

Snow blind

Have a bet on a white Christmas, but don't fall for an old chestnut.

It just took some treetops to glisten and some children to listen for Bing Crosby to enjoy a white Christmas. Bookmakers are a more cynical bunch, so usually demand to see at least a single white flake fall during the 24 hours of 25 December. The chances of snow at *Nature* HQ this weekend are diminishing as Britain basks in unseasonably mild conditions — bookmakers put the odds of an official white Christmas in London at about 10 to 1.

If that seems too long a shot, then science offers a way to make the bet more attractive to punters. By combining it with a second bet on an event much more likely to happen, bookies can exploit a psychological tic called the conjunction fallacy. Odds, for example, of a cover of the Rolling Stones' classic 'You can't always get what you want' reaching the UK Christmas number-one slot are a much shorter 9/4 — it's one of the favourites. (All odds correct as *Nature* went to press.) And although logic and statistics tell us that the chance of both events occurring must be lower than either of the single events alone, gamblers routinely fail to recognize that.

Study after study shows that pairing with a dead-cert makes an unlikely wager seem more — not less — likely to happen. And that makes people more willing to put money on an outsider. This logical illusion can explain much fixed-odds betting on sport, including football. Gamblers routinely think there is more chance that West Bromwich Albion will win at Arsenal on Boxing Day (9/1) if the wager is combined with a Manchester United home victory over Sunderland (2/9).

Exactly why this happens is not clear, but it seems that some gamblers play the odds off against each other in their heads, and assume — incorrectly — that the combined chance of the two is an average of the odds, that the extreme likelihood of the second option somehow tempers the outlandishness of the first. It can be an expensive mistake.

With supreme knowledge of the human condition, one might think that scientists would be immune from making rash bets. Not so. This

year, astrophysicist Shrinivas Kulkarni has lost a US\$1,000 wager on the origins of fast radio bursts, and another astrophysicist, David Wiltshire, has stumped up \$200 for a lamp after losing a 10-year wager with a colleague on the role of the cosmological constant in dark energy.

Although such simple bets between researchers (sometimes friendly and sometimes not so) are a long-standing feature of science, perhaps the most lucrative are those in which scientists (just like bookmakers) pit their calculated professionalism against the optimism and emotion of those who follow a lost cause. This year has also seen climate scientists cash in on bets made with sceptics about the continued warming of the planet. Indeed, the annual meeting of the American

Geophysical Union last week had a session dedicated to betting on climate change. Bets accepted or refused can be a good way to gauge how firmly a sceptic truly believes their contrarian position, because wagers typically follow strongly and honestly held (however unlikely) opinions. (Hence, some fans of Sunderland will see the odds of 14/1 on them winning the above match as too good to turn down.)

Some events baffle punters, scientists and bookmakers alike — and 2016 has seen plenty of those. So who would dare to argue that a theoretical 'social-physics' model — used, among other things, to predict the behaviour of plastic crystals — would do a worse job than pollsters and experts at predicting the results of political votes such as this year's Brexit referendum and US presidential election? Physicists last month published such a mean-field model, which they say describes the dynamics of two-group conflicts on the basis of the interactions between group members, opponents and how willing people are to change their minds (H. T. Diep *et al. Physica A* **469**, 183–199; 2017).

The model's output shows whether each side in a political dispute will tend towards negotiation or conflict, and the often wild swings and oscillations in their attitudes towards each outcome along the way. It is not a tool of prediction, the physicists caution, but rather one of anticipation for strategic purposes. That seems a sensible approach given recent events, which have shaken faith in predictions of all sorts. So in that spirit, as 2016 draws to an end and as Bing almost sang: your days may be merry and bright, and all your Christmases may be white. ■

“Bookies can exploit a psychological tic called the conjunction fallacy.”

On retirement

When great colleagues end their careers, employers should recognize their value.

According to the US psychologist David Hershenson, people who retire can experience up to six separate statuses. Retrenchment comes when they cut back on work and principal employment, and Exploration sees them think about what activities to do next instead. In their Try-out status, retirees see how well suited they are to new activities (including inactivity), and Involvement marks their long-term participation in pursuits they enjoy and can stick with. When new options present themselves, retirees are faced with Reconsideration. And should they move on from an activity, or indeed return to work, then they Exit. Not coincidentally, the six statuses together form the acronym RETIRE (D. B. Hershenson *J. Aging Studies* **38**, 1–5; 2016).

It may seem contrived, but the study of retirement — and finding ways to investigate it — is an important business as the population ages. Not least is the question of who should be paid to retire, by whom and when. As funds dwindle, retirement ages are creeping up. But

do some workers deserve an earlier break from the daily grind than others? The government of the Netherlands has put some serious thought into whether people in some professions — particularly occupations involving heavy manual labour, such as construction — should have their retirement age fixed or reduced, even while people in less-demanding jobs see their retirement ages rise (N. Vermeer *et al. Labour Econ.* **43**, 159–170; 2016). In the United Kingdom, the opposition Labour Party leader Jeremy Corbyn has suggested something similar. As Jane Austen wrote in *Sense and Sensibility*: “It isn't what we say or think that defines us, but what we do.”

Policies on retirement, then, and the studies that inform them, need to broaden their assessment to include an earlier status: work. If retirement is a well-earned break after a long and productive career, how can researchers distinguish those employees who should enter it before some and after others?

At *Nature* we have our own internal scoring system, with its own (slightly) contrived acronym. We look for people who perform Work that is consistently Excellent and Notable, and that has helped to define the cultural and scientific Zeitgeist for a significant time — usually measured at about 40 years. We call it the WENZ measure. Every organization should have a WENZ. And when people with the WENZ factor retire, they should do so in the full and certain knowledge that their contribution has been valued by colleagues. More than that, they should know they will be missed. ■