

The Many Lives of Superstition

October 01, 2008

We're nearing the end of a long campaign season in which every factor under the sun has come into play: Issues of age, race, gender, experience/inexperience. Round and round it goes, how it ends, nobody knows. At least one of the candidates on the ticket is not leaving anything up to chance. Famously superstitious, John McCain avoids taking salt shakers handed to him, tossing his hat on a bed, or commenting on his prospects without touching wood. An aide always has his lucky pen at the ready. And, a confirmed triskaidekophobe, he always carries 31 cents in his pocket (that's 13 backwards) — in lucky coins. Also, since his campaign headquarters happened to be on the 13th floor of an Arlington, VA office building, he renamed the floor. He's a powerful guy. It's the "M" floor now.

McCain's isn't the first campaign to make room for superstitious thinking. For example, when running Bill Clinton's 1992 campaign, James Carville was rumored to not change his underwear when his candidate was on a hot streak. McCain is reported to have developed his habits in his past life as a Navy pilot; aviation is another occupation that, like gambling and sports (see Sidebar), seems to invite more than its share of rituals aimed at appeasing fickle fate. When there's a lot at stake, it can't hurt, right?

It appears to be human nature to believe our thoughts, our words, or our rituals can influence remote outcomes. Yet in his classic 1948 paper on the subject, "'Superstition' in the Pigeon," B.F. Skinner revealed that superstition isn't particularly human at all (Skinner, 1948). If you put a hungry pigeon inside a box that automatically dispenses food at regular intervals, a funny thing happens: After a while, the pigeon will acquire some sort of idiosyncratic behavior or tic — perhaps spinning in circles, or bobbing its head rhythmically, or some other strange, random, senseless behavior. In effect, the pigeon has developed a superstition about the source of the food and behaves just like a baseball player before a big game or a candidate before an election: just doing whatever it thinks it takes to guarantee a good outcome.

What made a fool of Skinner's pigeons is what makes fools of us all: conditioning. Specifically, what APS Charter Member Stuart A. Vyse (Connecticut College) calls "conditioning by coincidence" (Vyse, 1997, p. 71). Essentially, the food was dispensed, and the pigeon thought that whatever it happened to be doing at the time was the cause, so it kept on doing it. Subsequent feedings serve only to reinforce the behavior: The pigeon repeats its action, the food keeps coming, so why mess with a good thing?

If Skinner's pigeons had spoke Latin they may not have been so easily tripped up. Their error is a classic case of the common logical fallacy *post hoc ergo propter hoc* — "after this, therefore because of this." Temporal contiguity does not imply causality, as every good scientist knows, but the brain is a voracious and often indiscriminate pattern detector, always on the lookout for connections among phenomena and between the individual's own actions and favorable or unfavorable outcomes. Superstition arises from the natural tendency to seek connections that could, even remotely, be useful in controlling the world.

An Acausal Connecting Organ

I'm writing about coincidence and superstitious connections, my thoughts wander, I'm thinking about my father, when unexpectedly the phone rings and — lo and behold — it's him on the other end. The famous psychiatrist and mystic Carl Jung coined the term “synchronicity” to describe meaningful coincidences that appear to defy the laws of probability (Jung, 1960/1973). In Jung's theory, unconscious archetypes appear to exert an influence on events in the world. His idea made sense not only to the magically minded (and to Sting, who wrote a hit song about it), but even to some hard-headed scientists at a time when people were first grappling with the implications of indeterminacy in physics. The rigorous theoretical physicist Wolfgang Pauli (one of Jung's patients) was persuaded that uncertainty on a quantum scale could allow the unconscious mind to have a hand in events.

As a theory of how things actually occur in the material world, synchronicity is easily debunked by the statistician. People are notoriously bad at understanding probabilities and statistics, and they generally underestimate the likelihood of “impossible” coincidences (see Vyse, 1997, for a discussion). The law of large numbers ensures that improbable events happen all the time. What's more, the *egocentric bias* causes us to disproportionately notice chance occurrences that have some bearing on our own interests and priorities. Ruma Falk, a specialist in the psychology of coincidence at Hebrew University, found that participants were more surprised by coincidences that happened in their own lives (either in the past or in the course of an experiment) than they were by identical coincidences that happened to another person. A coincidence that happens to another person, she says, seems unremarkable, just “one of many events that could have happened” (Falk, 1989, p. 477).

So the odds of my father calling on the phone at exactly the moment I am thinking of him are probably a lot larger than I imagine and are probably not too different from the odds against any number of other chance occurrences that I fail to notice because they don't matter to me personally. If they happen to someone else, I'll be much more sober in my interpretation.

Whether or not the coincidence of a phone call from someone one happens to be thinking of is random from the point of view of the indifferent universe, it is meaningful in terms of the associative links in one's head, and those links bias how we perceive and interpret the world. To be fair, this was part of Jung's point: Coincidences, in the end, tell us about ourselves. If we take it simply as a description of the brain's appetite for “meaningful” association and not as a statement of how the external world works, his oft-quoted definition of synchronicity, “an acausal connecting principle,” fits quite well. The brain could be described as an “acausal connecting organ” — an insatiable meaning maker.

The Power of Connection

The acausal connections that give rise to superstition may be temporal, as in the case of conditioning by coincidence, and they may also involve physical contact or similarities in form between objects. Perhaps the most familiar example of superstitious or magical thinking involves objects that are imbued with special significance because of what they resemble — for example, a picture of one's spouse or a religious icon. The *law of similarity* holds that a representation is linked to what it represents. People have difficulty throwing darts at a picture of a baby, for example (King, Burton, Hicks, & Drigotas, 2007). Objects also become special by virtue of what or whom they have been in contact with — the *law*

of contagion.

The laws of similarity and contagion are part of what is known as *sympathetic magic* (Rozin & Nemeroff, 1990). Early anthropologists readily identified such forms of reasoning in non-Western cultures, but argued that they were really universal. What makes such beliefs superstitions is when they run counter to the causal theories held in one's culture. Vyse (1999) defines superstition as "beliefs or practices groundless in themselves and inconsistent with the degree of enlightenment reached by the community to which one belongs" (p. 19). One person's enlightenment might be another person's superstition, of course, and a devout Catholic might justifiably balk at being called superstitious when kissing a crucifix, as it reflects his consciously held belief system and that of his community. Yet like most people in our culture, he might readily cop to the charge of superstition if he wears his lucky sweater to a poker game.

In research on superstitions and contagion, sweaters are favorite props. APS Fellow Paul Rozin (University of Pennsylvania) and APS Charter Member Carol J. Nemeroff (University of Southern Maine) found that people are reluctant to wear sweaters that have previously been worn by those who have suffered a misfortune, such as an amputation, or by those with a strong moral taint, such as a convicted killer (Rozin & Nemeroff, 1990, 2002). And despite knowing that hepatitis or HIV can't be transmitted merely through bodily contact, people still feel averse to wearing clothes or touching objects that have belonged to people with those diseases (Rozin, Markwith, & Nemeroff, 1992). The law of contagion holds that "once in contact, always in contact" — thus some essence of the previous sweater wearer stays with the garment.

Rozin and Nemeroff point out that such beliefs have an evolutionary psychological rationale. Even if you can't catch a car accident or AIDS by wearing a victim's sweater, invisible germs are the means of contracting many of the diseases that would have afflicted our ancestors. Contagion thus would have been an adaptive heuristic for dealing with sickness before the advent of the germ theory of disease (Rozin & Nemeroff, 2002).

The notion that an object's history magically adheres to it also accounts for the positive value we place on original works of art, objects that have belonged to famous people, and objects of sentimental value. Bruce Hood (University of Bristol) and Paul Bloom (Yale) found that small children already sense that "authentic" objects have a special essence that remains with them and can't be copied. In their study, kids between the ages of three and six were shown a "copying machine" that could make duplicates of objects. Although the participants felt that a "copied" random toy or silver goblet was just as good as its original, they were uninterested in a duplicate of a spoon that had belonged to Queen Elizabeth II, because it wasn't the original. They also would not accept a duplicate of their favorite toy; they would only accept the original, "because it's mine" (Hood & Bloom, 2008, p. 459).

Because It's Mine

Superstitious beliefs have historically been attributed to the lingering influence of childhood understandings about the world (see Rozin & Nemeroff, 1990) and were once considered mainly a problem for neurotics like baseball players and politicians. But using the framework of biases and heuristics pioneered by APS Fellow and Nobel laureate Dan Kahneman (Princeton) and his collaborator, the late Amos Tversky, psychology researchers have shown that superstitious behaviors and thought

processes arise from the rapid, automatic judgments ordinary people routinely use to help navigate a highly uncertain world. Some are even at the heart of some of our most cherished beliefs about the self.

The already-mentioned tendency to be disproportionately fascinated with our own life and priorities is one of these biases. So is the tendency to over-attribute causal efficacy to one's own thoughts. According to Emily Pronin (Princeton) and colleagues at Princeton and Harvard, this tendency helps account for people's superstitious beliefs in their ability to supernaturally influence or cause real-world outcomes (Pronin, Wegner, McCarthy, Rodriguez, 2006).

In an experiment ostensibly having to do with the effects of voodoo curses on physical health, participants stuck pins into a doll representing a research confederate, who thereafter reported a mild headache. In one condition, the confederate arrived late, wore an offensive tee-shirt, and behaved in various irritating ways in order to provoke malevolent thoughts on the part of the participant. Participants in this "evil thoughts" condition subsequently confirmed having negative feelings toward the confederate and, more to the point, were more likely to think that their "voodoo hex" had caused his headache than were those in the control condition (in which the confederate had done nothing to make the participant dislike him). A second study showed something similar in the domain of sports spectatorship. Participants watching a blindfolded confederate attempt to shoot baskets with a toy basketball believed that their own visualizations (either of the shooter making the shot or of the shooter performing an unrelated action) helped the shooter when their visualizations were consistent with the shooters' successes.

These studies demonstrate that sympathetic magic has much to do with *apparent mental causation*, a principle that has been studied extensively by Pronin's coauthor, APS Fellow Daniel M. Wegner (Harvard). Wegner has shown that people infer themselves to be the cause of actions when they have had thoughts consistent with those actions immediately beforehand (and in the absence of other possible causes). In an experiment demonstrating this effect, participants mistakenly thought they had caused a cursor to stop moving on a computer screen if immediately beforehand they had been induced to think about stopping it, even though they did not in fact actually do so (Wegner & Wheatley, 1999).

Apparent mental causation explains more than just voodoo spells or our emotional investment in watching sports. According to Wegner, it is no less than the basis of the human experience of conscious will in a deterministic universe (Wegner, 2002, 2003). He argues that conscious will may be an illusion not unlike a magician's stage trick: We attribute to ourselves authorship of our own actions due to the fact that our self-monitoring thoughts coincide with them, yet the actions themselves actually have other, nonconscious causes. Neuroscientists have provided compelling evidence to support this view. In a famous (and to many, still mind-bending) finding by neurophysiologist Benjamin Libet, motor movements that were experienced by participants as consciously willed were actually shown to be initiated in the brain prior to conscious intention (Libet, 1985).

As we learn more about the brain's inner workings, it may turn out that belief in free will is just a somewhat less foolish-looking version of one of Skinner's gyrating pigeons: a superstitious belief arising from an understandable inference error about how events connect and unfold — a belief that, gratifyingly, puts our own thoughts center stage.

Tempting Fate

The persistence of secret beliefs in the mind's influence over reality is particularly apparent when it comes to questions of luck. Going around casting spells or sticking pins into dolls will make people look at you funny, but no one bats an eye when someone knocks on wood after commenting on their own good fortune. McCain's campaign reportedly resounds with the rapping of knuckles on all available wooden surfaces. And McCain himself, like many people, avoids commenting on his fortunes at all. (At a New Jersey campaign event last winter, he refused to comment on what he would do after winning his party's nomination: "For me to start talking about what would happen after I win the nomination, when I have not won it yet, is in direct violation of my superstitious tenets" [Simon, 2008]). The ancient dramatic principle, "When hubris rises, nemesis falls," remains a widespread, deeply held intuition about fate; it's one that may also be explained in terms of heuristics and biases.

Jane L. Risen (University of Chicago) and APS Fellow Thomas Gilovich (Cornell) recently reported a series of experiments about tempting fate and why it is felt to be bad luck (Risen & Gilovich, 2008). In their first study, participants read a story about a student, "Jon," who had applied to grad school at Stanford. Jon's mother, being constitutionally optimistic, sent him a Stanford tee shirt as a gift even before Jon had heard whether he was accepted. One group of participants read a version of the story in which Jon, also optimistic, wore the tee-shirt after receiving it; the other group read a version in which Jon stuffed the shirt in the bottom of a drawer while awaiting Stanford's decision. As the researchers expected, Jon's acceptance prospects were rated higher if he avoided tempting fate by refusing to wear the tee shirt. In a second study, participants rated the likelihood of a student being randomly called upon in a large lecture class to discuss assigned reading that they either had or had not completed; results showed the same trend: Not doing the reading — again, tempting fate — seemed to make the prospect of being "randomly" called upon more likely.

Risen and Gilovich suggest that a negative outcome following a fate-tempting action will be anticipated by people as especially negative, due to the added embarrassment or regret of having knowingly harmed their prospects, as well as from having gone out on a limb by flaunting a well-known societal norm. They hypothesize that such an outcome becomes more cognitively accessible than its more positive alternative due to the tendency for people's attention to be drawn disproportionately to negative stimuli (a tendency especially found in younger people, such as the college students used in these studies; for a discussion of changes in this tendency with age, see Carstensen & Mikels, 2005). And since ease of thinking about something biases us toward seeing that thing as likely — what Tversky and Kahneman (1973) called the *availability heuristic* — the negative outcome seems disproportionately probable.

In short, people's beliefs about tempting fate are due to their tendency to accentuate the negative coupled with their tendency to believe in the likelihood of what they can readily imagine.

Being of Two Minds

Risen and Gilovich tested their ideas about tempting fate in subsequent studies by measuring participants' response times when rating the appropriateness/inappropriateness of different one-sentence endings to variants of the stories used in the earlier studies. They discovered that Jon's wearing of the tee-shirt, for example, caused negative outcomes to spring to mind more rapidly than other possibilities. They also found that the tendency to interpret events in a story superstitiously was increased when participants were put under the added mental burden of having to count backwards from 564, by threes,

while reading.

The researchers interpret these findings in terms of *dual-process* accounts of cognition. The heuristics and biases giving rise to magical beliefs belong to associative, intuitive thought processes sometimes called “System 1” (Stanovich & West, 2002). System 1 thinking is fast and effortless, rapidly making judgments and associations. It is this system that enables us to react quickly to the ever-changing situations life throws at us. The downside is that its errors can be hard to detect or correct on the fly.

When we are not under time pressure or mental burden, though, System 1 thinking may be tempered or even countered by the slower, deliberative reasoning of “System 2.” This system gives us the capacity to reflect critically on whether leaving one’s umbrella at home really makes it more likely that it will rain, or on whether not doing the reading makes it more likely that we will be called on in class. In the Skinner Box called life, humans, unlike pigeons, can sit back and turn on the System 2 brain: “Well, what if I try *not* bobbing my head once, just to verify that my head-bobbing is what is causing the food to come out that hole?” We can even experiment, altering our head-bobs or speeding them up, or maybe adding in a little twist of the hips and a tap on desk, to see if that modifies the outcome in a favorable way. This ability to reason and reflect critically on apparent associations helps us not veer too far in the direction of mystical folly.

What Do You Have to Lose?

The persistence of superstition in a society that values reason may be explained by how little it seems to matter. It is part of the very definition of a superstition that people will admit they don’t rationally believe that rituals and thoughts have a causal influence; it just makes them feel better to pay their superstitions a certain heed, because what can it hurt? In the mental balance sheet, the trivial cost of seeming slightly irrational is generally outweighed by the size of the possible benefits.

Vyse (1997) notes that, perhaps even for Skinner’s pigeons, there is a certain bet-hedging quality in superstitious behavior, making it reminiscent of Pascal’s famous wager: Even if you doubt the existence of God or heaven and hell, you are better off behaving as if they exist, because you stand to lose in the one case more than you stand to benefit in the other. As Kahneman and Tversky (1979) show in their Nobel Prize-winning work, *loss aversion* is a stronger motivator than the promise of gain.

Pascal’s Wager helps explain why superstitions are such a familiar feature in high-stakes domains like politics, aviation, and sports. In all these realms, there’s a lot to lose. The statistics-obsessed sport of baseball, for example, is also famously superstition-obsessed. Wade Boggs, former NY Yankees third baseman, is a well-known example: He consumed chicken before every game, along with a host of other rituals, to help ensure success (See Vyse, 1997, and the sidebar to the left).

High stakes are often compounded by unpredictability of outcome; in sports, outcomes are (almost by definition) unpredictable and subject to many variables outside an individual athlete’s control. Dutch psychologists Michaela Schippers (Erasmus University, Rotterdam) and APS Fellow Paul A.M. Van Lange (Free University, Amsterdam) have found that superstitious behavior in top athletes positively correlates with the importance of the game and negatively correlates with the degree of control an athlete feels (Schippers & Van Lange, 2005).

Feelings of control are not the same as control, of course. Although eating chicken for good luck may not hurt anybody (except the chicken), superstitious thinking about the way the world works undoubtedly has harmful repercussions. Failing to critically examine superstitious feelings about the contagious qualities of misfortune, for example, can serve to further alienate sufferers from disease and members of stigmatized groups whose conditions cannot be transmitted through contact. Rozin and Nemeroff speculate that fear of AIDS contributed to a decline in people's willingness to *donate* blood, due to "backwards" contagion (Rozin & Nemeroff, 1990). It's no coincidence (and certainly no synchronicity) that the System 1 mind that harbors such irrational fears is also the home of our most harmful racial, class, and gender prejudices.

If You're Feeling Blue...

In a memorable scene from *Casablanca*, Humphrey Bogart's piano-playing sidekick Sam sings "When you are blue, just knock on wood." Whether or not it really works, reducing stress does seem to be the reason people engage in the ritual. In general, magical thinking is known to increase in conditions of stress or danger (see Keinan, 2002), and people with a higher need for control may engage in more superstitious behavior under stress than do their more blasé counterparts.

Tel Aviv University psychologist Giora Keinan (2002) measured the knocks on wood made by participants during interviews that included some questions designed to elicit a feeling of tempting fate, like "Have you ever been involved in a fatal road accident?" Half of the participants were interviewed while under a condition of stress, half an hour before taking a test. All the participants also filled out a questionnaire that assessed their overall desire for control over their environment. Half of the participants knocked on wood at least once during the 11-question interview. Keinan also found that there was a greater difference in number of knocks between the high- and low-stress conditions in participants who felt a greater desire for control.

Even when superstitious beliefs and rituals don't directly influence events or outcomes, they actually do have a causal role in at least one important area of our lives; growing evidence shows that they may reduce our stress, and thus have a real (i.e., causal) relationship to our well-being. Health, of course, is another domain, like politics and sports, in which the stakes are high, outcomes uncertain, and a sense of personal control hard to come by, and stress is increasingly being understood as a central factor in health and illness (see "Understanding the Have-Knots," *Observer*, December 2007). The search for explanations and causes has a stress-regulatory function (Keinan & Sivan, 2001) even when those causes are far-fetched. APS Fellow and Charter Member Shelley Taylor showed that breast cancer patients' search for theories about the causes of their illness, and the illusions of control those theories fostered (however accurate or inaccurate), had a favorable influence on their adjustment. As such, she argued that positive self-deception is a worthy goal of therapy (Taylor, 1983; Taylor & Brown, 1988).

A reasoned, realistic, unsuperstitious view of the self and the world doesn't necessarily lead to happiness; if anything, the opposite may be closer to the truth. Superstitious thinking is fostered by positive affect (King et al., 2007); and depression, conversely, can be described as "a loss of positive illusions" (Vyse, 1997, p. 132). Future research on superstition will need to weigh its offenses against reason against its positively self-deceiving, therapeutic properties. In the end, it may be necessary to distinguish between superstitions that ultimately harm ourselves or others, and those that simply help us bird brains make sense of a senseless universe.

A Sporting Chance

Professional sporting competitions are not only notoriously high-stakes events, but are notoriously unpredictable. No matter how well an athlete performs, the outcome of a game or match is never entirely under his or her control. In the face of this uncertainty, it is not surprising that professional athletes and spectators alike take part in often elaborate superstitious rituals to ward off bad luck and ensure victory. Here are a few of those quirky rituals we've all come to know and love.

Wade Boggs' Ritual Eccentricities: We all know about the pre-game chicken, but Boggs' rituals also included tracing the Hebrew letter *chai* in the dirt before batting, running wind-sprints at precisely 7:17 P.M., and touching the foul line only on his way back to the dugout.

Michael Jordan's Shorts: Throughout his career, Jordan wore his UNC shorts beneath his Bulls uniform for good luck.

Tiger Woods' Red Shirts: Tiger wears only red shirts on Sundays, as his mother believes it is a lucky color for him.

Detroit Octopus Tossing: In 1952, a Red Wings fan tossed an octopus onto the ice to symbolize the eight wins needed to win the Stanley Cup. The Red Wings won eight in a row that year, and flying octopi have been a part of the playoffs in Detroit since 1979. Al Sobotka, the head ice manager, is responsible for cleaning up the creatures. He relished the opportunity to be part of the tradition, often twirling them over his head to excite the crowd. Although the big bad NHL won't let him twirl cephalopods on the ice any longer, the practice continues in the Zamboni entrance, so the Detroit fans can breathe easy.

The World Cup Kiss: During the 1998 World Cup, French footballer Laurent Blanc would kiss goalie Fabian Barthez on his bald head before every game. France won that year.

The Silent No-Hitter: Don't ever talk about a no-hitter during the game. Ever.

And where would sports be without curses?

The Madden Curse: In 2000, the cover of Madden NFL began featuring images of NFL Players. All nine of the players featured since then have been plagued by some injury and six of them missed multiple games as a result, causing their team's record to suffer significantly.

The Curse of the Bambino: After winning 5 World Series Championships in 15 years, the Boston Red Sox sold Babe Ruth to the New York Yankees, supposedly prompting the Bombers to win the most championship titles of any sports franchise in history and causing Boston's 86-year World Series drought. This is possibly the most famous curse in sports, both for how long it stood and for its dramatic breaking in 2004.

The Curse of the Billy Goat: In 1945, Greek immigrant Billy Sianis brought his pet goat with him to Game 4 of the World Series, the last Series the Chicago Cubs have ever played in. After eventually

being ejected from the stadium, Sianis allegedly placed a curse on the team, claiming that the Cubs would never play in another World Series at Wrigley Field. So far he's been right, and according to Sianis' nephew, Sam Sianis, the Cubs may only dispel the curse by demonstrating a genuine affection for goats.