

Bijlage VWO
2015

tijdvak 2

Engels

Tekstboekje

Memory and the internet

Henry Porter asks, "memory is being partly 1 the internet – what's the problem with that?" (We're smart enough to know we're stupid, 19 April).

The answer is plenty.

Ten-year-old children use their parents as memory banks but as they grow we expect them to remember important things for themselves. It's a crucial part of growing into adulthood.

Increasingly, I have to tell my tertiary research students that there are many things they have at their fingertips. I don't have time, in the middle of a conversation, for them to search their memory bank for what a protein is made of or for them to go off and look up the answer and come back each time they run into similar roadblocks. They need to know these things so that we can have effective (and rapid!) discussions about the things that matter.

In order for them to progress as scientists, they need to depend heavily on this now dying skill. That the increase in this problem is coincident with the rise of the internet is no coincidence.

Michael Morris

Sydney, Australia

The Guardian Weekly, 2013

A Necessary Cull

- 1 About 5,000 badgers are likely to be shot in the next six weeks in Somerset and Gloucestershire. Their deaths will be legal and planned under pilot schemes that have sparked protests from animal welfare organisations and celebrities such as Brian May and Joanna Lumley. The protests are ill-judged. The cull is not an attack on badgers: it is an attack on tuberculosis (TB). The Department for Environment, Food and Rural Affairs (Defra) is right to pursue this belated and necessary course to control the spread of the disease.
- 2 The problem is TB in cattle. Bovine TB is infectious and has spread rapidly over the past ten years. Nearly 40,000 cows were destroyed last year after they were tested positive for TB. The total over the past decade exceeds 300,000. That too is an issue of animal welfare, which imposes heavy costs on Britain's farmers.
- 3 There are various ways in which bovine TB can be transmitted but there is evidence that badgers are one of the causes, owing to the presence of their urine or faeces in farmyards. Prolonged tests, known as Randomised Badger Culling Trials, conducted by Defra, showed that removing badgers could reduce the incidence of bovine TB. Ireland and New Zealand, whose economies are far more reliant on cattle farming, have sharply reduced TB after badger or possum culls.
- 4 The cull has the weight of evidence on its side. The protesters have on theirs the mythology of the place of the badger in English country life.
- 5 That place is not static: the badger population has grown dramatically since it was made illegal to interfere with badgers' setts. Defra has a public obligation to control TB in cattle, lest it spread to other livestock and further still, perhaps to domestic animals too. Whatever the pantomime of protest, that duty remains. It is founded on sound science and environmental concern.

The Times, 2013

ECONOMICS FOCUS

Waist banned

- 1 Economists have long recognised the arguments for imposing taxes on goods and services whose prices do not reflect the true social cost of their consumption. Such taxes are known as "Pigouvian" after Arthur Pigou, a 20th-century English economist. Environmental taxes are an obvious example. There is also a Pigouvian case for duties on cigarettes, alcohol and gambling. Smoking increases the risk of cancer for those in the vicinity of the smoker; alcohol abuse and gambling are strongly associated with violence and family breakdown. Moreover, all three make up these costs, or "externalities", with a tax that adjusts the prices people pay to puff, booze or punt.
- 2 Support for another such tax, on junk food, is now spreading, especially in America. Congress is considering a tax on sugary drinks to help pay for the planned expansion of health-care-coverage. Some analysts would like to see broader duties on junk food. On July 27th the Urban Institute, a think-tank in Washington, DC, proposed a 10% tax on "fattening food of little nutritional value" that, it claimed, would raise \$500 billion over ten years.
- 3 The logic for a tax on fattening food may seem obvious. About one-third of Americans are obese, up from 15% in 1980. Fat people are prone to heart disease, diabetes, bone disorders and cancer. An obese person's annual medical costs are more than \$700 greater than those of a comparable thin person. The total medical costs of obesity surpass \$200 billion a year in America, which is higher than the bill for smoking. These costs are not all borne by the obese. When health-care costs are shared, obesity becomes a burden for everyone. Thanks to government health-care plans the slim pay similar premiums to the overweight.
- 4 But would a fat tax affect behaviour? Numerous studies have shown a relationship between the price of food, especially junk food, and body weight. As fast food has become relatively cheaper, so people have become fatter. A new paper from the RAND Corporation, another think-tank, suggests that taxing calories could have a sizeable, if gradual, effect on people's weight. The authors of the study look at changes in the weight and height of a large group of Americans aged over 50 between 1992 and 2004. They then calculate food-price indices that are skewed towards calorie-dense foods (so a change in the price of butter had more impact than a change in the price of vegetables). By controlling for individual and environmental influences on weight, such as income and health, they then measure whether food-price changes affect body-mass index (BMI). BMI, the ratio of weight in kilograms to the square of height in meters, is a common, if imperfect, gauge of whether someone is over- or underweight.
- 5 A person's BMI turns out to be hard to shift in the short term. A 10% increase in the calorie-heavy price index is associated with a small decline, of 0.22, in BMI within two years. But the effects are greater over the longer term. A 10%

increase in the price of calories results in a fall in BMI of one to two points over 20 to 30 years. Such a drop would eliminate about half of the observed increase in obesity in America since 1980.

- 6 10, the idea of tackling obesity via the tax system has some serious flaws. First, there is the question of what to tax. Sugary drinks may not be nutritious, but hamburgers contain some protein along with their fat. More important, junk food is not itself the source of the externality – the medical costs that arise from obesity. Unlike smoking, or excessive gambling and drinking, eating junk food does not directly impair the well-being of anyone else. And because obesity is determined by lack of exercise as well as calorie intake, its ultimate relationship with health costs is more tenuous than that of, say, smoking. It is possible to eat a lot of fatty food, exercise frequently and not generate any externalities. A more direct, though controversial, approach would simply be to tax people on the basis of their weight.
- 7 The distance between junk food and the medical costs of obesity means that a calorie tax could have 12. A new theoretical paper in the *Journal of Public Economics* even suggests that a tax on junk food could increase obesity, especially among physically active people. If junk food, which is quick and easy to obtain, becomes relatively dearer, people will spend more time shopping for fresh ingredients and preparing food at home. That could leave less time for exercise.
- 8 Even if perverse consequences of this type look improbable, a junk-food tax may have less impact than its advocates expect. New studies on the effect of cigarette and alcohol sin taxes suggest heavy users are less influenced by price changes than others. An analysis of data from the National Longitudinal Study of Adolescent Health shows that American teenagers who smoke more than five cigarettes a day are only one-third as responsive to cigarette prices as lighter smokers. A complementary study of data from America's Health and Retirement Survey shows that alcohol taxes are far less effective for that minority of heavy drinkers. The biggest consumers of fattening food may prove similarly resilient to price increases, so a fat tax may do little to improve health, at least for today's junk-food addicts. If these same consumers are poorer on average, it would also be regressive. One reason for this is that in some poorer neighbourhoods there may be little fresh food on sale. If junk is all there is, putting up its price will reduce real incomes and make little difference to eating habits and health. Like the foods they aim at, fat taxes look appealing but can have nasty effects.

Adapted from an article in *The Economist*, 2009

Social statistics

Ludi Simpson

1 GOT something big to say? Grab a statistic, it lends authority. Most people know perfectly well that statistics can support different angles on the same story. But who has the time to put together the whole picture for themselves?

2 In the UK, concern for the health of statistics — not least when it comes to statistics relating to health issues, such as patient waiting times, public-private health financing, and more — has 15

attempts to rescue the field from the spin of political and industrial lobbies. The UK Statistics Authority now oversees the production of official statistics independently of government, and is answerable only to Parliament.

3 Straight Statistics, a pressure group of legislators, statisticians and journalists, runs a website presenting statistics that have been "straightened out", having previously been twisted for political, business or personal advantage — a practice the organization says is "widespread — and often undetected".

4 Partiality is deeply embedded in statistics. Data collection generally costs so much that little will be counted unless it is a government priority. This holds as much for questions in fundamental surveys such as the 10-yearly national census as it does for one-off inquiries. So it is not only the twisting of statistics that needs addressing but the way they are produced.

5 This is the starting point for the UK group Radical Statistics, which held its 35th annual conference in London last month. The audience and contributors were bound together not just by an understanding of statistics: these were people who produce and live by statistics, a diverse bunch of researchers and commentators who like what they do but don't always like what is done with their skills. Or what is not done with their skills: that is the extra ingredient. If current statistics are shaped by their funders' priorities, who will produce statistics to fulfil other priorities — and what would those statistics look like?

6 Take the "league tables" that rank the performance of UK schools. Decades of work has shown beyond doubt that these divisive tables are 18. Once standard errors of uncertainty are attached, the vast majority of schools are very similar. Only the extreme outliers remain interesting. The best use of the tables



would be to screen for a few examples of best or worst practice, or ones which suffer from poor measurement.

7 So what might statistics aimed at improving schooling achieve? In their recent book *The Spirit Level*, Richard Wilkinson and Kate Pickett argued that societies with the most unequal incomes have the worst health and most crime. If they are right, we might look to reduce inequalities between and within schools, and later at work.

8 It's the same when it comes to employment. Figures purporting to measure unemployment tend to hide the full cost, not least by omitting people not claiming state benefits. Statistical skills could be applied to estimating how many of these missing unemployed there are, and how the figures are affected when governments change the rules. Can the priorities underlying the collection of statistics be changed? This is where it gets interesting. It's time for a new statistics of social justice.

NewScientist, 2010

How Much Is Enough? by Robert and Edward Skidelsky – review

based on an article by Larry Elliott

- 1 In 1928, a year before the Wall Street crash, John Maynard Keynes spoke to an audience of Cambridge undergraduates. The great economist told the students that by the time they were old men the big economic problems of the day would be solved. The capitalist system was capable of delivering such a sustained and steady increase in output, albeit in sometimes unsavoury ways, that people would eventually have all the material goods they could possibly want. They would need to toil for only 15 hours a week and could then spend the rest of the time enjoying themselves. Capitalism, Keynes argued, was a means – a rather distasteful means – to this end and, by implication, its supporters could be considered immoral.
- 2 Two years later the world was sliding towards the great depression, extremism and war, but Keynes saw the crash as merely delaying the day when society would be able to meet all its needs with far less effort. In one respect, Keynes was right. 22; indeed, the leaps in productivity have been even greater than he predicted. But he was completely wrong in his belief that workers would ever feel satiated by their material possessions, and devote more of their time to painting, reading or watching ballet.
- 3 So what would Keynes make of a world in which lavishly paid investment bankers work from dawn to dusk and then decamp at the weekend to country-house hotels where they are waited on hand and foot by a new servant class paid little more than subsistence wages? Not much, according to his eminent biographer, Robert Skidelsky, and his philosopher son Edward. In their book *How Much Is Enough?* they argue that the modern world is characterised by insatiability, an inability to say enough is enough, and the desire for more and more money. Economics, a narrowly focused discipline in which there is no distinction between wants and needs, has driven to the end of a cul-de-sac.
- 4 The book argues that progress should be measured not by the traditional yardsticks of growth or per capita incomes but by the seven elements of the good life: health; security; respect; personality; harmony with nature; friendship; and leisure. "The overall picture is not encouraging for the advocates of growth at all cost. Despite the doubling of UK per capita income, we possess no more of the basic goods than we did in 1974; in certain respects, we possess less of them."
- 5 This is perhaps a tad hyperbolic. 24, job security is much weaker than it was at the end of the golden age of postwar prosperity and the pressure on the environment has increased. Fewer people die horrible deaths from lung cancer than they did 40 years ago, though; the bonds of friendship are as strong as they

ever were (if manifested differently in a digital age); people are more aware of the need to live in harmony with nature; and in many ways Britain is a more tolerant, respectful place than it used to be. There is a danger of getting misty-eyed about a time that was not a golden age if you were poor, black or gay.

- 6 That said, the main thrust of the book holds true. There is more to life than gross domestic product and it is only recently that growth at all costs has become enshrined as the goal of economic policy. We live in a country divided into workaholics who have more money than they know what to do with and millions of unemployed and under-employed citizens struggling to make ends meet on the proceeds of work in the informal economy or claiming state benefits. In the middle there are the debt slaves who constantly worry about the mortgage. When the Skidelskys say that we ought to be able to do better than this, it is hard to disagree with them. They favour a society influenced rather less by capitalism and rather more by a more social market economy. Sprinkle in a bit of Keynesian liberalism and the good society is within reach.
- 7 Well, perhaps. *How Much Is Enough?* is a spirited polemic but it is not without its faults. The book starts and finishes well but has a long central philosophical section in which the disquisitions on Marcuse and Aristotle give the impression that the authors are showing off. They also have quite fixed views on what constitutes the good life. They approve of the opera and wine-tasting but not of watching TV, noting that Keynes's vision of middle-class culture spreading to the masses with the increase of leisure has not been realised.
- 8 The main problem with this book is one of political agency. The authors make a series of sensible suggestions for how the good life could be attained: a basic citizens income, curbs on advertising to rein in consumerism; a tax on financial transactions. Where they are less convincing is in sketching out how these policies will be effected. "A sustained effort should be made to raise the share of income received by teachers, doctors, nurses and other public service professionals," they say. "This will require a higher rate of taxation and for that reason will encounter more political resistance than in countries which start with more equal income distribution." You bet it will.

guardian.co.uk, 2012

How we should commemorate the Great War

Sir, I am very pleased to see that there will be a commemoration of the centenary of "the war to end all wars" (letter Oct 11, and report Oct 12). However, the story of how the conflict came to be is as important as the remembrance of the war itself, if not more so.

Yes, our society should see how the consequences of the war shaped our nations, our societies, our economies and our politics. But the lessons of what caused the war to be conducted are just as relevant today as they were a century ago. Please let us bring into focus all that is needed to prevent future conflicts as well as the importance of marking the loss of so many innocent lives.

DAVID WOOD

Malvern Wells, Worcestershire



Sir, Originally, after the First World War, the wearing of poppies and the observances at the Cenotaph¹⁾ evolved as signs of the grief felt by almost every family in the land and were a public statement of determination that the recent horrific conflict should be the war to end all wars. Today, for many people, wearing a poppy has become a symbol of patriotic pride and of "standing shoulder to shoulder" with the fighting services. This is a subtle, but significant change in the symbolism.

The most appropriate way to mark the centenary of the First World War would be to review our traditional pattern of Remembrance observance and amend any aspects which might, however inadvertently, glorify, sanctify or sanitise the use of armed force. The best way to honour all those who have died in the conflicts of the past 100 years is to ensure that their descendants are not called upon to make the same sacrifice.

TED HARRISON

Hawkinge, Kent

Sir, What we should reflect on first are the origins of that war. Three imperial families were locked into personal commitments after a political murder, at a time when expressions of nationalism had reached some very aggressive levels among many peoples of Europe, including the British.

RICHARD HILL BROWN

Portsmouth

Sir, While I applaud the call for more education about the Great War for the generations who know little about it, may I also suggest that those involved in such education should read Siegfried Sassoon's two war memoirs, to throw some light on the perplexing issues of the psyches of the millions of young men who fought and existed bravely, and preferred to forget.

ROBERT PERKINS

Warwick

Sir, My grandfather was killed at Passchendaele in 1917. Until this summer my family knew little about his role in the war or who he really was. We then began a rewarding journey of research using all online and other resources available, and the result has been quite remarkable. We now feel we know him better, and have learnt so much about the sacrifice which he and others made; and we are planning a pilgrimage to his grave in Belgium.

May I commend this experience as a truly fulfilling way for families who lost a loved one in the Great War to mark the centenary in a personal way.

BERNARD KINGSTON

Biddenden, Kent

Sir, The best tribute to the millions whose lives were lost or damaged as a result of that war would be the conclusion by the nations of Europe of a firm and stable settlement of their relationships. The opportunity is there. The time is ripe.

JAMES R. FELLS

Petersfield, Hants

The Times, 2012

noot 1 The Cenotaph is a war memorial in London.

Fountains of youth

Long For This World: The Strange Science of Immortality

by Jonathan Weiner

Ecco 310pp \$27.99

The Youth Pill: Scientists at the Brink of an Anti-Aging Revolution

by David Stipp

Current 308pp \$26.95

Susan Okie

Washington Post

- 1 *Long for This World* and *The Youth Pill* are two striking new books on the same subject – science's current efforts to slow ageing and lengthen human life span. In *Long for This World*, Pulitzer prize-winning science writer Jonathan Weiner surveys the field as if from a mountain top: he's intrigued, yet detached and sceptical, frequently digressing from science to discuss how religions and cultures have dealt with the problem of mortality and to ponder whether the lust for ever-longer lives is a good thing. In *The Youth Pill*, science and business journalist David Stipp hunkers down in the trenches with researchers as they test compounds that offer the hope (so far based mainly on animal studies) of warding off many of the ills that afflict ageing bodies. Although no drug has yet been shown to extend the human life span, Stipp argues that such remedies are potentially just around the corner. 30, resveratrol (found in small amounts in red wine) is being marketed as a dietary supplement even though no studies have yet established whether taking large doses over long periods is safe and effective.
- 2 Weiner usually structures his books around individual scientists, and for this one he has chosen Aubrey de Grey, a brilliant but eccentric Cambridge computer scientist who has become an acknowledged leader in devising strategies to vanquish ageing. As a protagonist, De Grey is unappealing: he's good at seeing the big picture, but he's described as an arrogant man who takes pleasure only in working, swilling beer and punting on the river Cam. Weiner uses their encounters to lay out current theories about why we age. Ageing is not a biological constant: some organisms (hydras and sponges, for example) seem to be virtually immortal, and even some closely related groups of animals (such as bats and mice) have dramatically different life spans. Human ageing stems from progressive damage to our cells and their DNA – caused by threats from within, such as dangerous by-products of metabolic reactions, and from without, such as exposure to radiation or mutagenic chemicals. It's also thought to result from inherited mutations that have persisted in our genomes because they improve our reproductive success, but take a toll in later life.

- 3 Despite his overly cheerleading tone, Stipp does a better job than Weiner of explaining recent progress and conveying the mounting excitement of scientists in the field. His central character is David Sinclair, a brash Harvard researcher whose 2006 study of resveratrol's life-extending effects in mice ignited the interest of investors, drug companies and the general public. Stipp, a former reporter for *Fortune* and *the Wall Street Journal*, also interviewed other scientists in the forefront of the search for compounds that, like resveratrol, appear to activate genes involved in animals' response to environmental stress. Some of these genes were discovered in mutant worms or fruit flies that lived unusually long; others were found by researchers exploring why restricting food intake lengthens life span and conserves vigour in virtually every species that's been studied.
- 4 Weiner notes that the number of centenarians on the planet has more or less doubled with every decade since 1960. While Stipp suggests that anti-ageing drugs could deliver a free lunch, it seems more likely that there will be costs — for the individual, for society, for the planet.

2010

Electric plant auras

Douglas Heaven

- 1 PLANTS are not the silent types they lead us to believe. As well as sending out chemical signals to warn others of an approaching predator, it seems they may even communicate with would-be pollinators via electrical signals. As bees fly through the air, they — like all insects — acquire a positive electric charge. Flowers, on the other hand, are grounded and so have a negative charge.
- 2 To see whether bumblebees (*Bombus terrestris*) are able to make use of these signals, Daniel Robert at the University of Bristol, UK, and colleagues made artificial flowers. These looked and smelled identical but some were filled with sucrose and others with quinine, a substance bees don't feed on.
- 3 At first, the bees visited these flowers at random. But when a 30-volt static electric field — typical for a 30-centimetre-tall flower — was applied to the blooms filled with sucrose, the team found that the bees could detect the field from a few centimetres away and visited the charged flowers 81 per cent of the time. The bees reverted to random behaviour when the electricity was switched off.
- 4 The result suggests the bees used the electric field as an indicator of the presence of food, much like they use colour and scent. 37, they foraged at random, showing that they hadn't just learned the location of the sucrose flowers. "That was the first hint that had us jumping up and down," says Robert.
- 5 Next, the team looked at whether the bees were influenced by the shape of the electric field, which is determined by a flower's shape. By varying the shape of the field around artificial flowers that had the same charge, they showed that bees preferred visiting flowers with fields in concentric rings like a bullseye: these were visited 70 per cent of the time compared to only 30 per cent for flowers with a solid circular field.
- 6 The researchers speculate that flowers have evolved different shaped fields in the competition to attract pollinators. "Flowers are a ruthless expression of evolution," says Robert. "They exploit bees."
- 7 The researchers showed that when a bee visits a flower it transfers some of its positive charge, incrementally changing the flower's field. With repeated visits, the charge may alter significantly, which could tell other bees that the nectar supply has been diminished. "Electricity is a way to change cues very quickly: 'I look perfect, I smell nice, but my electrics aren't quite right — come back later!'," Robert says.



- 8 Robert Raguso at Cornell University in Ithaca, New York, agrees that the changing electric field may signal that nectar is running low. "Nectar or pollen can be removed quickly by a pollinator, creating a situation in which the just-visited flower still advertises, dishonestly," he says. The rapid change in electric charge would reduce those out-of-date cues.

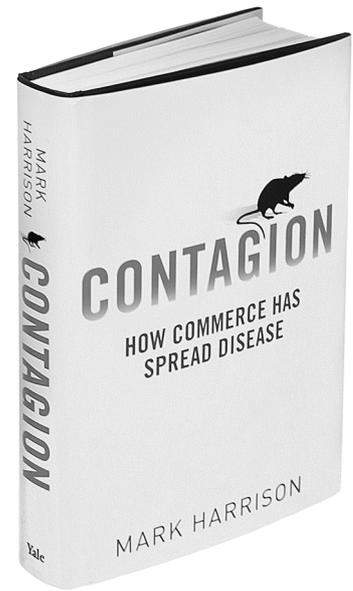
NewScientist, 2013

No bugs on board

Contagion: How commerce has spread disease
by Mark Harrison, Yale University Press, £25/\$38

Reviewed by David Cohen

- 1 ANYONE who has travelled through an airport has surely noticed the rather long list of items that are prohibited on board a plane. But along with the more understandably forbidden articles, such as guns, knives, grenades and canisters of petrol, there is often a list of seemingly innocuous cargo: fresh foodstuffs. In Australia, even muddy shoes are frowned upon. It may seem a bit excessive, but these prohibitions are the climax of a long historical trend and are motivated, as Mark Harrison reveals in *Contagion*, by a mixture of public-health, food-safety and protectionist trading policies.
- 2 Harrison's erudite study of the impact of global commerce and travel on the spread of disease charts how the responses of governments and traders to outbreaks evolved, from the Black Death some 650 years ago, to the recent outbreaks of SARS and avian flu. As Australia's muddy-shoe ban intimates, disease vectors are a serious concern. Viruses and bacteria that travel in soil or food can have a disastrous impact on crops and livestock, and the spread of human diseases such as yellow fever and malaria can be devastating for public health. A particularly deadly strain of malaria was exported from Africa to the rest of the world by the slave trade, for example.
- 3 It was as a consequence of the Black Death that "quarantine" came into vogue as the preferred means of disease control. Simultaneously it became a potent weapon of economic warfare. Harrison goes to great pains to point out that throughout history, governments have needed little encouragement to adopt quarantine and import bans as weapons of foreign policy and economic advantage, often with tragic consequences for the "victim" states where the infections originated.
- 4 *Contagion* is a thorough, well-researched and thoughtful tome, and Harrison includes some interesting asides about the history of medicine. But be warned, his writing style is academic in nature and dry in tone. Not as infectious as one might have hoped.



NewScientist, 2012

>> POLICY

Bringing Science into the Clinic

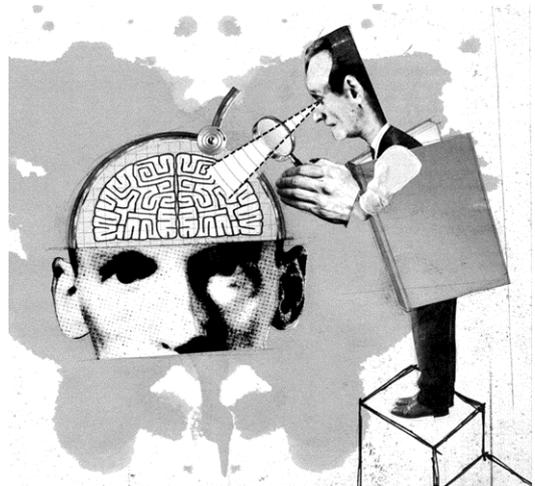
An accreditation program could help bring better treatments to patients

The high cost of health care is no secret. Revamping clinical psychology could be one way to make the system more efficient — while also helping psychologists better serve their patients, according to a recent report from the Association for Psychological Science. The report details an accreditation system that has been in development for two years, which will certify training programs that focus on scientifically validated treatments and instruct their students in the scientific method. The system would also create a "seal of approval" to show prospective patients that a psychologist received such an education, the report says.

"Many of the people being trained today aren't trained to understand and apply science to patients out in the real world, so patients aren't getting the treatments most likely to help them," says Timothy Baker, a psychology researcher and professor of medicine at the University of Wisconsin–Madison and co-author of the report. Clinical psychology continues to depend on outdated, ineffective strategies of diagnosis and treatment — and surveys show individual practitioners often value their own experience or a "hunch" over scientific evidence, ultimately hindering their ability to effectively help patients. "We're simply not taking advantage of what is known in scientific research," Baker says.

With a stronger scientific background, psychologists not only will be able to better choose treatments for patients and gauge therapy's effectiveness, but they also could become "more sophisticated users of psychological research," Baker notes. "They'll contribute to research and improve treatments."

—Allison Bond



SCIENTIFIC AMERICAN, 2010