

**The New Science of Evolutionary
Psychology**

**Three theories of origins of complex
adaptive mechanisms**

2. Seeding theory

- **1. Creationism**
- **2. Seeding theory**
- **3. Evolution by natural selection**

Merits of Theory of Natural Selection

- 1. organizes known facts parsimoniously
- 2. provides guidance to important domains
- 3. leads to new predictions

Environment of Evolutionary Adaptedness

- Description of selection pressures (statistical composite)



Three products of the evolutionary process

- 1. Adaptations: inherited; reliably developing; produced by natural selection; solved adaptive problem.
 - Need not be present at birth (breasts)
 - Must have contributed to reproduction directly or indirectly

Example of Adaptation: Umbilical Cord

- **2. Byproducts of adaptations: belly button; nose for glasses; thoughts of death**
- **3. Noise: random effects due to mutations or perturbations during development**

Levels of Analysis in Evolutionary Psychology

- **Theory of natural selection** [modern form: inclusive fitness theory]
- **Middle-level evolutionary theories**
- **Specific evolutionary hypotheses**
- **Specific predictions derived from evolutionary hypotheses**

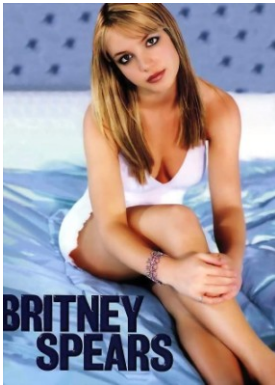
Two Strategies for Generating and Testing Evolutionary Hypotheses

- 1. Theory-driven or “top-down” strategy [parental investment theory]
- **A. Derive hypothesis from existing theory (Parental Investment)**
- **b. Test predictions based on hypothesis**
- **c. Evaluate whether results confirm predictions**

2. Observation-Driven or “bottom-up” strategy

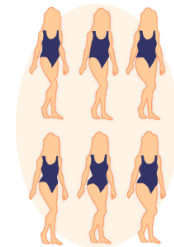
- a. Derive hypothesis based on known observation (Males value attractiveness)
- b. Test predictions based on hypothesis
- c. Evaluate whether results confirm predictions

a. Derive hypothesis based on known observation: Standards of attractiveness embody cues to fertility

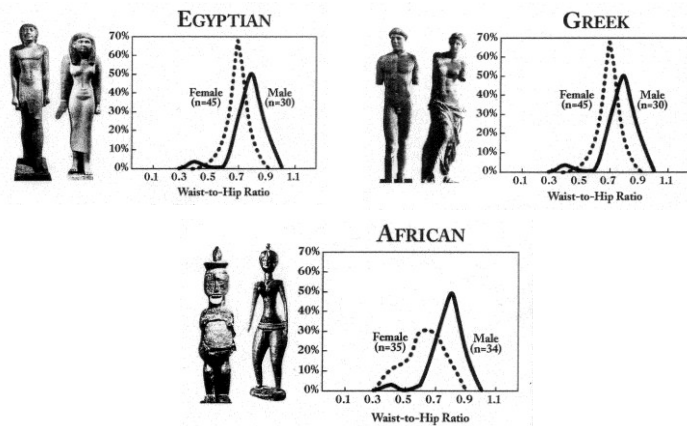


b. Test predictions based on hypothesis (WHR)

- c. Evaluate whether results confirm predictions



d. Test predictions across cultures.....



Core of Human Nature

- All species have a nature



Definition of evolved psychological mechanism

- Set of processes inside organism that :
 - 1. Exist in current form because it solved a specific problem of survival or reproduction recurrently over human evolutionary history: DESIGN FEATURES; LOCK AND KEY METAPHOR

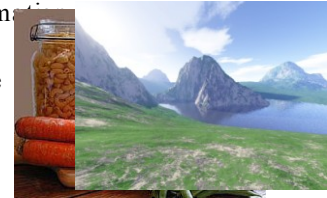


Definition of evolved psychological mechanism

- 2. takes in only narrow slice of information (food, landscape, mates)
- 3. input tells organism what a daptive problem it is facing



Mates



Landscape

Food

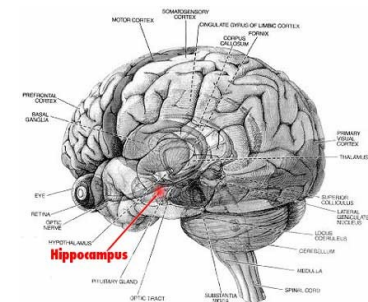
Definition of evolved psychological mechanism

- 4. input transformed via decision rules into output (IF, THEN)
- 5. output can be behavior, information, or physiological activity
- 6. output is directed toward solving an adaptive problem (ON AVERAGE)



Important Properties of Evolved Psychological Mechanisms

- 1. Provides non-arbitrary criteria for carving nature at its joints



2. Evolved psychological mechanisms tend to be problem-specific, not general.

- a. General solutions fail to guide organism to correct adaptive solutions
- b. General solutions produce too many errors and are costly
- c. General solutions cannot combat problem of combinatorial explosion.
- d. What constitutes a successful solution differs across domains
- e. Specificity, complexity, numerousness give flexibility: adaptations are enablers!

Are There “General” Evolved Psychological Mechanisms?

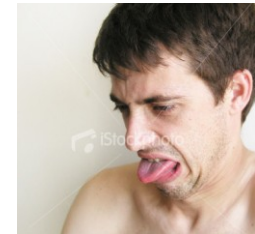
- There ARE likely to be super-ordinate mechanisms that regulate other mechanisms
- Unlikely that there are truly general mechanisms that are entirely domain-independent.
- But . . . some disagree, and argue that there are truly general mechanisms . . .

Learning and Culture

- Environmental input at every step in the causal chain
- Learning: Label or explanation?

Three Potential Learning Mechanisms

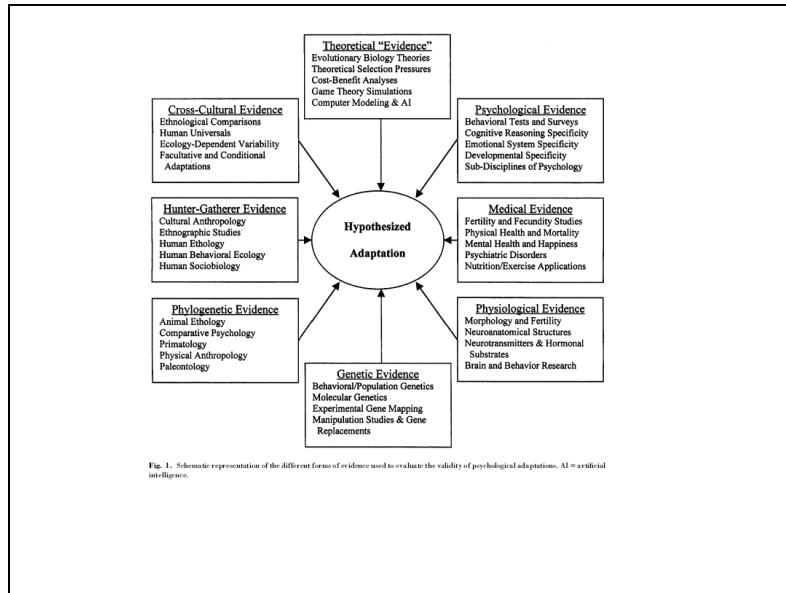
- Incest avoidance learning
- Food aversion learning
- Learned prestige criteria



Three Key Points About Learning

- 1. Labeling something as “learned” is a description, not an explanation.
- 2. “Learning” and “evolved” are not competing explanations; learning requires evolved psychological learning mechanisms
- 3. Evolved learning mechanisms are likely to be numerous, tailored to the specific learning problem that needs to be solved

Methods for Testing Evolutionary Hypotheses



Comparing different species: Sperm volume

The diagram compares sperm volume between humans and monkeys. It features two rows of sperm cells. The top row shows human sperm (large) and monkey sperm (small). The bottom row shows human sperm (large) and monkey sperm (small). To the left of the top row is a human figure, and to the right is a monkey figure. The text "Comparing different species: Sperm volume" is centered at the top.

Comparing males and females:
Different adaptive problems



**Comparing individuals within a species:
Age differences, economic differences**

**Comparing same individuals in
different contexts**

**Comparing same individuals in
different contexts**

**Sources of Data for Testing
Evolutionary Hypotheses**

Archeological records
**Data from hunter-gatherer
societies**
Self-reports
**Life history data and
public records**
**Human products (fast foods, skin
magazines, romance novels, movies)**

Life history data and public records



Transcending limitations of single data sources

Identifying Adaptive Problems

- Guidance from modern evolutionary theory
- Guidance from knowledge of human universals
- Guidance from traditional societies
- Guidance from paleoarcheology
- Guidance from current mechanisms
- Guidance from task analysis
- Organization of adaptive problems in book