

Evolution, Economics, and the Brain

Dr. Michael Shermer & Dr. Paul J. Zak

Transdisciplinary Course (T-Course) TNDY 402M

Monday Evenings 4-6:50 pm, January 23–April 30, 2012 (15 weeks counting spring break)

Classroom: Burkle 24. Office Hours: Mondays before or after class or by appointment.

Contact:

TA:

Readings:

Buss, David. 2007. *Evolutionary Psychology: The New Science of the Mind*. 3rd edition. New York: Allyn and Bacon.

Dawkins, Richard. 2009. *The Greatest Show on Earth: The Evidence for Evolution*. New York: Free Press.

Harris, Sam. 2010. *The Moral Landscape: How Science Can Determine Human Values*. New York: Free Press.

Pinker, Steven. 2011. *The Better Angels of Our Nature: Why Violence Has Declined*. New York: Viking.

Shermer, Michael. 2008. *The Mind of the Market*. New York: Times Books.

Shermer, Michael. 2011. *The Believing Brain*. New York: Times Books.

Zak, Paul J. Forthcoming 2012. *The Moral Molecule*. Selected chapter readings.

Assignments and Grade:

Grade: Students may choose between a letter grade or satisfactory/unsatisfactory.

For satisfactory, students must participate in class discussions and give a lecture

For a letter grade students must complete all assignments

Assignments:

—Classroom participation in lecture discussions and review of readings

—An 18-minute TED talk on topic of student's choice related to course subject *or...*

—2 x 2 debate (4 students) on topic of students' choice approved by professor

—A 700-word Opinion Editorial that applies a course subject to a current event *or...*

—1200-word book review of nonfiction work related to course topics

—Midterm Exam (take home) on readings for the first half of the course

—Final Exam (take home) on readings for the second half of the course

—Interdisciplinary Team Research Project and Experiment.

Course Schedule

Jan. 23—Week 1. The Believing Brain

Patternicity: The tendency to find meaningful patterns in random noise

Agentivity: The tendency to impose agency and intention into found patterns

The believing neuron: how beliefs are formed out of neural networks and patterns

Cognitive biases and beliefs

How science resolves belief conflicts

Pseudoscience, Bad science, Nonscience, and why smart people believe weird things

READING: *Shermer, The Believing Brain*, entire book

Jan. 30—Week 2. How the Brain Works (Shermer gone/Zak Lecture)

The Central Nervous System

The brain's basic components

How neurons communicate

Synaptic plasticity and learning

Interactions between groups of neurons

READING: Zak Chapters distributed by email

Feb. 6—Week 3. *Evolution, Creationism and Intelligent Design*

What Evolution Is

Why People Do Not Accept Evolution

In Search of the Designer

The Controversy Over Creationism

Evolution on Trial: Scopes, Arkansas, Louisiana, Dover, the U.S. Supreme Court

The Case for Evolution and Against Intelligent Design

READING: Dawkins, *The Greatest Show on Earth*, entire book

Feb. 13—Week 4. *Evolutionary Psychology, Part 1*

From animal behavior to human behavior

From sociobiology to evolutionary psychology

The modularity of the mind

Language and cognition

Love and attraction

Mating and marriage

Jealousy and spousal violence

Status-seeking and aggression

Warfare and between-group violence

READING: Buss, *Evolutionary Psychology*, 1st half

Feb. 20—Week 5. *Evolutionary Psychology, Part 2*

From animal behavior to human behavior

From sociobiology to evolutionary psychology

The modularity of the mind

Language and cognition

Love and attraction

Mating and marriage

Jealousy and spousal violence

Status-seeking and aggression

Warfare and between-group violence

READING: Buss, *Evolutionary Psychology*, 2nd half

Feb. 27—Week 6. *Evolutionary Economics*

The Great Leap Forward

Our Folk Economics

Bottom-Up Capitalism

Of Pandas, Products, and People

Minding Our Money

The Precarious Career of *Homo economicus*

READING: Shermer, Mind of the Market, 1st half

March 5—Week 7. Behavioral Economics and Neuroeconomics

The Value of Virtue
Why Money Can't Buy Happiness
Trust with Credit Verification
The Better Angels of Our Nature
Don't Be Evil

READING: Shermer, Mind of the Market, 2nd half

March 12—Week 8. SPRING BREAK!

March 19—Week 9. The Better Angels of Our Nature, Part 1

The pacification process
The civilizing process
The humanitarian revolution
The long peace

READING: Pinker, The Better Angels of Our Nature, Chapters 1-5

March 26—Week 10. The Better Angels of Our Nature, Part 2

The new peace
The rights revolutions
Inner demons
Better angels
On angels wings

READING: Pinker, The Better Angels of Our Nature, Chapters 6-10

April 2—Week 11. Economics and the Origin of Wealth

How the world really works
Why economies rise and fall
The 12 requirements of economic freedom
How economists view the world
How to think like an economist

READING: Zak, selected readings and papers to be emailed

April 9—Week 12. Evolutionary Ethics & The Science of Good and Evil

Transcendent Morality: How Evolution Ennobles Ethics
Why We Are Moral: The Evolutionary Origins of Morality
Why We Are Immoral: War, Violence, and the Ignoble Savage Within
Master of My Fate: Making Moral Choices in a Determined Universe
How We Are Moral: Absolute, Relative, and Provisional Ethics
How We Are Immoral: Right and Wrong and How to Tell the Difference

READING: Harris, The Moral Landscape, 1st half

April 16—Week 13. Science, Religion, and Human Values

The Naturalistic Fallacy and Is/Ought Problem
Can science inform or determine human values?
Can religion inform or determine human values?

Science and Religion: Separate Worlds, Same Worlds, or Conflicting Worlds?

The new atheism and the rise of fundamentalisms

READING: Harris, *The Moral Landscape*, 2nd half

April 23—Week 14. Civilization 2.0

From Civilization 0 to Civilization 1.0

From bands and tribes to chiefdoms and states

Empires, Nations, and Globalization

From Civilization 1.0 to Civilization 2.0

From *Terra Firma* to *Ad Astra*

READING: None. [Oral Presentations of Research Papers]

April 30—Week 15. What it All Means

[Dinner Party followed by Final Oral Presentations of Research Papers]

The Structure of the Transdisciplinary Course

Evolution, Economics, and the Brain is a doctoral-level T-Course designed to address large issues in which students employ knowledge and research protocols from many different disciplines to shed new light on specific problems. One of the books we will be reading—Steven Pinker’s *The Better Angels of Our Nature*—integrates evolution, history, anthropology, sociology, psychology, economics, and political science to explain a single phenomenon: the decline of violence. It is a model work in transdisciplinary integration.

This is an unparalleled opportunity to learn how to do research that advances knowledge that can make a difference in society. History has demonstrated time and again that most of the major world-changing innovations have come through transdisciplinary thinking and transdisciplinary collaboration. Thus it is that CGU has coined the term *transdisciplinary* to describe the cognitive style and scientific research that crosses disciplines to propel intellectual advances within a particular discipline that can lead to more effective and creative solutions to real-world problems.

Within disciplines, one sees exciting theoretical contributions made by those willing to trespass and return. Charles Darwin, for example, was a transdisciplinary thinker. He matriculated at Edinburgh University as a medical student, following in the footsteps of his illustrious father (Robert) and grandfather (Erasmus), both prominent physicians, but in this age of pre-anaesthesia medicine Darwin could not stomach surgery and so changed fields to theology and there discovered natural theology—the study of the works of God (nature) in order to better understand the words of God (the Bible). This led him to the study of geology, paleontology, zoology, botany, and the methods of the natural sciences. It took a transdisciplinary cognitive style of this type to solve the problem of explaining the diversity and natural history of life, and Darwin did it because he was willing to cross the traditional boundaries of his time. He was, for example, the first historical scientist, correctly deducing that the various types of coral reefs described in Charles Lyell’s *Principles of Geology*, which he read on the *Beagle* before getting to the South Pacific, did not each have different types of causal explanations, but were in fact all examples of a chronological sequence in the evolution of coral reefs due to geological forces.

The entire theory of evolution—and its application to other fields such as psychology, economics, and neuroscience—requires transdisciplinary thinking, which is why so many people still grapple with understanding and accepting its full implications. And here we are not just thinking of Conservative Creationists, who harbor fears that evolutionary science conflicts with revealed religion, but with Liberal Creationists as well, who are willing to apply evolutionary thinking only to the human body but not the human mind, human culture, and human social institutions. Darwin’s dangerous idea has yet to be fully embraced on both sides of the political spectrum. For this to be achieved we need transdisciplinary thinking.

At Claremont Graduate University we emphasize working across the disciplines. This course, along with the other T-Courses, are part of an on-going experiment at CGU of changing the world through crossing both intellectual and physical boundaries.

Course Summary:

A transdisciplinary and integrative overview of evolutionary theory, evolutionary economics, and neuroscience (“Evolution, Economics, and the Brain”) that includes a brief history and science of evolutionary theory, along with the evolution-creationism controversy and how it evolved in the context of American history and culture. As well, the application of evolutionary theory will be considered in its integration into psychology, anthropology, ethics, and economics. The course also includes an introduction to behavioral neuroscience and will focus on teaching students how new findings in the brain sciences can inform their work in the social sciences and humanities. For example: How reward acquisition is affected by risk; Why humans are typically risk-averse and when they are not; Hyperbolic discounting of future rewards; How interpersonal trust is built and maintained; How “rational” vs. “irrational” decisions are made; The basis for cooperation and aggression; The reason people punish others; The role of hormones in decisions; The basis for social norms or ethics; The sense of justice; The basis for love and hate and how these effect decisions; War and peace; Human nature; The decline of violence; The humanitarian and rights movements; and more.

Belief systems are powerful, pervasive, and enduring. This course synthesizes thirty years of research to answer the question of how and why we believe what we do in all aspects of our lives. In this course we are not just interested in understanding why people believe weird things, or why people believe this or that claim, but why people believe anything at all. The thesis of the course is straightforward:

We form our beliefs for a variety of subjective, personal, emotional, and psychological reasons in the context of environments created by family, friends, colleagues, culture, and society at large; after forming our beliefs we then defend, justify, and rationalize them with a host of intellectual reasons, cogent arguments, and rational explanations. Beliefs come first, explanations for beliefs follow. I call this process belief-dependent realism, where our perceptions about reality are dependent on the beliefs that we hold about it. Reality exists independent of human minds, but our understanding of it depends upon the beliefs we hold at any given time.

The brain is a belief engine. From sensory data flowing in through the senses the brain naturally begins to look for and find patterns, and then infuses those patterns with meaning. We can't help it. Our brains evolved to connect the dots of our world into meaningful patterns that explain why things happen. These meaningful patterns become beliefs, and these beliefs shape our understanding of reality. Once beliefs are formed the brain begins to look for and find confirming evidence in support of those beliefs, which adds an emotional boost of further confidence in the beliefs and thereby accelerates the process of reinforcing them, and round and round the process goes in a positive feedback loop of belief confirmation.

This course will address these deep theoretical and psychological issues in the context of specific topics.

Laptop Policy:

You can bring your laptop to class to take notes from the lectures and, if appropriate, look something up online, but you may not check email, Facebook, twitter, etc. during class. The T.A. will be sitting in the back and can see your screens. So don't do email!

Plagiarism Policy:

Don't do it! Don't even think about doing it!! Be very careful about copying and pasting into your notes anything from any source on the Internet as you may forget later to rewrite it or reference it. I am a professional writer and editor and I can tell when the writer's style changes even subtly, and of course thanks to Google it is as easy for me to find copied passages through a search as it is for students to copy and paste passages. The consequences are severe: class failure. Although you may and should use the Internet for your research, all work you turn in must be your own. When citing someone else's idea, use proper documentation. If you are

unsure about what constitutes plagiarism ask me first, and note the Chapman University Academic Integrity Policy: “Chapman University is a community of scholars which emphasizes the mutual responsibility of all members to seek knowledge honestly and in good faith. Students are responsible for doing their own work, and academic dishonesty of any kind will not be tolerated anywhere in the university.” Just don’t do it.

Controversy Disclaimer:

This course deals with many controversial topics related to people’s deepest held beliefs about god and religion, science and technology, politics and economics, morality and ethics, and social attitudes and cultural assumptions. I hope to challenge you to think about your beliefs in all these areas, and others. My goal is to teach you *how* to think about your beliefs, not *what* to think about them. I have my own set of beliefs that I have developed over the decades, which I do not attempt to hide or suppress; indeed, as a public intellectual I am regularly called upon to present and defend my beliefs in lectures, debates, interviews, articles, reviews, and opinion editorials. But in the classroom my goal is not to convince you of anything other than to think about your beliefs. I am often asked “why should we believe you?” My answer: “You shouldn’t.” Be skeptical, even of skeptics.

The Transdisciplinary Research Project

In addition to the midterm and final exams that will integrate the readings in take-home essay questions, and learning to speak and write for the general public (through the TED talk assignment or debate and the Opinion Editorial or book review), your grade will involve a research project that will involve three or more students on a research team—preferably from different disciplines—to design and implement an experiment or survey or demonstration of some type that can shed new light on some aspect of the topic of this course.

To do this, you will use a specially developed tool called “the Claremont Conversation Online.” You will create your research design using a “wiki,” a device that facilitates collaborative work and enables your classmates, the faculty, and anyone else you desire to watch your proposal as it grows, comment on it, and learn from you and with you. You will also be able to go online and watch your classmates’ research proposals develop, contributing your ideas to them. The process has been likened to an atelier at an architecture school. There, students in the same studio watch each other and help each other design their buildings. When professors enter the atelier and make comments on a building, not only the student designing the building can hear and benefit, so can the others in the atelier. The “Claremont Conversation Online” enables a kind of virtual atelier, where what you’re designing is a research proposal.

In the course, in addition to the materials about our substantive topics, you will also be getting materials and inputs about research design. You’ll see templates that are used by funding agencies such as the National Science Foundation and the National Endowment for the Humanities. You’ll be exposed to templates and guides used for doctoral dissertations. As a result, your collaborative research assignment for this course will also give you practice in thinking through research proposals—practice that will be useful to you in designing your dissertation and eventually in obtaining external research support.

During the first several weeks of the course you are encouraged to find potential research partners in the class—at least three of you, from different disciplines. By the end of the third week, together you will submit a one-page description of a possible topic for your principal assignment, the design of a research proposal. In one page, you should give an overview of the topic and your first ideas about how your proposed research might proceed. You will get feedback online and in person from your classmates and professor.

When your topic is approved, you will begin developing your research proposal using “the Claremont Conversation Online.” As noted, you will be helping each other develop the research design, including relevant theory, existing data, the collection of new data (if appropriate), methods for analysis, and so forth. Along the way, you’ll get comments and suggestions from classmates, professors, and others whom you invite to partake in the conversation.