



Cruel to be kind

Humans are a nasty species. That might be because deep down we really care, says John Whitfield



Noble sentiment – but what really motivates people to protest against the bailout?

AROUND the time of the G20 summit in London on 2 April, the streets of cities across the world were filled with people protesting against the excesses of the banking bosses, among other things. Chances are you agreed with the sentiment. Chances are too that if you had been asked to put your hand in your pocket to fund a campaign to seize their bonuses, even if you wouldn't see any of the money, you'd have been sorely tempted.

If so, congratulations: you have just confounded classical economics, which says that no rational person should ever reduce their own income just to slash someone else's. And yet that's exactly what we do. Classical economics, it turns out, is a pretty terrible predictor of how we actually behave.

But why do we inflict pain for no gain? On the face of it, it is rather a perverse way of going about things. Does spitefulness stem from an affronted sense of fairness? Or something altogether darker: envy, lust for revenge – or perhaps even pure sadism?

It might be all those things. Economists, anthropologists and evolutionary biologists have been teasing out how, used judiciously, spiteful behaviour can be one of our best weapons in maintaining a fair and ordered society. But intentions that are noble in one situation can be malicious in another – making spite a weapon that can all too easily backfire.

Human spite is a complex affair. It is not pure selfishness in the Darwinian sense, like a stag that picks a fight with another. Though it might be gored in the process, the stag is actually acting in its own best interests. If it ends up with more mates, then the chances of passing on its genes are increased, an evolutionary prize worth fighting for.

Nor is spite as we practise it true spite in the biologist's sense. That would involve diminishing our own evolutionary fitness just so we can lower that of some unrelated individual. That behaviour exists, but it is hard to come by, says Stuart West, an evolutionary biologist at the University of Oxford. There is a particular type of parasitic wasp, for example, some of whose larvae do not develop into adults capable of reproduction, but instead kill unrelated larvae of the same species, freeing up resources for their siblings. And in several types of bacteria, spiteful cells produce chemicals that kill both themselves and other members of their kind, unless they carry a genetic marker of relatedness to the suicidal individual. That makes microbes the kings of true spite, says West.

Human spite is something altogether subtler. Psychological motivations and social contexts influence our course of action. That requires a very special set of circumstances and skills, says Marc Hauser, a biologist at Harvard University. First, it needs a stable social grouping in which unrelated individuals interact regularly, and in which costs incurred retain relevance. What's more, you must also be able to spot when you're getting a raw deal, identify the guilty party, and be willing to do something about it.

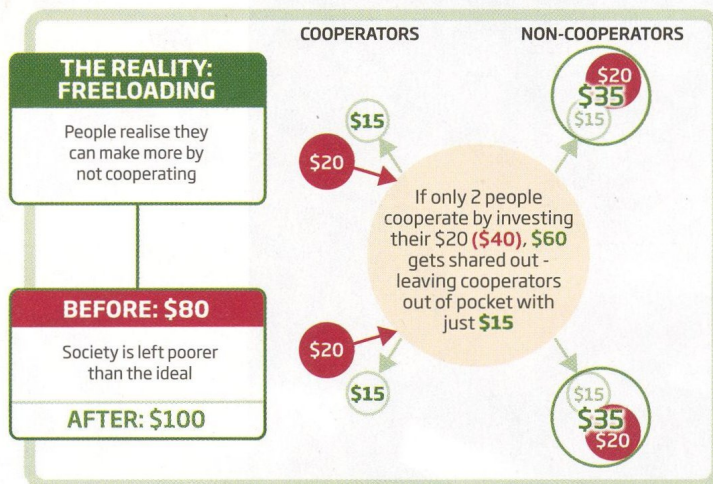
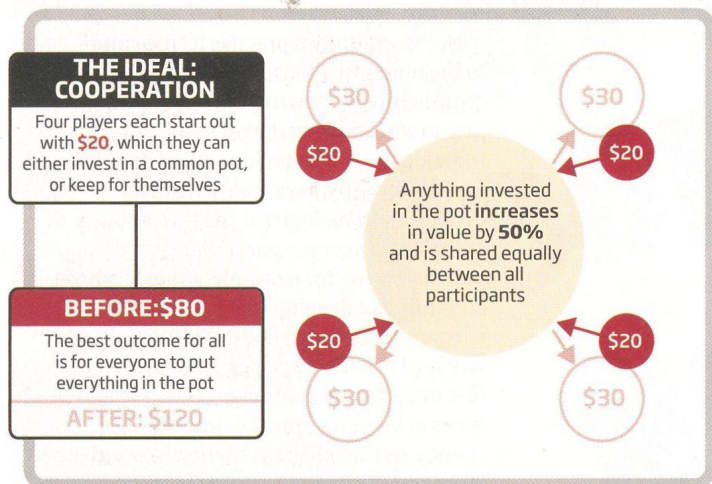
That requires what Hauser has dubbed "floodlight" intelligence – the ability to see the big picture and combine many cognitive inputs over time. That, he suggests, might make both spite and reciprocity – the doing and returning of favours – uniquely human qualities. The "laser-beam" intelligence of most animals might be superb at solving individual problems, but it is simply not good enough at generalising experience to develop such complex behaviours (see "Is spite uniquely human?", page 44).

Naughty but nice

If that's true, the floodlight is switched on at an early age. At a meeting of London's Royal Society in January, Hauser reported preliminary results from experiments in which children between 4 and 8 years old were offered varying numbers of sweets for themselves and another child unknown to them. They had to pull either a lever delivering the sweets, or another that tipped the sweets out of reach. Infants of all ages almost always rejected one sweet for themselves if the other child was set to receive more. The older children often also rejected sweets if they

Why we should all just get along

Laboratory experiments show that we all benefit the most when we cooperate - but it only works when we know cheats will be punished



got more than the other child. Where that kind of concern about inequality disappears is unclear, because we adults certainly don't have it. "Imagine you have four dollars on your side, and there's one on the other side," says Hauser. "It's highly unlikely that you'll dump your four dollars." But the negative, spiteful version persists: most of us would be quite prepared to sacrifice a dollar to stop someone else getting four. "Spite is the ugly sister of altruism," says Hauser.

What motivates this ignoble behaviour?

A clue is provided by laboratory experiments known as public goods games. In a standard public goods game, each participant is given the same amount of money, some or all of which they can pay into a common pot. What's in the pot is then multiplied by the experimenters and divided equally between the players, so that even those who put in nothing get a share of its contents. The best outcome for all is if everyone puts their cash into the pot. But that does not naturally happen. In repeated rounds of the game,

some individuals hold on to their own cash and hope to leech off other people.

Deterred by these freeloaders, the players who at first cooperate start to hold onto their cash. Cooperation breaks down entirely, and the whole group misses out on the bonus - society as a whole suffers (see diagram, above). But allow participants to pay for the privilege of punishing defectors, and it is a very different game. Cooperative players eagerly part with still more of their cash to punish cheats - who soon learn that cooperation is

Is spite uniquely human?

Are we humans really alone in our spitefulness? It makes sense to take a peek at our nearest relatives to find out. "Chimpanzees are very competitive," says primatologist Keith Jensen of the Max Planck Institute for Evolutionary Anthropology in Leipzig, Germany. "They're good candidates for spiteful motivations."

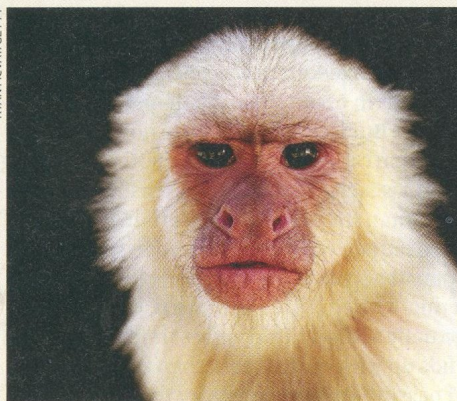
To test that, Jensen set up an experiment with two chimps, the first of which could pull a rope to deprive both it and the other of a food reward (*Proceedings of the National Academy of Sciences*, vol 104, p 13046). If the second chimp stole its food, the first chimp was quick to pull the rope. But if Jensen took the first chimp's food and gave it to the second, they pulled far less often. On that evidence, chimps don't do envy. "Just having another chimp better off than they are doesn't affect them," says Jensen.

Frans de Waal, a primatologist at Emory University in Atlanta, Georgia, thinks the results

Don't treat a capuchin unfairly

are inconclusive - the chimps sometimes pulled the rope when no food was available, so might simply have not understood the experiment. Given what we know about chimpanzees' intellectual and social skills, he says, a sense of fairness - and so a capacity for spite - would not be a surprise.

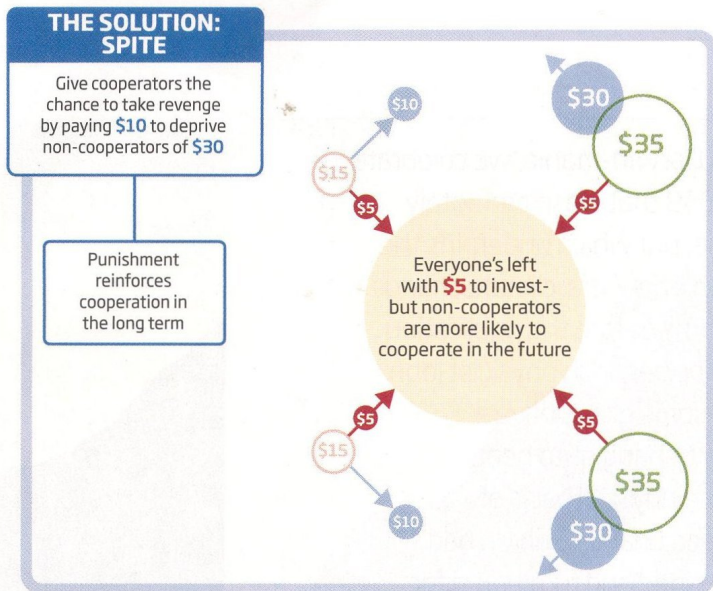
De Waal's own experiments suggest that



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capuchin monkeys are sensitive to fairness. If another monkey gets a tasty grape, they will not cooperate with an experimenter who offers a piece of cucumber (*Nature*, vol 425, p 297). A similar aversion has been spotted in dogs (*New Scientist*, 13 December 2008, p 12), and even rabbits seem affected by inequality, leading de Waal to believe that an ability to detect and react to injustice is common to all social animals. "Getting taken advantage of by others is a major concern in any cooperative system," he says.

But do social animals lash out against inequality in the same way as humans do? Marc Hauser and his colleagues Katharine McAuliffe and Kyle Foreman of Harvard University are experimenting with cotton-top tamarins, another species of monkey, to find out. Preliminary results show that some monkeys would forfeit a piece of food if it stopped an unrelated monkey getting more. That looks a lot like spite - but the monkeys' true motivations remain unclear. Until we understand more, says Hauser, we remain the lone champions of spite.



the cheaper option (*Nature*, vol 415, p 137).

Simply, it seems that niceness needs nastiness. Our sense of fairness and our willingness to inflict damage on one another combine to encourage contributions to the common good and deter people from cheating. Researchers call this altruistic punishment. "But at the end of the day, it's still spite," says economist Benedikt Herrmann of the University of Nottingham, UK. The benefits of this constructive spite might not be immediate, but they are real – in the long run, we all benefit more if we can ensure others in society toe the line.

Our brains are certainly wired to respond positively to this constructive form of spite. Although we might lose out financially, scans show that a region called the striatum, which responds to rewarding experiences, lights up during altruistic punishment (*Science*, vol 305, p 1254). So, problem solved. Spite is in our own best interests and our brains reward us for it, so we should welcome it, right?

Not quite. The problem is that it's not only doing bad things to bad people that makes us feel good. Recent studies have shown how the striatum responds in the same way to *schadenfreude*, when we take a morally dubious pleasure in others' misfortunes (*Science*, vol 323, p 937). Adolescent boys with aggressive conduct disorder show similar brain activity when they watch a video of someone hurting another person (*Biological Psychology*, vol 80, p 203).

Sadism aside, it is easy to imagine why evolution might have wired us up like this, according to Hidehiko Takahashi of the National Institute of Radiological Sciences in Chiba, Japan, leader of the *schadenfreude*

study. "Altruistic punishment might bring an indirect benefit to us from society, and *schadenfreude* a direct benefit from a rival." But it also suggests that the line between the cooperative and competitive prompts for spiteful behaviour is blurry and subjective. If the prospect of bankrupting a few fat cats gives us a twinge of pleasure, it is hard to say whether that is because we believe they have robbed society, or because we are envious of their wealth and success and happy to see them toppled.

"The problem with spite is that it's not just doing bad things to bad people that makes us feel good"

Daniel Zizzo, an economist at the University of East Anglia in Norwich, UK, points out that we shouldn't necessarily feel too bad about being bad – as long as we don't take it too far. "Envy has a stigma attached to it," he says, "but it's a powerful motivation towards egalitarianism and entrepreneurship." But it can also be used to cut down anyone who seems too clever or successful, possibly stunting innovation to the detriment of society. Accusations of witchcraft, which are often levelled against the successful, are a classic case in point, he says. If we can't raise ourselves up, we might find dragging someone else down just as good.

And there is evidence that, in some parts of the world, the rewards of spite can lead to just that kind of counterproductive behaviour. Last year Karla Hoff, an economist at the World

Bank who is currently working at Princeton University, and her colleagues reported the results of experiments conducted in villages in the Indian state of Uttar Pradesh (*American Economic Review*, vol 98, p 494). In these tests, two players started out with 50 rupees each. The first could choose to give his to the second, in which case the experimenters added a further 100 rupees, giving the second player 200 rupees in total. The second player could decide to keep the money for himself, or share it equally with the first player. A third player then entered the game, who could punish the second player – for each 2 rupees he was willing to spend, the second player was docked 10 rupees.

The results were startling. Even when the second player shared the money fairly, two-thirds of the time the newcomer decided to punish him anyway – a spiteful act with seemingly no altruistic payoff. "We asked one guy why," says Hoff. "He said he thought it was fun."

Hoff found that high-caste players were more likely to punish their fellow gamers spitefully than low-caste players, leading her to suggest that context is everything. It is not that people in Uttar Pradesh are nastier than elsewhere, but rather that the structure of their society makes them acutely conscious of status. The sensitivity of higher castes to their position makes them tend not to support any changes that threaten to level the social hierarchy, such as development projects. But higher castes can also put others down, safe in the knowledge that "untouchables" are unlikely to strike back. "If you're low caste it's dangerous to rise in status," says Hoff. "You'll get beaten up or worse."

The moral seems to be that, while spiteful behaviour can be a powerful force for keeping a society functioning smoothly, the structure of that society must be able to contain and channel those spiteful urges. "Social norms are a moral scaffold that keeps aggression and spite under control," says Herrmann. Societies that have strong laws tend to be those where individuals have a strong sense that they should treat strangers fairly – and are willing to punish cheats informally through gossip and ostracism.

So if you want to squeeze the bankers till their pips squeak, it might indeed be the case that spite is right. But it pays to examine your motives carefully. Woe betide a society in which altruistic punishment gives way to an envy-driven contest where everyone stands to lose. Hoff likes to illustrate the dangers with a Russian joke. A genie appears to a man and says: "You can have anything you want. The only catch is that I'll give your neighbour double." The man says: "Take out one of my eyes." ■

John Whitfield is a freelance writer based in London