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
  - 2. Takes in only narrow slice of information (food, landscape, mates)
  - 3. Input tells organism what adaptive problem it is facing
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

Fig. 2: schematic representation of the different types of evidence used to evaluate the validity of psychological adaptations. The verbal representation is notional and incomplete.
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