

another argument: Beginning with religious reforms in the first century AD, Jews placed a strong emphasis on literacy and education that later gave them a big advantage in the skilled urban occupations that burgeoned first in the Middle East and then around the world.

After the Romans destroyed the Second Temple in Jerusalem in AD 70, the balance of power within Judaism shifted from the Sadducees to the Pharisees, a sect that rejected the old emphasis on sacrifices and other priest-led rituals. Instead, the Pharisees made it a prime requirement of the faith that every Jewish male read the Torah and teach it to his sons in the synagogue. In the main centers of Jewish life—Eretz Israel, Mesopotamia, and Egypt—virtually all Jews were still farmers and herders at the beginning of the 5th century AD, but literacy levels were high. Then Jews began a movement into the towns, where they worked as shopkeepers and artisans in industries such as tanning, silk, and glassware.

The Muslim Empire started to grow

Beginning with religious reforms in the first century AD, Jews placed a strong emphasis on literacy and education that gave them a big advantage.

in the seventh century AD, and by the ninth century, lands under Muslim rule experienced a burst of urbanization that increased demand for skilled workers in professions such as moneylending, bookselling, shipbuilding, and long-distance trade. This accelerated the movement of literate rural Jews into Baghdad (which had been established only in AD 762), Basra, and other rising cities.

The argument that Jews were legally forbidden or otherwise prevented from owning land is contradicted by a great deal of evidence, the authors say. Documents from the era, including contracts, wills, court records, and especially the rabbinic Responsa—scholarly letters written in response to questions

submitted from the Jewish community—show that Jews could and did own land. Like Christians and other non-Muslim minorities, they faced but one occupational or economic restriction: a tax on land. The largely illiterate Christians stayed on the farm; the Jews, increasingly, chose the towns and cities. Farming may have been a minority occupation among Jews as early as the ninth century.

By then, Jews seeking economic opportunity were beginning to migrate to North Africa and southern Europe. Their ability to communicate by letter and to understand contracts and trade laws gave them a natural advantage as merchants and moneylenders, and allowed a number to live as well as some local aristocrats. As trade revived in medieval Europe and throughout the Mediterranean, Jews' literacy and far-flung social networks proved an enormous advantage, and enterprising Jews established enclaves as far away as China. A religious transformation was remaking a people and the world they inhabited.

SCIENCE & TECHNOLOGY

Why Your Mind Has A Mind of Its Own

THE SOURCE: "The Vulcanization of the Human Brain: A Neural Perspective on Interactions Between Cognition and Emotion" by Jonathan D. Cohen, in *The Journal of Economic Perspectives*, Fall 2005.

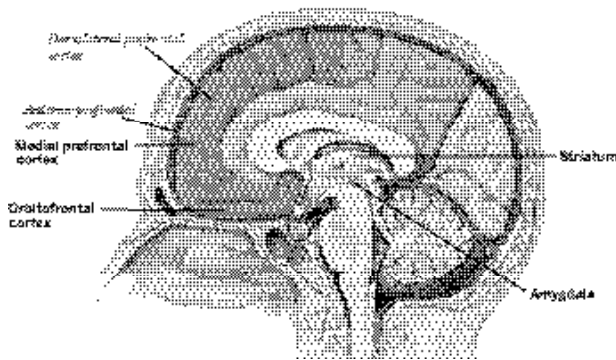
HOW DO WE MAKE DECISIONS? Why do we allow our emotions to get in the way of rational response? What

we think of as emotional behavior may be the result of "evolutionarily old" mechanisms winning out over areas of the brain that developed later in the course of human evolution, argues psychologist Jonathan D. Cohen, director of the Center for the Study of the Brain, Mind, and Behavior at

Princeton University. While emotional behavior sometimes seems irrational in a modern setting, it may have been perfectly reasonable in the early days of our evolutionary history.

In this view, the human mind is best thought of not as a unified whole but rather as a "society of minds," each capable of independent action. So although the brain's prefrontal cortex enables the individual to act in accordance with abstract goals or principles, it doesn't always run the show. The older, "limbic" system of the brain acts more quickly and thus may win the battle to determine behavior.

A Society of Minds



Immediate moral quandaries trigger activity in the emotional processing regions of the brain (in bold). Under other conditions, regions of more-rational thought processes (in italics) come alive.

This theory resolves long-standing conundrums in various fields, such as the inconsistencies of individual moral behavior illustrated by the switch and footbridge scenarios.

In the switch scenario, individuals are asked if they would flip a switch to divert a trolley car onto a sidetrack if it would kill one person but save five others who are on the main track. Most people say yes.

In the footbridge scenario, they are asked if they would push a man off a footbridge onto the track below to save the same five people; in this instance, most people say no. We instinctively recoil from the idea of pushing someone off a bridge, but if we can flip a switch from a distance, we seem able to make the rational choice.

What explains the difference? In his work using magnetic resonance imaging (MRI) to monitor brain activity, Cohen sees an answer in the “society of minds” theory.

In people faced with dilemmas like the footbridge scenario, MRIs revealed activity in the emotional processing regions of the brain, such as the medial prefrontal cortex. The switch scenario, however, triggered activity in the ante-

rior and dorsolateral areas of the prefrontal cortex, home of more-rational thought processes.

Cohen is careful to note that MRIs, which measure changes in blood oxygen in specific areas of the brain, are not a decisive indicator of brain activity. And even a correlation between brain activity and behavior does not prove that one *caused* the other.

Why would people have developed a negative emotional response to pushing someone off a bridge? One possibility is that an aversion to killing arose because it fostered the creation of cooperative social structures that conferred an evolutionary advantage.

Many seemingly irrational human decisions observed by behavioral economists can also be explained by the dominance of evolutionarily old emotional responses. In the ultimatum game, for example, a player is given a sum of money and instructed to make an offer to a partner about how it should be split between them. If they can't agree on a split, both players get nothing. Surprisingly, people in tests run in many different cultures generally reject offers of less than 20 percent of the sum, often walking away empty handed.

This, too, seems to be a deeply embedded response—Cohen suggests that early humans living in small groups needed to show their fellows that they couldn't be taken advantage of—and it's associated with activity in more primitive areas of the brain. The contemporary human preference for immediate consumption (think failure to save) also falls into this category; the best place for our evolutionary ancestors to store food was in their bellies.

It's the rational mind that has created today's complex technological societies, Cohen observes, but the often discordant “society of minds” in our heads isn't always up to the challenges those modern societies pose.

SCIENCE & TECHNOLOGY

Drinking Lessons

THE SOURCE: “Shape of Glass and Amount of Alcohol Poured: Comparative Study of Effect of Practice and Concentration” by Brian Wansink and Koert van Ittersum, in *BMJ*, Dec. 2005.

FROM THE FRONTIERS OF SCIENCE comes important insight into how to pour yourself a drink. Or, more to the point, what kind of glass to use.

Brian Wansink and Koert van Ittersum, marketing professors at Cornell University and the Georgia Institute of Technology, respectively, armed a group of 198 college students and 86 bartenders with bottles of ersatz rum, whiskey, and vodka, and asked them to pour a shot (1.5 ounces) to make a mixed drink. But some participants were given short, wide tumblers while others were given tall, slender highball glasses. The result: Virtually all those given tumblers