Evolutionary psychology

Human evolution has selected for a disposition toward certain behaviors that increased the fitness of individuals with them.

**Variation**: a population of people has individuals who exhibit behaviors A and B.

**Selection**: behavior A tends to lead to higher fitness than behavior B.

**Heritability**: there is at least some genetic influence on the likelihood that an individual is disposed toward A instead of B.

**Evolution**: the alleles that increase the likelihood of behavior A increase in frequency, that behavior becomes the wildtype.
Evolutionary psychology

**DANGER**: making up stories of behaviors A and B is very tempting.

e.g.: Humans are afraid of spiders because they can be poisonous. Men prefer younger women because they are more fertile.

Making up an explanation that is consistent is not enough, we need to be able to test hypotheses.

But, how to distinguish evolution from cultural factors and/or upbringing instead of evolution?

We need to test hypotheses with a more formal approach to keep from telling "just-so" stories.

We also want a formal approach to help us come up with less obvious processes.
Evolutionary psychology

**DANGER**: making up stories of behaviors A and B is very tempting. We need to test hypotheses with a more formal approach to keep from telling "just-so" stories.

We also want a formal approach to help us come up with less obvious processes.

Best tests are:
- Experiments with unconscious decisions. Minimizes conscious & cultural biases
  - spiders, snakes, outlets, cars
  - animals/objects
- Comparisons that show universal patterns. Minimizes culture-specific factors
  - youth, blemishes
  - group identity
Fitness components:

**Survival**: behaviors that improve mortality and health will be favored.

**Reproduction**: behaviors that increase the chance of acquiring mates are favored.

**Offspring rearing**: because human offspring require so much care and human resources are usually limited*, behaviors that favor the survival and quality of offspring are favored**.

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* Limited the number of offspring possible for most individuals.

** Fitness is often better measured by number of grandchildren.
Looking at these arenas we must keep 3 things in mind as we develop our hypotheses.

(1) Most of human evolution occurred in much less modern/technological societies, we must keep those contexts in mind.

(2) How would a behavior in those contexts translate into FITNESS differences between the behavior and alternatives?

(3) How can we use our hypothesis to make predictions we can use to test our hypothesis?
Context examples:

Most of human history humans lived in small social groups, with many relatives in close proximity.

Little formal centralized authority/law (police, etc.), high amounts of informal decentralized social bonds (reputation, gossip, etc.)

Little contact with outgroup individuals; interactions would often be confusing, aggressive or violent.

Modern understanding of genetic vs communicable disease absent.

Choices/mistakes can have **serious** consequences
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Type I error: $H_0$ true, but we reject
Type II error: $H_0$ false, but we accept

Some errors are much worse than others, especially when survival is involved.

- Not fearing a dangerous animal is worse than fearing a harmless one.
- Not staying away from a sick person is worse than avoiding a healthy one.

**smoke detector principle**: better to be overly cautious instead of overly daring.

Mismatches between perception and reality are particularly informative in this context.
Context:

Modern understanding of genetic vs communicable disease absent.

Little contact with outgroup individuals; interactions would often be confusing, aggressive or violent. Interactions would also be more likely to introduce new disease.

Explains innate desire to create in-groups and out-groups?

N. Ireland – religion vs tribe?

Babies & puppets

Abstract: Adults tend to like individuals who are similar to themselves, and a growing body of recent research suggests that even infants and young children prefer individuals who share their attributes or personal tastes over those who do not. In this study, we examined the nature and development of attitudes toward similar and dissimilar others in human infancy. Across two experiments with combined samples of more than 200 infant participants, we found that 9- and 14-month-old infants prefer individuals who treat similar others well and treat dissimilar others poorly. A developmental trend was observed, such that 14-month-olds' responses were more robust than were 9-month-olds'. These findings suggest that the identification of common and contrasting personal attributes influences social attitudes and judgments in powerful ways, even very early in life.
Hypothesis: the widespread phobia of snakes is an evolutionary adaptation because snakes are dangerous and fearing them conferred a survival benefit.

Sounds good, but how to test? How to separate from cultural factors?
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Evidence that "fear" can depend on evolutionary histories in other species:

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If true we should have more innate fear for old context threats than for modern threats.

Fear conditioning works better for ancient threats (snakes) than for modern ones (cars, power outlets).

People are better at detecting old objects than modern ones.
People are better at detecting old objects than modern ones. New, Cosmides & Tooby. 2007. PNAS 104: 16593-16603.

Time to spot animal and human differences faster than to spot inanimate object differences.
Hypothesis: the bias/disgust we have against foreign, unattractive or disfigured people is due to adaptation to avoid communicable diseases.

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If true, these prejudices should be increased when the risk from infectious disease is increased.

When primed to be concerned about health issues, people have stronger anti-immigrant attitudes (specifically "danger", not general "negativity"). Faulkner et al., 2004. *Group processes and Intergroup Relations* 7(4): 333-353.

Reproduction

Context:

Males: each mating inexpensive, males can produce 100+ offspring.

   Selection to increase number of partners and chance of reproduction from each one.

   Challenge = outcompeting other males

Females: each mating expensive, females are limited in # of offspring.

   Selection to increase quality of partners and amount of aid or resources they provide.

   Challenge = assessing & acquiring superior genetic quality
General prediction based on these differing selective pressures

Males should be promiscuous (to max # offspring)

Females should be choosy (to max quality of offspring)

There are numerous examples of this in other species and clear stereotypes for humans.

What we need are more nuanced and human focused hypotheses
Sometimes best evidence for evolutionary processes come from imperfections, seemingly sub-optimal or poorly-designed traits.

Hypothesis: a sexual smoke detector. Errors of judgment may be favored if they cause a person to err in the direction of reinforcing promiscuity or choosiness.

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Social error: misperception of sexual interest from another.

Males that perceive less sexual attraction than exists would be less fit than males that perceive too much (lusting errors harmless).

Females that perceive more inclination for commitment than exists would be less fit than females that perceive less (trusting errors serious).

Hypothesis: since males are selected to maximize the number of offspring they should be selected to mate with females most likely to produce offspring from such matings - women of optimal child-bearing age.

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One of the two strongest cross-cultural patterns is the male preference for younger women.

(Actual preference more nuanced, males target up or down toward maximum fertility age range)

Teen males prefer slightly older women
Hypothesis: since females are selected to be choosy they should have highly developed choice mechanism; they should be able to detect genetic quality quite well - beyond the obvious.

Since parasites, malnutrition and developmental problems can cause subtle perturbations in development, leading to slight asymmetries (fluctuating asymmetry, FA) females should prefer low FA males.

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Females can smell unwashed t-shirts and their preferred shirts are those from more symmetric males. Thornhill & Gangestead, 1999. *Evolution and Human Behavior* 20: 175-201.

Preference for blue eye color.
Imprinting effects: prefer traits of opposite sex parent.
Westermarck effect: prefer traits different from relatives.
Frequency dependent sexual selection (fdSs)
  - Negative: prefer rare types
  - Positive: prefer common types
Preference for blue eye color. no
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Humans are unusual among animals in the high amount of parental care provided to their offspring.

Although females clearly spend more energy producing (9 months pregnancy) and feeding (milk) the young, males provide resources to offspring and mate in terms of food, shelter, safety and child-care.

Neither males nor females can be secure:

Males have no guarantee an offspring is theirs. Females have no guarantee their male will stay a provider.
Neither males nor females can be sure, in particular:

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Females have no guarantee their male will stay a provider.

Many comparative studies indicate:

Jealousy: females focus on appearance of rival females 
males focus on social status of rivals

Infidelity: females are more concerned about emotional 
infidelity than sexual 
males are more concerned about sexual 
infidelity than emotional
Neither males nor females can be sure, in particular:

Males have no guarantee an offspring is theirs

Blue eyes are recessive.
Blue + blue = blue
Brown + blue = mixed

Can guarantee paternity
Paternity not guaranteed
Hypothesis: Females historically relied on males for resources. Females should therefore prefer males with resources so they can provide. (note: may also indicate genetic quality)

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The other strongest cross-cultural patterns is the female preference for males with resources.

Gaining resources takes time, older males tend to have more resources:

Females are selected to prefer older males. Males are selected to prefer younger females.
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Parental age difference and offspring count in humans

Martin Fieder\textsuperscript{1,*} and Susanne Huber\textsuperscript{2}

Figure 1. Mean offspring count (± s.e.) of Swedish men aged 45–55 years who did not change their partner between the birth of their first and last child versus age difference in years between the individual and his female partner as well as quadratic regression of means. Data for age difference more than 10 years are aggregated.
Offspring care

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Figure 2. Mean offspring count (± s.e.) of Swedish women aged 45–55 years who did not change their partner between the birth of their first and last child versus age difference in years between the individual and her male partner as well as quadratic regression of means. Data for age difference more than 10 years are aggregated.
Hypothesis: an individual’s fitness is not increased by spending resources on a non-biological child, they should provide less care to adopted children. (note: females typically know children are theirs, males are less sure)

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Does parental care for biological and adopted children differ?

The Cinderella effect

Canada (1974-1990), murder rate for children under 5 years old.

By biological father - 2.6 deaths per 1,000,000 child years
By stepfather - 321.6 deaths per 1,000,000 child years
This is a 120-fold difference

England & Wales: >100-fold difference.
Australia: >300-fold difference.
USA: ~100-fold difference

Hypothesis: if an individual's offspring differ in their quality, extra resources/care should be provided to those with best chance to produce offspring themselves - fitness is increased by maximizing # grandchildren.

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To the extent that sexual selection occurs in humans, more attractive children would be expected to have more offspring. More care should be paid to attractive children (more grandkids).

Watch people with children in grocery stores. Measure child attractiveness and adult attentiveness.
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Rate of cart seatbelt use:  

<table>
<thead>
<tr>
<th></th>
<th>female caretaker</th>
<th>male caretaker</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cute kids:</td>
<td>13%</td>
<td>12.5%</td>
</tr>
<tr>
<td>Ugly kids:</td>
<td>4%</td>
<td>0%</td>
</tr>
</tbody>
</table>

Ugly kids allowed to wander >10 feet away as well.  
426 kids observed, 14 stores in Canada

http://www.nytimes.com/2005/05/03/health/03ugly.html
Speculative evolutionary psychology hypotheses:

Has sexual selection for older males led to our unusually long life span?

Can display behavior in males explain the observed discrepancy in apparent creative/artistic/musical abilities between the genders?

Evolution explains why women go for the "bad guy" because this signals dominance/quality.