatial Location Abilities

    a.   Well known that men show superior performance on spatial ability tasks that require mental rotation, map reading, maze learning

    b.   These and other sex differences in skills such as geometry hypothesized to have originated through sexual selection

    c.   Silverman et al. argued that these forms of spatial ability are those that would have facilitated hunting—task performed mainly by men over human evolutionary history

    d.   Women, in contrast, specialized in gathering, so Silverman et al. proposed that, contrary to previous work on spatial ability, women would be better on certain spatial tasks—those that would have facilitated gathering

    e.   Remembering where plants located in geographical space is one such ability

    f.   Silverman et al. conducted studies using artificial and natural stimuli to test hypothesis

    g.   Results consistent across studies—women outperformed men on spatial tasks involving location memory and object memory

    h.   Research suggests that there may be several distinct abilities included within domain of "spatial" and that these are more domain specific than previously thought

    i.   Research also suggests that studies of sex differences in spatial abilities benefit by considering nature of adaptive problems men and women faced over evolutionary history

    j.   Sex differences cannot be explained by global and hence incorrect characterizations of spatial abilities that ignore more modular processes

C.   Evolutionary Social Psychology

1.   Many of key adaptive problems humans have faced over evolutionary history are social in nature

2.   Human mind should be loaded with psych mechs dedicated to solving social adaptive problems

3.   Much of EP, therefore will be evolutionary social psych

4. Because most human social interaction has occurred in context of relationships, questions about psych of relationships should form core of social psych

5. Focus on relationships is in contrast to current mainstream social psych, which is "phenomenon" oriented—no overarching theory

6. 2 major routes to evolutionizing social psych:

    a. Capitalizing on evolutionary theories about social interactions

    b. Using EP as a heuristic to discovering important social problems

7. Capitalizing on Evolutionary Theories about Social Phenomena

    a. Inclusive Fitness Theory (Hamilton, 1964): grand implications for social psych of altruism, family, helping, coalitions, and aggression

    b. Sexual Selection Theory (Darwin, 1871): provides most promising theory for integrating sex differences in humans and other primates

    c. Parental Investment Theory (Trivers, 1972): already led to many key discoveries about human mating, parenting, and sex differences

    d. Reciprocal Altruism Theory (Trivers, 1971): friendship, mateship, other non-genetic relationships

    e. Parent-Offspring Conflict Theory (Trivers, 1974): critical heuristic for work on family relationships, especially parent-child relationships

8. Heuristic Value of Evolutionary Social Psychology

    a. Events surrounding reproductive activity should be prime targets for discovery of evolved psych mechs

    b. Kinship and family relations

    c. Other social relationships are critical in securing mateships and in acquiring resources that can be invested in kin: casual friends, true friends, reciprocal exchange partners, coalitional allies

D. Evolutionary Developmental Psychology

1. DP is not a branch of psych with a particular content attached to it

2. It is an approach to psychological phenomena that incorporates a temporal, life-span perspective

3. Because few psych mechs emerge fully developed at birth, developmental perspective will be essential part of complete understanding of most psych mechs

4. Key insight currently missing from mainstream DP: Humans face predictably different adaptive problems at different points in life

5. An Evolutionary Theory of Socialization (Belsky et al., 1991):

    a. Belsky et al. propose that father's presence or absence early in child's life can influence sexual strategy child develops later

    b. Those growing up in fatherless homes during first 5-7 years develop expectations that parental resources will not be reliably provided and that adult pair bonds will not be enduring

    c. These people cultivate sexual strategy marked by early sexual maturation, early sexual initiation, frequent partner-switching—strategy designed to produce many offspring, with low investment in each

    d. Extraverted and impulsive personality traits may accompany this strategy

    e. Other people perceived as untrustworthy, relationships as short-lived

    f. Resources sought from brief sexual encounters are opportunistically attained and immediately extracted

    g. Those with a reliably investing father during first 5-7 years develop different set of expectations about trustworthiness of others

    h. People are seen as reliable, trustworthy, and relationships expected to be enduring

    i. These early environmental experiences channel individuals toward LT mating strategy marked by delay of sexual maturation, later onset of sexual activity, interest in LT adult relationships, heavy investment in few children

    j. All theories of environmental influence rest on foundation of evolved psych mechs

    k. In this case, implicit psych mechs designed to take as input information about reliability of paternal investment, process that through set of decision rules, develop one of 2 possible psych models of world, and pursue one of 2 alternative mating strategies as output of mechs

E. Evolutionary Personality Psychology

1. Personality psych is broadest branch of psych

2. Historically, all "grand" theories of personality have hypotheses about contents of human nature at core, such as motives for sex and aggression (Freud)

3. At same time, personality psych also focused on enduring ways in which individuals differ

4. Most research and theory in EP has focused on species-typical psych mechs

5. Individual differences have been relatively neglected and pose greater challenge for EPs

6. Evolutionary biologists have tended to focus on species-typical adaptations, ignoring individual differences except in their role of providing raw materials on which ENS operates

7. Individual differences, particularly those that are heritable, often relegated to secondary status because thought to originate through nonselection forces such as random mutation

8. Genetic differences sometimes viewed as "noise" maintained in population because presumed to be unrelated to core of evolutionary process—adaptation and NS

9. These different conceptualizations are difficult to reconcile

10. Because NS tends to reduce genetic variability within populations by favoring some genes over others, why do behavioral genetic studies consistently find moderate heritability for personality traits?

11. If individual differences really are independent of adaptation and NS, why are individual differences reliably linked to activities closely connected to reproductive success, such as survival and sexuality?

12. If individual differences studied by personality psychs reliably linked with reproductively relevant phenomena, perhaps they play more important role in human EP than previously thought

13. EP now struggling with ways to incorporate individual differences and species-typical psych mechs within a unified conceptual framework

14. Alternative Niche Picking or Strategic Specialization

    a. Birth order (Sulloway): Non-heritable individual difference

15. Adaptive Assessment of Heritable Qualities

    a. Tooby & Cosmides (1990): "reactive heritability" (RH)

    b. RH of aggression based on body type

    c. RH of male ST vs. LT mating strategy based on physical attractiveness

16. Frequency-Dependent Adaptive Strategies

    a. In general, directional selection tends to use up heritable variation

    b. Heritable variants that are more successful tend to replace those that are less successful, resulting in species-typical adaptations that show little or no heritable variation in key components

    c. Key exception is frequency-dependent selection—in some contexts 2 or more heritable variants can be sustained in equilibrium

    d. Biological sex

    e. Within sex: sexual strategies

F. Evolutionary Clinical Psychology

1. Concept of mental disorder occupies key place in clinical psych

2. Clear criteria for identifying mental disorder are critical

3. Psychs often invoke terms such as adjusted, maladjusted, adaptive, maladaptive, normal, abnormal to identify mental disorder

4. But these terms lack clear definitional criteria and thus beg question why they imply mental disorder

5. Many researchers, theorists, indeed DSM, implicitly appeal to intuitions about what is good or bad, desirable or undesirable, to identify mental disorder

6. When explicit criteria for mental disorder are specified, often are simple heuristic rules, such as notions of subjective distress, bizarreness, social harmfulness, inefficiency

7. EP offers potential for escaping intuitive appeals by providing more rigorous set of explicit principles for identifying presence of disorder

8. Once an evolved psych mech described and proper function identified, clear criteria exist for identifying dysfunction:

9. Dysfunction occurs when mech not performing as it was designed to perform in contexts in which it was designed to function—e.g., blood fails to clot after skin cut

10. Evolved mechs can fail in 3 ways:

    a. Mech fails to become activated when relevant adaptive problem confronted

    b. Mech becomes activated in contexts in which it was not designed to become activated

    c. Mech fails to coordinate as it was designed to coordinate with other mechs

11. Evolutionary Insights into Problems Erroneously Thought to be Dysfunctions

    a. Although many human behaviors appear disordered, maladaptive, or subjectively distressful, they are not dysfunctions

    b. First, discrepancy between ancestral and modern environments—media exposure to attractive "rivals"—women's anorexia, bulimia

    c. Second, normal mistakes accompanying the "on average" functioning of mech—male inference of sexual interest when none exists

    d. Third, subjective distress produced by normal operation of evolved mechs—depression

    e. Fourth, socially undesirable behavior produced by normal operation of evolved mechs—psychopathy, child abuse by step-parents

12. Implications of evolutionizing clinical psych:

    a. Properly understanding design of mind increases likelihood you can fix it when it breaks down

    b. Evolutionary perspective provides guidance about when to intervene

G.   Evolutionary Cultural Psychology

1.   Many psychs perpetuate false dichotomy between "culture" and "biology," as if 2 in competition as explanations

2.   From EP perspective, "culture" cannot be viewed as separate cause because rests on foundation of evolved psych mechs

3.   Social scientists who study culture often start with observation that groups of people in one place differ in some ways from groups of people in other places

4.   Psychs note these differences and attribute them to "culture"

5.   They presume that "biology" refs to what is invariant across humans, "culture" refers to what is variable, so "culture" accounts for the variability

6.   According to EPs, patterns of within-group similarity and between-group differences require explanation

7.   Transforming these differences into an entity called "culture" confuses phenomena that require explanation with proper explanation for phenomena

8.   Must identify and describe underlying evolved psych mechs and adaptive problems they were designed to solve

9.   Need to distinguish evoked and transmitted culture

    a.   Evoked culture—phenomena triggered differentially in some groups more than others by differing environmental conditions

    b.   Evoked culture implies universal psych that is differentially activated

    c.   Transmitted culture refers to representations that originally exist in at least one person's mind that are transferred to other minds through observation or interaction

    d.   Phenomena of transmitted culture require specialized inference mechs in "recipients" that recreate representations in their minds

H.   Toward a Unified Psychology

1.   EP can inform traditional branches of psych

2.   Ultimately, however, EP can be expected to dissolve these traditional disciplinary boundaries

3.   Humans cannot be partitioned into discrete elements such as personality, social, developmental, and cognitive

4.   From perspective of EP, many traditional disciplinary boundaries are not just arbitrary, but misleading, detrimental to scientific progress

5. They imply boundaries that cleave mechs in arbitrary and unnatural ways

6. Studying human psych via adaptive problems and their solutions provides natural means of "cleaving nature at its joints" and hence crossing current disciplinary boundaries

7. Critical task of EP is identifying adaptive problems that humans recurrently faced over evolutionary history

8. EPs have just scratched the surface by identifying some of problems most obviously linked with survival and reproduction

9. Most adaptive problems not yet explored, most psych solutions not yet discovered

10. EP provides conceptual tools for emerging from fragmented state of psych science and linking psych with rest of life sciences in a move toward scientific integration

11. EP provides most important tools for unlocking mysteries of where humans came from and how arrived at current state, as well as mechs of mind that define what it means to be human