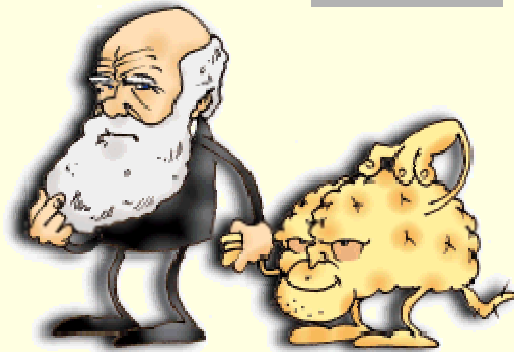


Evolution, Cognition, & Self-Deception



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Evolution, Cognition, & Self-Deception

- From Logos to Darwin
- From Darwin to Cognition
- Evolutionary Psychology
- Self-Deception

Motivation(s)...

- ✓ Interdisciplinary interests.
- ✓ Philosophical issues in evolutionary theory.
- ✓ Evolutionary theory and the study of mind & cognition.
- ✓ Empirical findings.
- ✓ Implications for:
 - reasoning
 - psychopathology
 - understanding ourselves

From Logos to Darwin

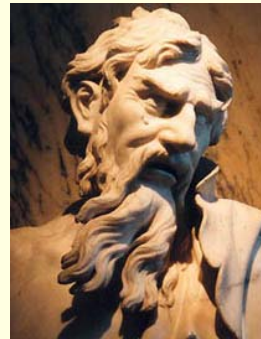
- How are mind and world connected?
 - ◆ Establishes the *possibility* of knowledge.
- Do we have extensive knowledge?
 - ◆ Not limited to reports of how things seem to us or to speculations about *a priori* knowledge...

From Logos to Darwin

- Want to show that it's possible to have knowledge based on...
 - perception,
 - memory,
 - testimony,
 - reasoning (including induction, deduction, probability assessments...)
- Interested in extensive, scientific ...
 - knowledge of the world
 - knowledge of ourselves

Heraclitus and the Logos

- Ancient Greek Cosmologists, first scientists (e.g., Thales).
- Metaphysical conjectures about the fundamental nature of the world & its intelligibility.
- Heraclitus (435-475 BCE) cited **the Logos**:
 - transcendent rational order
 - cosmic intelligence



Heraclitus and the Logos

- The Logos = metaphysical basis for connection between mind and world:
 - ◆ a kind of harmony or attunement
 - ◆ in terms of truth or rationality
 - ◆ normally-functioning human minds
- Makes knowledge possible and extensive.

Descartes: Clarity & Distinctness

- Rene Descartes (1596-1650) transforms philosophical inquiry.
- Aimed to bring certainty to the sciences.
- Mind & world are products of **Divine Creation**.
- Same strategy, different details.

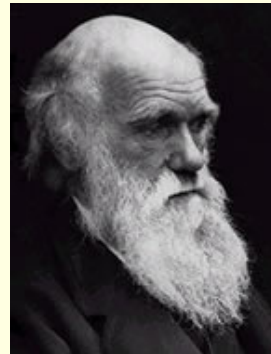


Descartes: Clarity & Distinctness

- Divine Creation:
 - ◆ deception, error, and untruth incompatible with God's nature.
 - ◆ an all-good God would allow Descartes to "get things right" at least sometimes... When?
 - ◆ General Rule: whatever he perceives clearly & distinctly to be true is true.
- basis for thinking that mind and world can be connected via common Divine Creation...
 - ◆ truthfulness, rationality, certainty = knowledge.
 - ◆ we have minds in order to decipher truth.

And then... Along came Darwin

- Darwin (1809-1882) offers new metaphysical worldview.
- rejects the Logos and Divine Creation.
- revolutionary idea in biology and other life sciences...
 - ◆ metaphysics & epistemology!
- ... revolutionary approach to human psychology ...





“In the distant future I see open fields for far more important researches. Psychology will be based on a new foundation, that of the necessary acquirement of each mental power and capacity by gradation. Light will be thrown on the origin of man and his history.”

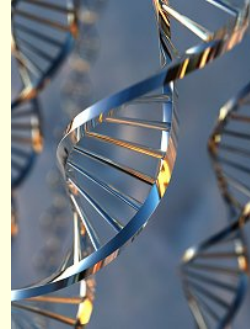
– Charles Darwin

From Darwin to Cognition

- Behavioral Ecology
 - ◆ study of the ecological & evolutionary basis of animal behavior
- Human Behavioral Ecology (HBE)
 - ◆ study of the ecological & evolutionary basis of human behavior
- Evolutionary Psychology (EP)
 - ◆ study of the ecological & evolutionary basis of human cognition (which in turn gives rise to behavior)

Genes, Behavior, and Cognition

- genes → proteins → phenotypic effects
 - morphology (broadly construed)
- also: various bodily systems:
 - circulatory system & respiratory system
 - specialized proteins give rise to specialized tissues and organs
- specialized problems = specialized solutions



Genes, Behavior, and Cognition

- functionally complex phenotypic traits result from forces of natural selection
 - phenotypes increase inclusive fitness
 - thus increasing gene frequency
- this means that for genes to increase in frequency, phenotypic effects must be intimately tied to survival & reproduction
- when we observe functionally complex phenotypes, we look for historical influence on ancestral inclusive fitness

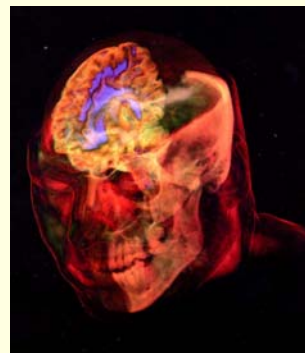
Genes, Behavior, and Cognition

Some phenotypic effects are behavioral:

- a gene can also increase in frequency by making it more likely that the organism performs some fitness-enhancing behavior.
 - courtship displays, parental investment, etc.
- however, behaviors aren't made of proteins:
 - genes work indirectly via (neuro)physiology
- brain, nervous system, perceptual organs...
 - all are made up of proteins or amino acids

Genes, Behavior, and Cognition

- the brain & nervous system produces behaviors by:
 - updating information about the organism's environment,
 - maintaining various "representations" such as desires, goals, beliefs, predictions, plans, etc.,
 - supplying various motivational cues.



Genes, Behavior, and Cognition

- mind/brain/nervous system = information-processing system:
 - analogous to other physiological systems
 - a proximate cause of human behavior
 - evolved over a long period of human history
- mind/brain/nervous system = complex trait...
 - responsive to selection pressures faced by our ancestors
 - we can better understand the function of cognition in light of evolutionary analysis

Evolutionary Psychology (EP)

- basic idea behind evolutionary psychology:
- evolutionary theory applied to mind & cognition
 - cognition = an evolved, functionally complex system
- evolutionary psychology maintains that:
- the structure, function, & organization of cognition is specialized
 - exists and persists because it enhanced inclusive fitness

Evolutionary Psychology (EP)

As a general field of inquiry, evolutionary psychology is committed to several basic methodological assumptions:

- A. study human cognition via evolutionary theory:
- just as physiologists have revealed the functional organization of the human body...
 - the functional organization of cognition can be understood in light of evolution
 - evolution did not stop below the jaw!

“Using the body as a model for the brain, it is a fair guess that the brain, too, is composed of one or more functional parts, each of which is also specialized to facilitate the survival and reproduction of the organism... Thus, according to evolutionary psychology, neural tissue is no different from any other tissue: it is functionally organized to serve survival and reproduction. This is the foundational assumption of evolutionary psychology...

Evolutionary psychologists are betting that cognitive structure, like physiological structure, has been designed by natural selection to serve survival and reproduction.”

– Edward Hagen

Evolutionary Psychology (EP)

B. complex traits (like cognition) exist & persist because they solved important problems regarding survival and reproduction:

- cognitive complexity is the result of dealing with a complex environment (this includes a complex social environment).
- cognitive complexity allows for rapid learning.
- cognitive complexity allows for greater flexibility in behavior responses.
- cognitive complexity is not likely to be a happy accident that persists, unless it reliably contributed to enhanced fitness.

“Boiled down to essentials, a nervous system enables the organism to succeed in the four Fs: **feeding, fleeing, fighting, and reproducing.** The principle chore of nervous systems is to get the body parts where they should be in order that the organism may survive... Improvements in sensorimotor control confer an evolutionary advantage: a fancier style of representing is advantageous so long as it is geared to the organism’s way of life and enhances the organism’s chances of survival. Truth, whatever that is, definitely takes the hindmost.”

– Patricia Churchland

Evolutionary Psychology (EP)

C. the structure and function of cognition will closely reflect ancestral reproductive ecology:

- identify stable features of our ancestral environment as well as the potential problems related to survival and reproduction.
- hypothesize specialized cognitive abilities to solve these particular problems.
- empirically test for discrete specialized cognitive abilities (called “modules”).
- we already accept other specialized perceptual modules: vision, hearing, speech, etc.

“It was the heart and soul of Darwin’s theory that life has a history, mind has a history, and the evolution of species, like the partly haphazard structure of an ancient city, often updates obsolete parts of the body, leaving the residue of archaic, obsolete organs in place. In the concluding chapter of the *Origin*, Darwin introduces a profoundly personal manifesto:

‘When we no longer look at an organic being as a savage looks at a ship, as something wholly beyond his comprehension, when we regard every production of nature as one which has a long history; when we contemplate every complex structure and instinct as the summing up of many contrivances, each useful to the possessor, in the same what as any great mechanical invention is the summing up of the labor, the experience, the reason and even the blunders of numerous workmen; when we thus view each organic being, how far more interesting—I speak from experience—does the study of natural history become!’ ”

– Jeremy Campbell

Evolutionary Psychology (EP)

- There is also a specific research paradigm called “Evolutionary Psychology” (with caps)
 - Cosmides, Tooby, Buss, Pinker, et al.
- build upon general methodology.
- committed to additional (controversial) details about evolutionary study of human mind.
- They also pick highly suggestive & controversial topics:
 - mate selection, murder, rape, differential parental investment, domestic violence, social dominance, cheat detection...

Controversial claims...

Controversial claims of Evolutionary Psychology:

- Cognitive modules are adaptations
 - worry = “adaptationist” thinking and the scientific value of “just-so stories”
- The Environment of Evolutionary Adaptiveness (EEA) = the hunting-gathering lifestyle during the Pleistocene (approx: 1.8 mya – 10,000 ya)
 - worry = narrow conception of the EEA
 - constrains scope of relevant adaptive problems to be considered.

Controversial claims...

Controversial claims (continued):

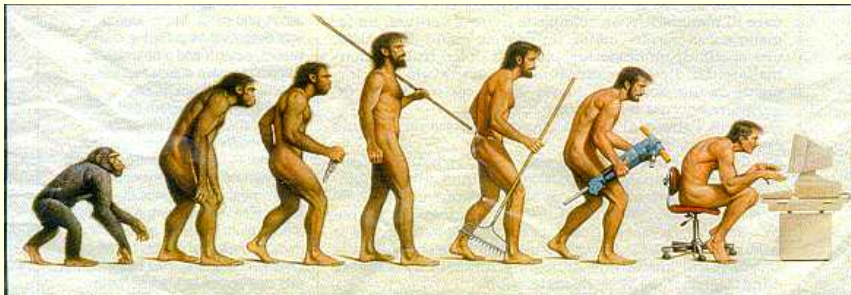
- The human mind is massively modular:
 - the mind is comprised of 100s or 1000s of distinct cognitive modules, which are domain-specific, encapsulated, fast, automatic, and opaque.
 - tends to ignore developmental plasticity.
- These modules are universal & constitute a single human nature:
 - observed cultural differences are superficial,
 - universal psychological nature...

Stone Age Minds?

Because all human minds are composed of these species-typical, genetically-specified modules, our so-called modern minds are roughly the same as our Pleistocene ancestors...

“Our modern skulls house Stone Age minds”

– Cosmides & Tooby



Self-Deception: General Characteristics

A self-deceiver is someone who:

- ≈ willingly or knowingly embraces a falsehood.
- ≈ holds a belief contrary to available evidence.
- ≈ actively misrepresents reality to their conscious mind.
- ≈ is lying to him- or herself.

Self-Deception

- Willful neglect of evidence.
- Creative attempts to shield oneself from the available evidence.
- Skewed estimation of evidence (devaluation of the significance of evidence).
- Flat-out denial of harmful or disturbing information.
- Maintain a comfortable or self-serving belief.
 - akin to wishful thinking?
- Beneficial to the self-deceiver or to something or someone valued by self-deceiver.

Self-Deception

- Self-deceivers are morally blameworthy
- Exhibit a kind of “failure”
 - akin to hypocrisy?
- A kind of self-serving “rationalization”
 - developing a “convenient” story
- Attempt to escape responsibility or to place blame on others.

Self-Deception

Main Ideas:

Self-deception possesses a...

- ✓ NEGATIVE connotation as an
- ✓ UNHEALTHY cognitive practice that is
- ✓ MORALLY BLAMEWORTHY because it is a
- ✓ DECEPTIVE BIAS toward
- ✓ SELF-SERVING beliefs that help to
- ✓ ESCAPE RESPONSIBILITY...and in others it
- ✓ SHOULD BE AVOIDED/CORRECTED...

Self-Deception

- Mostly NEGATIVE and OTHER-DIRECTED
 - because we are rarely aware of our own successful self-deception!
- Why so interesting?
 - My own self-deception is executed beautifully!
- Evolutionary theory makes self-deception:
 - A marvelous, creative cognitive ability
 - A riddle to be solved... Can evolution help?

Philosophical Approaches

Special case of deception of others:

Agent A deceives agent B about belief p...

- ✓ A intentionally causes B to believe p is true...
- ✓ A actually believes that p is false...
- ✓ It turns out that p is false.

self-deception = A and B are the same person

Two Philosophical Puzzles

1. How can a single person hold contradictory beliefs?
2. How can a single person hold contradictory motivations/intentions?

OR:

How can a person be unaware of his/her motivations/intentions?

Solution: Conscious / Unconscious

- Experimental literature builds upon Freud's basic insights.
- Includes unconscious coping mechanisms:
 - Denial
 - Projection
 - Repression
 - Confabulation
 - Avoidance

Experimental Evidence

Three experimental examples:

- ❶ Blindsight
- ❷ Voice Recognition & GSR
- ❸ Face Recognition & GSR

Experimental Evidence

- ❶ Blindsight
 - Visual impairment due to brain trauma
 - Whole or partial (hemi-neglect)
 - half-plate of food
 - Not conscious of any visual input
 - Results:
 - “guessing” far exceeded chance
 - duck/flinch at approaching objects
 - rationalized explanation of behavior

Experimental Evidence

- ② Voice Recognition & GSR
 - Galvanic Skin Response
 - Spike when hear familiar voice
 - Including one's own voice
 - Verbal tasks recorded & played back
 - Results:
 - responses were less reliable than GSR
 - denied own voice when unsuccessful
 - claimed the voice when successful

Experimental Evidence

- ③ Face Recognition & GSR
 - Spike when see familiar face (incl. self)
 - Prosopagnosia: lost ability to recognize faces (familiar, relatives, own self!)
 - Results:
 - no conscious recognition reported
 - GSR showed spike for familiar face
 - “the skin new better”

Outcomes: Conscious / Unconscious

- consciousness is the tip of the proverbial cognitive iceberg.
- our mental lives...
 - are not perfectly unified,
 - are not introspectively transparent.
- helps to solve both philosophical puzzles.
- the conscious mind is not the only active force.
- distinct pattern of unconscious influence:
 - beneficial/charitable to self
 - downplay failures

How Common is Self-Deception?

- Citizens:
 - 70%-80% report being above-average drivers.
- Undergrads:
 - 80% think that they'll be in top half of the class.
- High school seniors:
 - All students thought that they were above average in social abilities,
 - 25% reported that they were in the top 1%.

How Common is Self-Deception?

➤ University Professors:

- 94% reported that they were better at their jobs than their average colleague.

We must be living in Lake Wobegon!

“where the women are strong, the men are good-looking, and all the children are above average”

➤ Psychologists studying mental health:

- Mental health requires some “positive illusions”
- depressed / mildly depressed people show less biasing = beliefs are more accurate (result: less out-going).

The Self-Deception Riddle...

➤ Self-deception as a kind of cognitive biasing:

- happening at the unconscious level,
- selective about evidence,
- beneficial / comforting to self.

➤ Why would evolution favor self-deception?

- From an evolutionary point of view, why would self-deception exist and persist?

➤ Selection to build/maintain complex cognitive trait:

- working on individuals (and their genes),
- favoring high inclusive fitness.

Evolution & Self-Deception

1. Social Benefits:

- 1.1 Deception of others more successful
- 1.2 Maintain good reputation/public image
- 1.3 Reciprocal exchanges

2. Personal Benefits:

- 2.1 Psychological Benefits
- 2.2 Physiological Benefits

1. Social Benefits:

1.1 Deception of others more successful:

- for social critters, deception of others could be aided by self-deception (Trivers).
- avoid tell-tale signs of deception (which our conspecifics have evolved to detect).
- analogous to camouflage or hiding fear (DeWaal's chimpanzee covering face).
- conscious mind is a "social front" (for self too).
- convincing denials of deception (fictitious narratives of intention).
- deception goes unnoticed by others...

1. Social Benefits:

1.2 Maintain good “reputation” or “public image”

- deceivers (cheaters) are punished/harmed.
- escape detection = avoid conflict, enjoy benefits, access to mates & resources.
- maintenance of reputation requires:
 - biased memory & +estimation of one’s contribution.
 - self-promotion via inflated appraisals of self & abilities (especially in cases of success).
 - sensitivity to peer observation (game experiment)
- appear to be fair, cooperative, trustworthy...

1. Social Benefits:

1.3 Reciprocal exchanges:

- good reputation = not a cheater, not a free-rider, equal effort, altruistic, trustworthy, etc.
- good reputation → more opportunities for reciprocal exchanges (lots of benefits).
- participate as group member:
 - shared stories
 - group solidarity & emotional trust
 - socially acceptable account of motivation
- conflicting internal motivations disguised...

2. Personal Benefits:

2.1 Psychological Benefits:

- Positive Illusions... comforting feelings of being:
 - part of a group (as a fully-cooperating member),
 - above-average (in various aspects),
 - in control, confident, empowered (future-oriented).
- Simplified, coherent model of self, others, & world:
 - maintenance of expectations... via...
 - stereotypes and categorization,
 - denial, avoidance, devaluation of evidence, etc.

Hemispheric Specialization

- Anosognosia: stroke patients & paralysis
 - Left-hemisphere strokes with right-side paralysis = rarely denied
 - Right-hemisphere strokes with left-side paralysis = usually/frequently denied
- Denying Paralysis: Can you move your arm?
 - Yes! Of course! I'm pointing at you right now!
 - Oh, I'm tired and have arthritis in the shoulder.
 - That's not my arm! It's my brother's arm!

Hemispheric Specialization

Anosognosia & Denying Paralysis (cont)

- Option to perform two-handed tasks:
 - Tie these shoes.
 - Lift this tray.

- Outcomes:
 - Invented reasons for failure other than being paralyzed.
 - Denied their failure later!
 - Reported that they had been successful!

Hemispheric Specialization

- Left hemi = model of how things are
 - business as usual; anomalies ignored
 - keep coherent view of self and world
- Right hemi = detects / collects anomalies
 - forces “Gestalt switch” when overwhelming

- For patients with left-side paralysis...
 - Right hemi is impaired
 - can no longer force revisions to model
 - patients confabulate/deny... to protect model

2. Personal Benefits:

2.2 Physiological Benefits:

- lowered stress,
- reduced hypertension & heart disease,
- increased sperm count,
- less erectile dysfunction,
- hospitable pH for fertilization & implantation...

Some Conclusions (1)

Like the Logos & Divine Creation:

- Evolutionary theory provides an account of the connection between mind and world.
- Helps us to see how we come to understand the world and ourselves.
- Also equips us to study the mind in more detail:
 - investigate the mind via same spirit that animates natural sciences.

Some Conclusions (2)

Unlike the Logos & Divine Creation:

- Evolutionary theory does not establish this connection in terms of strict truthfulness, rationality, or certainty.
- The guiding principle of evolution is grounded in survival, reproduction, inclusive fitness.
 - Cognition is the outcome of pragmatic evolutionary trade-offs (what worked).
 - Built over time, assembled from the left-overs in Mother Nature's cupboards.

Some Conclusions (3)

- Makes the philosopher's assumption problematic
 - i.e., that cognition is for generating true beliefs.
- Evolutionary contexts = truth is not the exclusive aim.
 - both true and false beliefs contribute to fitness.
 - real costs for purely true belief generation.
- Useful falsehoods (such as those connected to self-deception) are tolerated & quite successful in terms of inclusive fitness.

Some Conclusions (4)

- A fuller understanding of self-deception requires biological and especially evolutionary considerations.
- We might just discover: how the mind works is different than our assumptions would have us believe.
- From an evolutionary point of view,
 - a little self-deception goes a long way,
 - after all, it got us this far!