mathematical ability. That may not sound very useful. But in doing so, the UCL researchers have pinpointed the part of the brain they believe is responsible for humans' intuitive sense of magnitude—or what makes a number big.

Cohen Kadosh took five volunteers with normal math abilities through more than 500 trials. In an experiment published this month in *Current Biology*, he targeted different regions of the test subjects' brains with magnetic pulses while they performed number-recognition problems. A normal subject, when asked to identify whether a 2 or a 4 is written in larger text, will be a split-second faster on those occasions that the 4 is printed bigger. Normal subjects process that 4 is a bigger quantity than 2, and that information aids their pick—just as number recognition slows them down slightly when a larger 2 sits next to a smaller 4. But when Cohen Kadosh stimulated a specific part of each subject's right parietal lobe, they performed exactly the same as a group of dyscalculics, whose ability to select which numeral was printed the largest was unaffected by the numbers' underlying values. No other region of the brain responded the same way.

This means that scientists can, in effect, switch off a person's grasp of numbers. It's fascinating, both because it reduces a serious learning disability to the mere flick of a neural switch and because, by doing so, it holds out a tantalizing possibility that one day a cure may be as simple as flicking that switch in reverse. Cohen Kadosh hopes the result will allow scientists to develop a diagnostic tool for dyscalculia based on neuroimaging. Identifying children with developmental dyscalculia would let parents intervene earlier to teach important math concepts, just as they can intervene today to help dyslexic children read better.

Until then, the most significant outcome might be to remind teachers and parents—even those math-minded scientists—that dyscalculia is a neurological condition, quite separate from not paying attention in class or just being a bit slow. "Dyscalculia is where dyslexia was 30, 40 or 50 years ago," says Mahesh Sharma, a professor of mathematics education at Cambridge College in Massachusetts. Indeed, even the definition is a bit fuzzy. Some researchers count disabilities in spatial perception or arithmetic operations as dyscalculia, while others restrict it to difficulty recognizing numbers normally. Cohen Kadosh's tests hold out the possibility that different math dysfunctions could well be processed elsewhere in the brain. "I won't say this study provides all the answers," says Sharma. Definitely not, but at least it helps show why, for some, two plus two equals trouble. ■

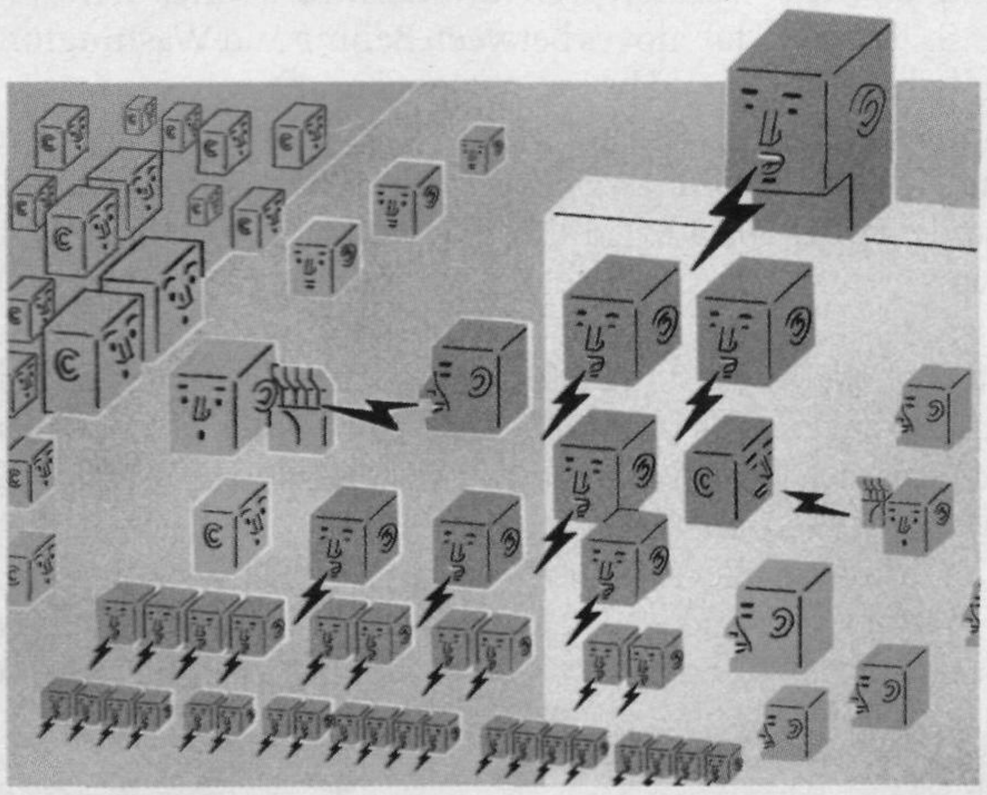
BUSINESS

Word on the Street. *Psst*... your friends may be shilling for a soap company. Why people love marketing by word of mouth

BY BARBARA KIVIAT

THE NEXT TIME SOMEONE YOU KNOW RAVES about a dish detergent or motor oil, consider this: you might be on the receiving end of a marketing campaign. It's a new world for people whose job it is to sell you things, what with consumers' digital video recorder–enabled ability to skip over ads they don't want to see, and their Internet-empowered freedom to find out all the stuff left out of a 30-sec. TV spot. That's driving marketers to all sorts of new places, including your circle of friends.

Procter & Gamble, a pioneer in the field, has been focusing on word of mouth for six years through its Tremor division, which has enlisted 225,000 teenagers in the U.S. to tell their friends about brands like Herbal Essences and Old Spice. Last year, P&G signed up 500,000 adult volunteers, all mothers, for Vocalpoint, a program in which the moms



evangelize about pet food, paper towels and hair color. P&G gives the women marketing materials and coupons, but they are free to say whatever they like (or nothing at all) about the products. BzzAgent, a firm that specializes in word-of-mouth marketing, has its 260,000 volunteers submit detailed profiles about their habits and interests, which BzzAgent uses to match them to word-of-mouth campaigns for products made by companies such as Nestlé, Arby's, Philips, Kraft and BP.

This unscripted strategy might sound like a big risk, but despite the conventional wisdom that consumers are much more likely to voice complaints than praise, recent research finds the opposite. In one study, Andrea Wojnicki, an assistant professor at the University of Toronto, looked at self-styled experts and found that they were likely to keep negative experiences to themselves, lest their skill—at, say, picking a restaurant—be called into question.

And why are these citizen marketers so willing to shill for free? Inside access to products and the feeling that companies care about what you and your friends think are such strong motivating forces that other forms of compensation pale in comparison. BzzAgent's members earn reward points, which they can cash in for prizes like DVDs and books—yet 87% of them never do.

Word of mouth has been around for ages—"Try the apple," said Eve—and it continues to prove resilient. A consultancy called the Keller Fay Group found that 18% of word-of-mouth marketing took place on the phone, and 72% face to face, despite the ubiquity of electronic communication. Or perhaps because of it. Inundated by ads, says Tremor CEO Steve Knox, "consumers have gone back to their most trusted source—family and friends."

Naturally, some people aren't happy about marketers' following them there. In 2005 the advocacy group Commercial Alert asked the Federal Trade Commission to investigate company-fed word of mouth and other buzz tactics, which the group says take authentic relationships and unduly commercialize them. Not all firms ask word of mouthers to disclose their corporate connection, but the Word of Mouth Marketing Association requires its 400-odd members to do so as part of its ethics code. There might also be a business case for disclosure. Word of mouth is built on trust, explains Gerald Zaltman, a sociologist and professor emeritus at Harvard Business School. Fessing up reinforces that.

But perhaps the biggest lesson companies can learn from word of mouthers is that there's an unmet social need among consumers to feel that their opinions matter. "They care what you have to say," says Carol Engels, a Vocalpoint mother in suburban Chicago. "That's what I like most." Smart companies find that, when they listen, they also get a shot at steering the conversation. ■

ILLUSTRATION FOR TIME BY DAVID PLUNKERT