

brains!

Best of the Brain

The five biggest neuroscience developments of the year.

By William Saletan

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The human brain has spent its evolutionary history learning about everything else in the world. Since last summer, it has learned quite a bit about itself. It has discovered lots of things about [female sexuality](#), [incest](#), [psychopaths](#), [IQ](#), [brain death](#), [addiction](#), [compulsive buying](#), and how to [remotely control animals through cranial implants](#). But five major trends and breakthroughs stand out. Here they are, with links to related news items and columns.

1. The arrival of mind reading. Scientists in Germany used pattern recognition software to predict, from functional magnetic resonance imaging of people's brains, whether each person had secretly decided to add or subtract two numbers he was looking at. The computer correctly predicted the decision [71 percent of the time](#). The advertised application of this technology is computers that can discern and execute your will when you want them to—for example, if you're paralyzed or don't want to use a mouse. The feared application is [mental surveillance](#).

2. The neural alteration of morality. Six people with damage to the ventromedial prefrontal cortex were presented with moral dilemmas (e.g., would you smother a baby to prevent bad guys from finding and killing people in hiding) and were found to be [two to three times more willing to kill](#) than people without brain damage. The advertised conclusion is that such willingness to kill is [objectively immoral](#). The feared conclusion is that if brain design determines what's moral, you can [change morality by changing the brain](#)—and once technology manipulates ethics, ethics can no longer judge technology.

3. The medicalization of sexual orientation. U.S. experiments confirmed that [7 percent to 10 percent of rams are gay](#). Research suggests brain biology is involved. The advertised application is identification of gay or asexual rams, "thus [eliminating their use for general breeding](#) purposes." The feared application is identification of gay male fetuses, leading parents to [abort them or alter their orientation](#) through hormone treatment in the womb. Some conservative Christian leaders have already [endorsed](#) this idea.

4. The discovery of vegetative consciousness. For five months after her car crash, an English patient displayed "no reproducible evidence of purposeful behavior" and was declared vegetative. Then she was asked, during an fMRI scan, to imagine playing tennis and walking through her home. The scan [lit up](#) with patterns that in healthy brains signify language, movement, and navigation. A follow-up report cited anecdotal cases in which [Ambien woke brain-damaged people](#) from prolonged unresponsiveness. The happy implication is that some people we thought were finished may be salvageable. The horrifying corollary is that until we find these people, they're [buried alive in their skulls](#).

5. The progress of artificial intelligence. Computers [completed their rout of humans at chess](#), as a \$137 computer program beat the world chess champ in a six-game match, giving computers a 2-0-2 record (two wins, two ties) against human champs in their last four matches. Computers also improved their ability to [adapt and modify themselves](#), as a robot demonstrated that it could recognize an injury to itself, infer how its limbs worked, and adjust its method of locomotion. However, DARPA [scrapped a program to reverse-engineer the brain](#), leaving scientists to wonder whether the project had lost out to other priorities or had simply failed.

Slate science editor **Daniel Engber** will be online at [washingtonpost.com](http://www.washingtonpost.com) **Thursday, April 26, at 2 p.m. ET** to chat with readers about this week's special issue on the brain. [Submit your questions and comments](#) before or during the discussion.

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