Skepticism 101
Belief in the truth commences with the doubting of all those “truths” we once believed. – Friedrich Nietzsche

It is the mark of an educated mind to be able to entertain a thought without accepting it. – Aristotle

Skepticism is the first step toward truth – Denis Diderot

Learning without thinking is useless. Thinking without learning is dangerous. – Confucius

I mean, you could claim that anything’s real if the only basis for believing in it is that nobody’s proved it doesn’t exist! — J.K. Rowling

Introduction

Psst. Psst. The sound whistled from the mouth of the guy standing in the street in back of his car, rummaging around in the trunk. He wondered if I wanted to buy a brand new Longine watch for $10. He showed it to me; I heard it ticking, tried it on, and said I would take two, one for me, the other for my son. When I got home, I proudly took them out of their boxes and handed one to my son. “Could you believe it? $10 for a Longine watch. These are very expensive watches. You’d pay this amount just for the watch band.” “But, Dad,” my son mumbled, “look closely. It says ‘Longune’ not ‘Longine’ – this is a fake watch.” So I took it the next day to a local jeweler, who opened up the back, and said we’d be lucky if they were worth $5 a piece. I fell for the oldest trick in the book, buying counterfeits from a stranger on a street corner.

And so my father would tell this story about how he got scammed in the early 1960s, before the availability of fake goods made to look real became so ubiquitous. At least the watch signaled its provenance with a misspelled name, even if it went unnoticed by a gullible buyer. And therein lies the story to be told in this collection of short pieces, each illustrating some basic false belief, urban legend, scam, or rumor, and the critical thinking skills needed to skeptically question the veracity of various claims.

The short pieces take a topical claim or event, present the popular narratives about that claim which circulate in mass media and the Internet, and provide counter-arguments and scientific research to refute the false presentations. Ways to think about the issues are illustrated with constructive skepticism and, at times, humorous comments. For this should be a fun journey into the sometimes silly and weird beliefs that circulate in today’s communication channels. At all times, it’s important to remember that skepticism can easily become cynicism and lead to inaction, but constructive skepticism can have beneficial effects and serve as a shield from harm and disappointment.

Perhaps it’s best, then, to start by presenting a sharper case about what skepticism is and how we need to develop constructive critical thinking skills to avoid a slippery fall into cynicism. These important distinctions are made in an October 2011 interview with D. J. Grothe, the President of the James Randi Educational Foundation (JREF), one of the leading organizations focused on promoting “critical thinking by reaching out to the public and media with reliable information about paranormal and supernatural ideas”

Critical Thinker Explains Skepticism vs. Cynicism
**Peter Nardi**: Who is D.J. Grothe and what is the James Randi Educational Foundation?

**D.J. Grothe**: I’m formerly a professional magician, so I have strong interests in deception and self-deception, and in what magicians may have to say about how easy it is to believe nonsense, especially harmful nonsense like psychics and other pseudoscientific and paranormal claims. JREF was created in 1996 by the famous social critic and magician James Randi. He has single-handedly exposed some of the most egregious frauds in our society, like the TV faith healer Peter Popoff and the Israeli magician-turned-fake-psychic Uri Geller, among many others. Inspired by Randi’s work, our foundation provides educational resources to teachers to bring skepticism and critical thinking into classrooms, supports skeptical grassroots campaigns on topics like homeopathy and vaccines, and provides programming about skepticism online, at workshops, and at conferences for the general public.

**PN**: People use the word “skeptical” in everyday talk, but often don’t really use it correctly. How do you define “skepticism”?

**DJG**: To me, the word is best understood by looking at its roots: it comes from the Greek word “skeptikos,” which just means to inquire or to find out. We say that skepticism is the best way of finding out the truth and is precisely the opposite of just saying “no” to others’ beliefs. On the other hand, a knee-jerk rejection of others’ beliefs is more akin to cynicism, not skepticism, and is rather closed-minded.

Skeptics who work with JREF are quite open-minded, but after decades of looking into various claims, we have found no evidence that any of these supernatural, paranormal or pseudoscientific beliefs hold up under scrutiny. In my experience, skeptics are critical thinkers who have a real desire to learn the truth about these sorts of questions.

**PN**: As an educator, I feel that “critical thinking” is something we are in desperate need of developing in our society and educational institutions. What does “critical thinking” mean to you?

**DJG**: Critical thinking is continuous with skepticism – and with science, for that matter. It is simply thinking critically about claims and issues. As an example, think of going car shopping. Smart and savvy people will get a mechanic to take a look at a used car before they buy it, or lift the hood and kick the tires themselves to make sure it is a good deal. So why not also take a very close, skeptical look before buying someone else’s opinion, to make sure that it is worth it and holds up under scrutiny? This is skepticism and critical thinking — believing only those claims for which there is good evidence. Skepticism should be widely applied in one’s life to all the claims heard on a daily basis, not just in one specific area like the paranormal, even though at JREF we focus on paranormal and pseudo-scientific claims.

**PN**: I’m an amateur magician and see how misdirection is a technique used frequently by politicians, the media, advertisers, and many others in everyday life. What role do you see misdirection playing in
today's cultural climate?

DJG: Very important question — I think it is used quite extensively. The magician and the skeptic have a lot of say when they see the “smoke and mirrors” used in politics or the media, especially when it comes to emotional issues like taxes, social welfare and national security. People get distracted from the important issues of the day by being placated by mass culture, as well as being scared by things like terrorism or disasters. This is not to say that things like terrorism are not real threats, but I think these issues are often used by politicians to keep the electorate from focusing on other important issues.

PN: Debunking psychics, scam artists, and urban legends may sound trivial to some people, given the scope of these other social problems in today’s society. How do you respond to these critics?

DJG: Some people think the skeptic's work is trivial, but we think beliefs matter very much. If the majority of people believe in the claimed supernatural ability of a TV preacher to heal their illnesses, there are real-world effects: the believers won't go to real medical doctors. The same is true for belief in homeopathy, or the belief that vaccines are dangerous — there is absolutely no scientific evidence for these harmful beliefs. If military officials believe that the ADE 651, which is nothing more than a glorified dowsing rod, actually detects bombs and then the device is used in theaters of war, it isn’t only that some fraudster gets rich by selling a fake product that enrages us as skeptics, but that real people could die as a result of putting faith in these phony bomb detectors. Skepticism is like a beautiful marriage of consumer protection and science education, and all for the public good.

PN: Often I find that skeptical thinking ends up being about placebo effects, unscientific methodologies, and faulty sampling. So how do you respond to people who say that the traditional scientific method is just one way of seeing the world and a method that may not be suitable to other ways of knowing and understanding reality?

DJG: We hear this a lot. Of course, one doesn’t conduct a scientific experiment to see if he or she is actually in love with a partner, for instance. But the methods and content of science are the best ways of knowing how the world really is. So if someone says, “Throw out the science, I have new truth — but unfortunately it cannot be proven, you’ll just have to take my word for it on faith,” that is a very good reason to be skeptical. And we are even more interested when people say they have demonstrable evidence that their way of knowing or that their supernatural claim is real. If it holds up under scrutiny and proper evaluation, they’ll change the world and win a Nobel Prize. And if it doesn’t hold up, I don’t want people to be hornswoggled into believing harmful nonsense.

Let’s resist being “hornswoggled” by first developing several basic themes and tools of critical thinking that can guide us in developing a constructive criticism so that we can process information with the cognitive complexity many of these issues require.

Consider the following essential elements of critical thinking:
Why Have Women Magicians Vanished?

Working magicians conjure up rationales — both beneficial and baneful — for why so few women perform magic.

In the early 1900s, Adelaide Herrmann was one of the most famous magicians of her day. She inherited her husband Alexander’s magic show upon his death in 1896 and performed internationally for 30 years.

A hundred years later, few people could name her as quickly as they would Houdini, and few can name any contemporary female magicians as famous as David Blaine or David Copperfield.

Research studies show that female membership in magic clubs and performances hovers around 5 percent.

Why there aren’t more women magicians is an intriguing question, especially in an age when women are more likely to participate in comedy, acting, sports and music. What is it about magic that discourages women from an active role and sees them primarily as magicians’ assistants?

Perhaps by looking at this unusual hobby and form of entertainment, we can better understand how gender is performed and how differences continue throughout today’s society. What does magic tell us about the persistence of gender roles in our supposedly more egalitarian era?

Some might argue that women doing magic were historically linked — dangerously — to the practice of witchcraft. Others point to the all-male gatekeepers of the magic clubs and associations, the male-dominated images on magic kits and TV shows, or the problematic entertainment value of watching a woman saw a man in half.

The old gender roles of men as instrumental and women as expressive gains some support when focusing on male magicians with their masculine instruments of power (wands, swords, and saws) and women with their sensitive feminine touch in a palm reading or female intuition in a séance.

Instead of speculating, consider the explanations from magicians themselves. Responding to a survey posted on various magic Web sites and boards (and thus not meant to generalize all magicians), 220 male and seven female amateur and professional magicians answered the question: Why aren’t there more women magicians?

Let’s first look at the answers provided by the seven female magicians:

• As a female magician myself, I believe that males can better identify with famous magicians, most of who are male, and therefore are more apt to develop an interest in magic.
• Because magic at its heart is about power. Men in general have an internal desire to move into chaotic situations with power to bring about order. Is that not in essence what magicians do? Now, I know sometimes the magician causes the chaos in the
first place — cutting the rope, tearing the paper, seeing the lady — but the magician always makes things turn out right. Women, by contrast, usually desire to build strong, intimate relationships with others, and this doesn’t always translate well to magic. Part of the great challenge in being a female magician is not simply to amaze people — which is crazy easy — but to put a deeper meaning into the things we do in order to build that relationship to a level where meaningful ideas can be exchanged.

- Because women have not seen themselves as magicians and have not been encouraged. Women have to invent for themselves ways to do things that men do not. Most magic instruction is designed for men with jackets. Women’s clothes don’t have pockets and women can’t reach into their breast pockets.
- Magic books and magazines gear more for men in their advertising and descriptions of magic. It’s hard for women to find role models that they identify with. Also, women are under intense pressure to stay thin to perform, they are criticized more, where men often do not have the same pressures when performing.
- Like most performing arts, there weren’t many women as a lead performer. It wasn’t socially acceptable for women to be in a “lead” role since they were housewives and mothers of children. To break that mold took a lot of courage. Women were known as the assistants to create a beauty and distraction for the stage magician. So the lesser role was really played by the woman, yet the one with the most responsibility is the woman. It is the assistant who is the real magician.
- Just recently women are starting to appear in more science- and math-related jobs, and the same goes for magic. Men never take women seriously, and it is harder for some women to find mentors. Also women see a magician do a stage act with skinny models dancing around and have a hard time visualizing the woman doing magic with men dancing around her. Large men can’t be box jumpers, so [they] can’t have a male assistant in the box all the time, which adds to the difficulty of a woman performing.
- Why is this question always asked? Yeesh. Sociological, economic, political and biological reasons.

Many of the 220 men (80 percent white, 63 percent college grads, with a mean age of 43) said they often wondered why women weren’t more into performing magic and speculated about a wide range of biological, cultural and historical reasons. In general, these amateur and professional magicians invoke some fairly traditional gender role stereotypes about men and women: Men are into objects, tools and gadgets with which they can demonstrate their control and power; women, on the other hand, are not competitive and are best suited (physically, emotionally) to assisting magicians. While many of the men saw these differences as a function of society reinforcing gender roles and the magic world’s “gentlemen’s club” structure (and discrimination), a few located the reasons in innate biological and psychological traits, including physical size, the ability to keep secrets and even give birth. The often-debated “nature versus nurture” explanations about male and female differences can clearly be heard in these magicians’ voices when trying to make sense of this gender disparity.

To summarizing the key explanations, then, the actual words of the magicians are presented below by combining them into paragraphs organized according to the categories their responses most represent.

**Gadget/Technical**

It’s rare to see women become interested in technology and gadgets to the same extent as men. I suspect the underlying reason is related to why it’s rare to see women interested in magic to the same extent as men. New technology is somehow very magical. Many tricks are one way or another technical, similar to boy’s toys. Magic has a very gimmicky side and guys always love gadgets. It’s the male need to know “how it works” that motivates them toward getting into magic. Pretty much any field that has to do with figuring out how things work has a lack of females (engineering, architecture, science, etc.). Maybe the male mind is more interested in how things work. It interests guys more in general to know how stuff works.

**Power**
Magic suggests power, or a show or display of power. Magic attracts men for the most part because of this power, which is oft associated with men in patriarchal societies. The traditional persona of a magician — magic as a display of power — might not be appealing to many women. Boys begin magic when they are powerless. Boys who seek to become magicians believe that the arcane and esoteric knowledge compromising the secrets of magic will enable them to wield power over others; girls don’t pursue power as a means to influence others. People often first get interested in magic at ages 8-12. It’s usually boys, and they may like having secret knowledge. They may sense performance-magic as a type of power. Men feel more social pressure to be in control. It stems from the initial power trip most young men are on when they first begin the pursuit of magic (“I know something you don’t know”).

**Competitive, Confrontational and Commanding**

Sometimes it just becomes a competition to see who can pee the highest, and generally women don’t want to get involved in that. The initial steps in magic tend to be attempts to prove “I know something you do not.” This is a very confrontational relationship that is more typical of men than women. The “boldness” required to present yourself is, historically, a masculine trait. If the initial steps were more relational, as in “This is what we are doing together,” then I believe magic would be more attractive to women. Women don’t take command of the performing arena the way a man does. Many men can’t handle a strong woman. They are intimidated by strong women. Men’s egos typically won’t allow themselves to be upstaged by a woman. The classic image of a conjurer in the past century was a dominant, commanding figure, which is at odds with our Western idea of the feminine role. Magic, for the most part, is presented like a puzzle or a challenge to an audience by most practitioners. Women present magic more as an art form.

**Hobby for Geeks**

It’s the boys-and-their-toys syndrome. Magic is often considered a childish phase and fixation, which is more acceptable for men to have than it is for women. Magic may also suffer from the Star Trek syndrome: lots of uncool, nerdy geeks involved. Women tend to shun anything that is even remotely “unhip” or just not cool. Magic has a stigma of being geeky. Men are more likely to be socially inept and require a shield to hide behind for attention and social interactions. Insecure males get into magic as a way to make up for their social inadequacies. It is very much like being a computer geek, there is a lot of alone time and practicing.

**Traditional Gender Roles**

It’s about stereotyping and social acceptability. Parents give magic sets to little boys and dolls to little girls. The classic image of a magician is male, so more males are drawn to it as an acceptable hobby, and the next generation sees mostly male magicians and thinks it a pursuit for males, so the pattern perpetuates itself. There are not many female role models in magic. The “good old boys” kind of lock women out of the loop. There is plenty of “boys club” attitude among magicians. Women magicians aren’t encouraged or mentored. Women are not encouraged to find self-validation in nontraditional means. Young women are still very rarely encouraged to focus on anything that is not “wife,” “mother,” and now, maybe “career.” Society still places women at home. Even those with careers still do the majority of chores at home. Also, differences in social acceptance of keeping secrets may be a factor for magic. Men tend not to believe they have deceived a friend by keeping a secret (not restricted to magic) while females relate it to trust. Males accept keeping secrets such as customer base, market information, etc., as just another day at the office. Women “share” and aren’t generally the best at keeping secrets.

**The Nature of Magic**

Historically, women have been persecuted for participating in magic and women who practiced magic were historically identified with witchcraft. Perhaps people expect males to be wizards/magicians and women to be witches. Not many women want to be associated with the negative image of witches. Magic has always been presented as something of a fraternity, and for
the longest time, magic clubs did not allow women to join (following the trend of most private clubs of the era). The traditional role of a male magician and his female “assistants” is not a social role that is easily transposed into female magician and her male “assistants.” This makes the road to being a successful female magician even harder since they have to create a whole new paradigm of what it is to be a magician in order to succeed. What females do when they are magicians is a more subtle type of magic whereas men do the sword through/cut ‘em up/more sadistic type of thing. Because women are smaller, they are better suited as the subjects for levitations and other illusions where close confinement is required. A woman’s hands are usually smaller than a man’s and therefore less suited for concealing cards and other large objects. It also seems to be more difficult to adapt women’s clothing with pockets for concealment of birds and other objects used in magic.

Biology

Brains are wired differently for men and women. Most of contemporary magic is presented as an analytical challenge/puzzle. This is analogue to the left part of the brain, which is the “male” part. Women are more right brain oriented and respond better to the emotional, lyrical and mythical. There are different interests between women and men, mainly due to a difference in their brains. This does not mean that women are inferior to men, just that they are different. Women are less solitary, on the whole, and more social, so magic does not appeal to them as a career because to become a successful magician requires a lot of solitary work. They are also truly magical mystical creatures: Women can deceive you without gimmicks. They are magical in and of themselves. The ability to create life from seemingly nothing is all a woman needs. They can perform the greatest miracle of all — giving birth to a live person. Woman can command men with that power. Men must resort to trickery to suggest such power residing in themselves.

Looking at the increased number of women in other traditionally all-male occupations, such as medicine or law, obscures how many still view gender differences in areas characterized by issues of power and control. Perhaps only when magic’s gender imbalance changes can we declare that discrimination based on sex has truly vanished.

Storks, Vaccines and Causation

The apparent connection between vaccines and autism didn’t reveal much about medical safety but did reveal lots about thinking.

Before learning about the “birds and the bees” we may have been told how the stork brought us, as a little baby, to our parents. Even with a minimal interest in the animal kingdom of storks, birds and bees, we likely started to question this curious story. That is until we heard this news about Denmark: Post-1960 there was a significant decline in the number of nesting storks in Denmark. Also, beginning in the late 1960s, Denmark started recording its lowest average number of childbirths per woman. In short: fewer storks = fewer babies.

Here rests one of the fundamental errors in debates, research and uncritical thinking: confusing correlation with causation. So powerful are spurious relationships that they can sometimes have significant public policy implications. Consider the story of autism and vaccines.

In 1998, The Lancet, a respected medical journal, published Dr. Andrew Wakefield’s research claiming a link between autism and the MMR (measles, mumps, rubella) vaccine. Ever since, people in the autism community have raised concerns about live-
virus vaccines and their children’s health. Fueled by the popular media, in particular the Internet, Dr. Wakefield’s research has resulted in a decline in vaccinations and, some say, a resulting increase in childhood diseases like measles.

However, on Jan. 28, Britain’s General Medical Council concluded that Dr. Wakefield acted dishonestly, unethically and irresponsibly when carrying out his research. And on Feb. 2, The Lancet said “we fully retract this paper from the published record.”

Although it’s reasonable to have some concerns about the many ingredients that go into vaccines and other medications, it’s still important to look more closely at the specific issues raised by the MMR vaccine and autism research, and use our critical-thinking skills in understanding what is going on. When assessing research, it’s important to evaluate several elements: the sample, the quality of the data collection process (such as survey item wording or interview style), and how the data are analyzed (appropriate statistics and charts).

Let’s begin with the sample: The original Wakefield study took blood samples from only 12 English children who were attending his son’s birthday party. They were each paid the equivalent of around $8. Already, we begin to question the quality of the research when such a small sample is used. It’s also important at this point to consider any ethical questions about paying the children studied and how they may have been affected by having invasive blood samples taken.

For research to carry any weight, replication is essential, and studies with larger and better samples have not demonstrated a correlation between vaccines and autism.

Furthermore, before cause and effect can actually be declared from a correlation, a timeline must demonstrate that the cause came before the effect. For example, students who study more tend to have higher grades. But does studying lead to higher grades, or do those students who have higher grades (maybe who are smarter to begin with) tend to study more to ensure continuation of a high GPA?

When reviewing how researchers collected the data, assessing which data occurred when is important. In many cases, it turns out that autism appeared before the vaccinations were administered.

In analyzing the data collected, in order to claim a cause and effect, review how the research eliminated alternative explanations. Do changes in industrialization and urbanization in Denmark, for example, connect to a decline in the stork population as well as to changes in family life and fertility? Spurious correlations are easily addressed by searching for a third explanation. The appearance of autism tends to occur between the ages of 2 and 5, the same period when vaccines are administered.

Just because there is a societal increase in autism rates coinciding with an increase in the distribution of the MMR vaccine, it does not indicate a cause and effect relationship, especially if autism rates continued after thimerosal (the mercury-based preservative hypothesized to be at fault) was removed from the vaccine.

Increases in autism rates could be due to other explanations such as changing definitions of autism and better diagnosing techniques, thus illustrating how other variables can create the illusion of a correlation between immunizations and autism. Other studies also indicate that boys are about four times as likely to have autism despite similar rates of vaccination.

Finally, a major study in 2002 of almost half a million Danish children found no difference in immunization records between those children with and without autism. To date, there is no scientific evidence in the published literature of a causal connection between immunization vaccines and autism. And thanks to Denmark we have the research on this spurious relationship between autism and the MMR vaccine — and, of course, on storks and childbirth.

Nelson Mandela’s Penalty Kick
As the globe catches World Cup fever, our Peter Nardi sees a little hidden scamming among the confetti.

Yesterday I noticed an e-mail in my inbox from the Nelson Mandela Foundation. Unlike many other e-mails whose subject matter contains various innovative ways of spelling Viagra, this one seemed at first glance to be a legitimate organization’s communication.

I read the following message:

“Your email address has been selected as one of the winners of the Nelson Mandela Foundation/Fifa 2010 World Cup Lottery Draw. Kindly review the attached letter for instructions on how you will claim your prize.

Thanks.”

The reply email address was listed as: NELSON MANDELA FOUNDATION (with an e-mail address of nmf.nmf2.192@msn.com) and a Word document eagerly awaited a click from my mouse.

Yesterday was also the day I wasn’t born. I immediately searched on the Internet and, of course, found the real Nelson Mandela Foundation’s Web page with a warning about this scam, which has been circulating since the beginning of 2009. It also reproduced the instruction letter that informed me that my “Email Address was among the 2010 Email Addresses that was picked through the computer ballot system.” (To view a copy, see PDF here)

And “with great pleasure” the “Staffs & Members of the Lottery Board Commission” congratulated me on having my e-mail address “come out top number (1) out of the 2010 Email Addresses, on the FINAL BALLOT DRAW, and this had made you the JACKPOT WINNER OF THE SUM OF US$ 850,000.00.” Standard Bank LTD was listed as a sponsor of the promotional program.

Obviously, e-mail veterans know immediately that this message is likely a scam, perhaps a creative variation of the formerly ubiquitous Nigerian bank scams. But let’s look more critically at the elements in the e-mail and attached letter to help us in discovering its false nature.

First, check to see to whom an e-mail is addressed. In this case, it was sent to a group distribution list and not to me individually. Could it be that all 70 people on this list “came out top number (1)” in the computer lottery? Even if I were the only person addressed, I should still first ask how I could be part of a lottery I never entered.

No names were in the body of the e-mail, neither a “Dear _____” or a “Sincerely, _____” and the attached letter generically was addressed “Dear Winner.” I would think that if almost a million dollars were being handed out to me, I should have the courtesy of at least a personalized letter.

Since so many scams originate in non-English-speaking countries, sure signs of fraud are grammatical and spelling mistakes, that is, beyond what seems to be the norm among texting teens! These mistakes can range from fairly overt errors to more nuanced idiomatic misuses.

A small example is the future tense phrase pointing to the attached letter as providing instructions “for how you will claim your prize” rather than the more common present tense phrasing “for how to claim your prize.” The letter also contains a mismatched noun-verb with “your Email Address was among the 2010 Email Addresses that was [sic] picked.” And this sentence in capital letters makes little grammatical sense with its plural form of “information” and other poor phrasing: “THE WINNING INFORMATIONS WRITTEN ABOVE ARE THE ORIGINAL WINNING INFORMATIONS AS WAS SELECTED BY THE COMPUTER ON 7TH DAY OF JANUARY 2009 AND IT HAS ALSO BEEN AGREED THAT THE WINNER WHOSE WINNING INFORMATIONS HAS BEEN SENT TO, WILL BE PAID THE SUM OF US$ 850,000.00.”

Finally, the secretive nature of the lottery, as stated in yet another oddly worded sentence, seems peculiar given that it’s supposedly a promotional program for the World Cup and publicity would be a major component of the campaign: “Please keep this Form confidential from public to avoid double claim and contradiction over the receiving of your fund.”
Beyond an internal check of the elements in an e-mail message and letter, another step to critically assess the offer is to go to the source: Check out the Nelson Mandela Foundation, in this case an actual organization. On the Web page, it’s easy to find a warning about the e-mail scam and to learn that it does not sponsor lotteries. Searching for the Nelson Mandela Foundation Lottery similarly turns up many Web sites and other references debunking lottery scams and warning people not to follow through with the instructions in the letter (and reminding us not to open an e-mail attachment from someone we don’t know). These critical-thinking steps do not take much effort, yet many people often hurriedly react to these messages and bypass logical reasoning. Should you recklessly engage the senders of these scam e-mails, be sure to contact the Internet Crime Complaint Center, which is co-sponsored by the Federal Bureau of Investigation and the National White Collar Crime Center. And next time, don’t take a chance on an e-mail offering something for nothing; your odds of winning in a real lottery are certainly better — and you know how unlikely it is to win a lottery!

**Questioning Questions in Evaluating Polls**

How you ask, what you ask and when you ask can all affect what you get in conducting polls.

Recently a conservative organization’s solicitation letter (aka junk mail) arrived in my mailbox pleading for funds to “clean up television.” I strongly agree that there’s much on TV that I would like to see changed, but my list would primarily be to eliminate stupid reality shows and idiotic cable news commentators interrupting each other in shouting matches. This letter had something else in mind. Attached to the donation card was an “official poll” asking several questions including: “Are you in favor of television programs which major in gratuitous violence such as murder, rape, beatings, etc.?” and “Do you favor the showing of obnoxious and edited R-rated movies on network television?”

I don’t think that the folks who would say “yes” to gratuitous murder (are other kinds of murder OK, then?) or favor obnoxious movies on TV are really the target group for the donation. And I also don’t believe they were trying to recruit film buffs who abhor the editing of movies by anyone other than the film director. The solicitation “survey” leads recipients to check “no” for the answers, but to say “yes” to sending a check to correct these media problems.

What you see here is a technique that orients and biases questions in specific directions through the use of loaded words and leading phrases. Learning to critically evaluate surveys and public opinion poll questions are important skeptical skills to use when faced with a daily dose of possibly deceptive data, even from professional surveys trying to present honest results.

Let’s look at a couple of real examples from some official surveys. The Pew Research Center for the People & the Press is a well-respected national nonpartisan public opinion research organization focused on policy issues and the media. They have done extensive work on designing surveys and illustrate the impact wording can have on responses.

One example is from their own January 2003 survey asking respondents whether they would “favor or oppose taking military action in Iraq to end Saddam Hussein’s rule.” When worded that way, 68 percent said they favored military action and 25 percent said they opposed it. However, when the question was written as: “favor or oppose taking military action in Iraq to end Saddam Hussein’s rule even if it meant that U.S. forces might suffer thousands of casualties,” a major reversal of opinion occurred. Only 43 percent said they favored military action and 48 percent said they opposed it.

Consider also these curious findings from a February 2010 CBS News/New York Times poll. When people were asked if they “favored or opposed gay men and lesbians serving in the military,” 51 percent responded “strongly favor” and 19 percent “somewhat favor,” for a total of 70 percent approval. Yet, when the wording was changed to “favored or opposed homosexuals serving in the military,” 34 percent answered “strongly favor” and 25 percent “somewhat favor,” for a 59 percent approval rate.
Although a majority of Americans were supportive regardless of the wording, note how using “gays and lesbians” instead of “homosexual” created a more positive outcome. Perhaps the H-word highlights the sexual too much for many people’s comfort.

Another less obvious technique for leading respondents toward intended answers makes creative use of the order of poll questions. If one were to ask residents, for example, about their opinion of the effectiveness of the local mayor after first inquiring about their views on several problems facing the city (such as budget problems, potholes in the streets, crime), a different outcome would likely occur compared to asking them how their mayor is doing right at the start of the survey.

Such an explanation is what Nate Silver believes accounts for the major discrepancies between Fox News polls and other non-Fox surveys focused on the health care reform bill.

For a reasonably-worded question, “Based on what you know about the health care reform legislation being considered right now, do you favor or oppose the plan?”, 53 percent of those interviewed stated they were opposed to the plan. On average, Fox’s numbers across several surveys showed a 14 percentage point difference between those who favored the legislation versus those who opposed it, compared with only a 2 percent difference in non-Fox polls. One reason may be due to the placement of the health care items after a set of questions that included: “Do you think President Obama apologizes too much to the rest of the world for past U.S. policies?” and “Do you think the size of the national debt is so large it is hurting the future of the country?”

This is a wonderful case of a properly worded question on the health care plan following a set of leading and loaded questions that likely created a negative context to President Obama’s policies. When the findings were announced, no mention was made of these other items and the placement of the health care item after them.

So in addition to assessing the phrasing of survey items, investigate the context in which questions appear. I’m sure you agree with me on the importance of questioning questionnaire design and its impact on survey results. Select one: a) Strongly Agree or b) Somewhat Agree.

**Logically Absurd and Contradictory**

In honing your home logic skills, try reducing any argument to its basic premise at the extremes of its subject.

Once upon a time, I checked my horoscope just for fun. It simply said: Scorpios are skeptical about horoscopes. Wow! What more could a critical thinker want to read?

Don’t get me wrong. It’s true I am quite skeptical about horoscopes, so by admitting to this, I prove the horoscope true — but then I simultaneously contradict my skepticism. This circular reasoning illustrates the importance of developing arguments that are inherently noncontradictory and that cannot be demonstrated false when carried out to extreme examples.

This simple statement captures the essence of one of the basic tenets of thought: Aristotle’s law of noncontradiction and the absurdity of reducing something to its logical extreme. The law states that something cannot be true and not true at the same time; that would be absurd. It allows a person to ask how meaningful would someone’s position on an issue be if it were taken to its logical extreme.

Yet, making a “reduction to the absurd” (reductio ad absurdum) argument can be an effective technique when refuting pseudo-scientific statements and one to consider adding to your repertoire of critical-thinking tools.

Consider the use of this method by mathematician John Allen Paulos, author of Innumeracy. In a Dec.13, 2009, New York Times Magazine article, he discussed the angered responses to a scientific panel’s controversial advice that healthy women in their 40s avoid routine mammograms until their 50s. Paulos argued that the public’s reactions derived from an intuition that
earlier screenings improve detection of a deadly cancer. However, he said that if this belief were true, then why not screen asymptomatic women in their 30s or, for that matter, beginning at 15? The panel’s recommendations focused on the increased risk from cumulative radiation over many years outweighing the detection of cancer. Paulos demonstrates the use of the reductio ad absurdum technique to refute the common intuitive reaction in favor of the panel’s more scientific findings. Whatever is true about one statement should then be true of similar statements based on the same premise, even when taken to the absurd limit.

If it’s accurate that earlier screening is better, then even earlier testing would be best. If not, then there is something logically incorrect about the initial statement that earlier is better. It is a proof by contradiction.

So how can these techniques and principles of logical thought be useful for developing strong critical-thinking abilities? Consider the following: Increasing taxes to allow all Americans to have health care will benefit the economy in the long run. However, let’s take this to a logical extreme: Raising taxes to 100 percent of income should then bring about the best health care and a stronger economy. But devoting all of one’s income to pay taxes would result in a failure to meet other obligations and purchase other goods, thereby bringing doom to the national economy and the health care system. Increasing taxes beyond a certain point contradicts the initial premise of better health care and a stronger economy result from raising taxes. The policy trick is to figure out what that certain point is and achieve a balance between necessary taxation and economic benefit.

If two statements contradict each other, they cannot both be true. Another example is the argument made by opponents to same-sex marriage who feel that legalizing it would harm the institution of marriage. Carrying this statement to the absurd, James Dobson of Focus on the Family predicted in 2004 (months after Massachusetts courts made these marriages legal) that same-sex marriage “will destroy marriage. It will destroy the Earth.”

The law of noncontradiction would have us believe that a state with legalized same-sex marriage would exhibit an increase in the dissolution of different-sex marriages and divorces, since the opposite (no impact or a strengthening of marriage and, I suppose, a continuation of the Earth as we know it) could not also be true. In 2008, after four years of data, Massachusetts’s divorce rate for different-sex marriages declined from the previous year to the lowest level in the country. It was the lowest rate since 1940.

When hearing competing positions held by politicians about health care, for example, or solutions to our economic recovery, take their statements to logical extremes and uncover any potential contradictions. Engaging in a reductio ad absurdum technique and invoking the law of noncontradiction will assist you in critically thinking about people’s arguments on current issues and in dealing with rumors that float around controversial policy plans. And of course actual data often provide some much-needed assistance in the heat of a discussion.

Believe me because Scorpios tell the truth. It’s only this sentence you are now reading that is not true. But that’s another paradox for another column.

Pyramid Power, or Pennies for a Pony

Whether chain letters or Bernie Madoff, scams that rely on ever-greater numbers of gullible people eventually founder.

When I was a kid, I read somewhere that if I put a penny in my piggy bank on day one and doubled it each day, by the end of the month I’d be a millionaire.

Wonderful, I thought. I only needed to take 127 pennies from my weekly allowance in the first week; not too bad a burden when there were only three more weeks to go before I could afford a pony for my sister’s birthday! Of course, with some
better math skills and skeptical thinking, it dawned on me that on day 26 I would have to put over $335,000 in the bank to reach a million the very next day, a little more than I would collect in tips on my newspaper route.

This was also my introduction to the ancient pyramids of Ponzi.

Thanks to Bernie Madoff, who was sentenced to prison just over a year ago, we’ve all heard about the Ponzi pyramid scheme that depended on new investors paying the earnings for earlier investors’ supposedly surefire moneymaking ventures.

Named after the Italian immigrant Charles Ponzi, who bilked millions from people buying his international postal coupons that he sold from his Boston office in the 1920s, these swindles depended on the trust and avarice of many, increasing at an exponential rate similar to my piggy bank scheme. Although attributed to Ponzi, this investment strategy can be traced to William F. Miller, a Brooklyn bookkeeper and Bible studies teacher, who in 1899 promised investors a return of 10 percent a week, or 520 percent a year. But Miller himself was swindled and then caught when he couldn’t make the promised payments to his clients.

Lest you think these schemes existed only for the past century or so, consider the phrase “to rob Peter to pay Paul.” This idiom refers to taking money from one person to pay a debt owed to another. The *Oxford English Dictionary* traces the phrase to John Wycliffe’s *Select English Works* of 1380, in which the theologian writes, “Lord, how should God approve that you rob Peter and give this robbery to Paul in the name of Christ?” The concept of swindling money from some people to pay off the debts and supposed investment earnings of others probably existed even earlier, perhaps to the era of the first pyramids.

And lest you think that you are not one to fall for such financial schemes, consider the e-mail chain letters that fill many inboxes: Send this on to 10 good friends and wait for good luck to happen; failure to pass it along can only bring sorrow and bad karma. Or so we are led to believe. These harmless messages do create lots of spam and annoy your friends and colleagues, perhaps creating bad karma for those who forward them.

But how often do you feel a wee bit on alert when you choose not to send these chain e-mails on to others? Just maybe something might happen; after all, testimonials from allegedly real people who’ve had bad luck after they failed to pass along the chain letter are provided.

So let’s put on the critical thinking hats and detect what’s happening in these schemes. First of all, chain letters that require sending money or something of value are against federal postal law.

E-mail versions, which emphasize bringing luck or blessings from the Lord, are not illegal, but have similar characteristics. Invariably, the stories urge you to act quickly. They provide minimal details and vague generalizations about the good fortune of those diligent folks who forwarded the e-mail to friends and about the harm that came to those who didn’t. Sally sent out the e-mails to her friends and within days she met a boyfriend and they eventually married; Roberto ignored his e-mail request to forward it and several weeks later, while crossing the street, he was hit by an out-of-control semi. Dates and locations are never specified, and the statutes of limitations for how long the curse or luck last are never specified. Correlation here always implies causation.

Financial pyramid schemes consistently build on the idea of something for nothing: huge returns in a short time period for doing virtually no work. Often a secret plan or international connection is invoked, and evidence of the underlying product or investment is difficult to find.

Given the ultimately exponential number of people needed to pay off the earlier investors, pyramid plans run out of people, usually exceeding the population of the U.S. (or Albania) within a dozen levels.

You should also investigate multilevel marketing plans that involve paying you commissions for selling a product and for recruiting new distributors of the product. Some of these programs require that you buy starter kits of literature and inventory while promising you quick fortunes for selling their magical diet elixirs. For legitimate multilevel marketing companies, be
sure to research their plans’ details, their track records and the legitimacy of the claims made about their products. Perhaps then you’ll have a piggy bank with more than just pennies and legitimately get to buy your pony.

Moral Panics and Rumors
When the world turns its mean side to the public, rumors amplified in the Internet/cable news age often slip past our critical thinking skills.

“Lions and tigers and bears! Oh, my!” It’s a dangerous world out there today. Scams, rumors and urban legends proliferate and seem uniquely linked to our media-dominated, Internetted, socially networked societies.

Yet if we look at the pre-electronic 17th-century witch scares of Salem, we see that history has regularly been filled with the failure of critical skills to address fantastical rumors, suppress fear and redress pseudo-scientific claims.

Central to many of these irrational outbreaks, both historically and today, is the powerful concept of “moral panics.” First used in 1971 by British sociologist Jock Young and more widely popularized by Stanley Cohen in his 1972 book Folk Devils and Moral Panics, moral panics are perceived threats to a society’s values presented in a stereotyped way by the media. Experts are dragged out to provide solutions in response to politicians’ and moral leaders’ outrage at alleged evil transgressions.

The responses are often disproportionate to the seriousness of the event. Remember the panic among understandably frightened parents that followed the tragic deaths at Columbine High School in 1999?

Within hours, 24-hour cable news shows found numerous teachers, preachers and political leaders offering pithy sociological, economic and psychological speculations about the causes of shooting massacres among today’s youth. The underlying tone was often moralistic, readily pointing out the decline in our core values. The news event initially stressed the moral decay of contemporary society but eventually did lead to a deeper focus on issues of bullying in schools.

Certainly this shooting was a serious concern for parents everywhere. It’s clear why it received so much media attention: Sensational events are by definition rare, because most of the time kids go to school and return safely. That’s not newsworthy. Was the outcry proportionate, then, to the incident? After all, each day many more young people die from gang shootings, traffic accidents or poor health care than from school rampages — without similar widespread media coverage and moral outrage.

Consider too the media’s obsession when a child is missing or abducted. Rumors abound and the fear of stranger abduction becomes disproportionate to the actuality. Most missing kids are runaways or kidnapped by a relative. With the predictable set of experts, the news shows focus endlessly on these missing child stories (and more likely when they are white, middle class and female). It’s understandable why the emotional story gets told. But critical thinking seems to disappear in the frenzy and gets lost in the moral outrage. Rarely are we presented with findings from research and balanced coverage.

A substantial amount of incorrect data and exaggerated media coverage proceeds with alacrity nowadays, thanks to the Internet and instantaneous Twitter feeds. The creation and spread of rumors and misinformation, especially in the context of a moral panic, is a well-known social process. Long a focus of study by psychologists and sociologists, rumors tend to proliferate in times of ambiguity and a lack of information. People (like TV pundits) often construct explanations to fill in missing information and offer speculative causes. Fueled by anxiety, these rumors take on a life of their own. Think back on the many stories that followed the events of 9/11 when there was a high degree of ambiguity and anxiety.

Some rumors of course may be playful like the Beatles’ “Paul is Dead” meme in 1969. Many rumors can be destructive when used to ruin the business competition or when interfering with important social and political initiatives.
According to a classic 1947 study by Gordon Allport and Leo Joseph Postman, as rumors get passed along, similar to the “telephone game” you played as a child, some details get eliminated (“leveled”), other information becomes highlighted (“sharpened”), all the while filtered (“assimilated”) through the participants’ selective personalities, biases and situations. Rumors are a truly social process because they require interaction with others, even if mediated by electronic transmission. Yet that may be a problem today: We don’t know for sure who is spreading the questionable news and writing the blogs, or what makes the experts on cable news so expert. The first step then in dealing with rumors and moral panics requires assessing the credentials and biases of those disseminating the information, as best we can. Or as I often do when I hear about another folktale or rumor, I assess its veracity using such websites as Snopes.com or FactCheck.org, both of which helped to quell some of the rumors and misinformation during the 2008 U.S. presidential election.

What is important for critical thinkers, however, is to understand the dynamics at work when moral panics generate rumors, whether about Satanic child abuse in schools (as in the infamous McMartin Preschool hysteria in the 1980s) or about the birthplace and religion of President Barack Obama. It’s an age-old social interaction of sharing unsubstantiated news with others, in part to account for missing or ambiguous information and to address some moral or social anxiety.

A rumor by definition is information yet to be proven true or false; it often ends with confirming or disproving facts. Occasionally, though, there are actual lions, tigers and bears out there. And it’s then that we need to have credible data from reliable sources to solve those real social problems.

Sample This: Making Sense of Surveys

There are a lot of shoddy polls out there. Some are frank about their shortcomings and some aren’t. Here are some ideas for getting an accurate picture of what a poll can tell you.

“But mom, everyone is going. Why can’t I?”

The anxious parent typically responds with numerous reasons why going to the big party is not going to happen, especially since it’s at a friend’s house while the parents are out of town. Yet, it’s the critical-thinking parent who might instead reply: “Everyone? Did you collect data to support your position? Let’s see your sampling methodology.”

OK, not all skeptical parents will pose such a geeky response, but I’m sure they know that not every teen is going to the bash. Making generalized claims based on limited samples of people is a major problem, and not only in parent-child relationships. Indeed, learning to evaluate the quality of public opinion polls, scientific research and proclamations by politicians and pundits involves understanding some basic principles of random sampling. It’s an especially important lesson in the U.S. today as Americans prepare for midterm elections.

Many times we make decisions about everyday issues based on a non-scientific survey of friends. Think about how you get recommendations for movies, restaurants or travel tips. You ask people you know, or maybe even depend on a Zagat guide or a website like TripAdvisor. None of these are in any way more representative of opinions than the “polls” on various news websites that have hundreds of thousands of voters. CNN even reminds you, “This is not a scientific poll” when you click on the results to its daily “Quick Vote.”

Asking a few people’s opinions is a reasonable process when deciding whether to forage for the perfect pizza, but not a method you should use exclusively if you had to make some life-or-death decisions about health issues or public policy. As we enter the election season, we ask how can political polls like Gallup be so accurate when surveying about 2,000 people? The answer can be traced back to an infamous event when the Literary Digest announced that Republican
candidate Alf Landon would win the 1936 presidential election against Democrat Franklin Roosevelt in a landslide. The magazine’s claim was based on around 2.3 million people responding out of 10 million receiving a ballot. Roosevelt won that election (and two more after it); the *Literary Digest* was out of business by 1938.

Explanations include that the magazine used car registration lists and phone books to construct the sample, *biasing the results* toward the better off; that fewer than 25 percent of those receiving ballots responded; and that nonresponse bias occurred — those who did not return their ballots were *more likely to be Roosevelt supporters*. Pollsters today also make a distinction between the general adult population, registered voters and likely voters when conducting election surveys, something the *Literary Digest* did not do. Larger sample sizes do not, on their own, guarantee accurate results.

When the original population from which a subset of respondents is drawn is not clearly defined and not representative of its diversity, samples are unlikely to be good predictors of opinion or behavior. Statisticians have developed random probability techniques to insure that samples are representative of the population and can reasonably conclude that polling 2,000 people will result in findings accurate within, say, plus or minus 4 percent.

Sure, now that we’re dealing with genuinely representative samples, *doubling the sample size* to 4,000 will be more accurate, but is reducing the estimated outcome to 2 percent error worth the added *costs and time to survey* that many more people? There will always be some margin of error, but just as Gallup found in its presidential polls, the results are pretty close to how the population actually voted, thanks to these random sampling techniques.

When interpreting findings from polls and research studies, assess whether the data are based on at least a representative sample and preferably a random sample in which each person had an equal chance of being selected.

Sometimes it’s difficult to tell: *The New York Times* printed a correction in 2006 when it included data from an American Medical Association report on binge drinking, stated to be based on a random sample of 644 college women on spring break. The *Times* later concluded: “The sample, it turned out, was not random. It included only women who volunteered to answer questions — and only a quarter of them had actually ever taken a spring break trip. They hardly constituted a reliable cross section, and there is no way to calculate a margin of sampling error for such a ‘sample.’”

Also use your critical skills and constructive skepticism in evaluating sampling in everyday situations. For example, when facing an advertisement bragging about a survey that showed how loved a particular movie is, determine which people leaving the theater were surveyed. You should conclude that the results apply only to those respondents; you cannot know what the people who left the theater right away or in the middle of the movie think about it. These surveys typically depend on convenience sampling with the risk of *Literary Digest* nonresponse bias.

Like the mountebanks of old pushing their wondrous elixirs, and today’s charlatans with their magical diet techniques, testimonials ads and anecdotes of a few end up substituting for the scientific sampling of the many. Obviously, it’s not practical to generate a random sample each time you need to find a great hotel or restaurant; just be careful in interpreting all those website opinions. Then maybe you can skeptically ask a friend whose tastes are similar to your own impeccable ones about where to eat or what party to attend. Or if their kids are attending that awesome party.

**Halloween Horrors and Common Sense**

**Mythology aside, not everyone who listened to that famous ‘War of the Worlds’ radio broadcast went bonkers.**

On October 30, 1938, a now infamous radio show put listeners’ skeptical skills to the test. According to a news bulletin that interrupted the supposed sounds of the Ramón Raquello orchestra live from the Meridian Room of the Park Plaza Hotel,
Martians had landed in New Jersey and were running amok destroying everything in sight. No, it wasn’t the Jersey Shore kids, but a play based on H.G. Wells’ *War of the Worlds*. This Orson Welles’ version resulted in panic throughout the country, or as *The New York Times* reported on Halloween day: “A wave of mass hysteria seized thousands of radio listeners between 8:15 and 9:30 o’clock last night.” Boo, indeed!

Hadley Cantril in his classic 1940 study of the psychology of panic, *The Invasion from Mars,* estimated that at least 6 million people, possibly as many as 12 million, tuned in to the show at some point that October evening. Of those, approximately 1.7 million listeners thought it was a real news show and 1.2 million of them panicked to some degree — a lot, but not even close to a majority. While demonstrating the power of specific social and psychological factors contributing to the panic, Cantril’s research clearly pointed out the important role of critical-thinking abilities in determining whether the show was a play or a live news event.

Studies demonstrated that one of the primary reasons for misunderstanding the show was tuning in late. Many had been listening to the rival top-rated show, Edgar Bergen and Charlie McCarthy (yeah, a ventriloquist on radio!), and when they switched stations, most missed the opening disclaimer that this was a fictional play of H.G. Wells’ classic sci-fi novel. But not all the late-comers were fooled. Many using critical skills analyzed internal evidence and decided the event was not real. For example, they recognized Orson Welles’ distinctive voice, or figured that there was no way reporters could drive from New York City to distant parts of New Jersey within minutes of the first sightings to give a live on-the-air update. Others checked the newspaper to see it listed in the “radio guide” for that evening, turned to other stations and noticed it was not news there, or simply looked out the window to see whether there were fires and crowds of people streaming away from attacking Martians.

Yet, the power of selective perception runs wild. As reported in Cantril’s study, people who panicked tended to have personalities more prone to suggestion and susceptibility; they were often gullible and phobic worriers, religious and lower in self-confidence; and they tended to be less educated with lower critical abilities.

For example, when determining whether the show was real by turning to another radio station, the panickers claimed to hear religious music: “I was sure a lot of people were worshiping God while waiting for their death.” Or, upon hearing music said, “Nero fiddled while Rome burned.” Others who looked out the window even had selective sensory responses: “thought I could smell the gas. And it felt as though it was getting hot, like fire was coming.” But most tellingly is this response from a frightened listener: “I knew it was some Germans trying to gas all of us. When the announcer kept calling them people from Mars, I just thought he was ignorant and didn’t know yet that Hitler had sent them all.”

And here we have the key sociopolitical reasons, besides fearful personalities, to explain why skeptical skills failed. We must keep in mind that critical thinking sometimes is put to the test even among the less phobic and more educated skeptical listeners. Social context can make a difference. People who were listening to the show without family members nearby, or were told to listen to the show by a scared neighbor or friend, were more likely to panic, according to Cantril. Of course, in 1938, before television, most people kept up with the news about Hitler and Europe by listening to the radio. America was emerging from the Depression and listeners with economic worries tended to be more susceptible to suggestion. Comic strips and radio shows like Buck Rogers and other mysteries of science and advances in technology received media attention throughout the 1930s, so stories of visitors from outer space seemed plausible to some listeners.

Still, those time-specific causes only go so far — the same radio play, broadcast in Spanish, caused a similar panic in Ecuador 11 years later.

Developing critical ability and constructive skepticism clearly does not always inoculate us from moments of emotional panic,
especially when the context is most threatening. Cantril stated it well: “If critical ability is to be consistently exercised, it must be possessed by a person who is invulnerable in a crisis situation and who is impervious to extraneous circumstances.”

So this Halloween, when the news media scare us with warnings about razor blades in apples and tainted candy, remember not all stories told are real.

Fear of needles, blades and poison lurking in trick-or-treaters’ candy bags is way out of proportion to verified incidents and perhaps just as unreal as this old radio show.

So, relax, put on a scary movie or listen to the original “War of the Worlds” broadcast, and enjoy the little green people and other UFO-costumed kids who ring your doorbell. Boo, indeed!

**Horoscopes — Fun But Utterly Fallible**

*Miller-McCune.com’s resident skeptic, just as you might expect of a Scorpio, will have no truck with horoscopes or astrology.*

Despite identifying as a bona fide skeptic, I admit I know my zodiac sign. I celebrate my birthday in early November, and every now and then someone reacts to that information with an assertive, “I just knew you were a Scorpio.”

If you could really tell, then why didn’t you say something before I mentioned it? And besides, what is it that I exude that verifies my Scorpiosity? What is a Scorpio anyway?

That I should have something in common with Joni Mitchell, Joan Sutherland and Mary Travers (of Peter, Paul, and …) who were all born not only under the Scorpio sign but on the same day as I, boggles my mind. I cannot carry a tune, not even in the shower.

According to the [Urban Dictionary](http://www.urbandictionary.com), “Scorpios are the people most likely to denounce stuff like astrology … they are serious and skeptical people.” Well, maybe there is something accurate about horoscopes after all. So, let me fulfill my Scorpion destiny and look critically at what we know about horoscopes and zodiac signs.

In a classic 1948 experiment by psychologist Bertram Forer, subjects completed a personality test and received a written assessment of their results. Forer asked them to rate the accuracy of their personal profiles; the result was very high ratings (an average 4.26 where 5 is “very accurate”).

However, each person received the exact same assessment that Forer took from a newspaper horoscope: “You have a need for other people to like and admire you, and yet you tend to be critical of yourself. While you have some personality weaknesses you are generally able to compensate for them. You have considerable unused capacity that you have not turned to your advantage.”

What Forer discovered was that people have a tendency to accept vague and general statements as accurate about themselves without the benefit of any objective measurement. When empirically false statements sound positive, they will agree that the traits describe them accurately. This subjective perception is sometimes called the Forer effect.

But since P.T. Barnum is believed to have said “we have something for everyone,” psychologists often label this process of subjective validation as the “Barnum Effect.”

Take a simple test to illustrate. Decide how well this statement describes you: “You like work that is meaningful and dislike demeaning jobs; you prefer the truth and you dislike shallow relationships.” Sound familiar? Yet according to an online astrology website, these are typical Scorpio characteristics.

Over 60 years of research continue to verify that people read into horoscopes what they want to believe. Perhaps there’s no harm in that, if what you read motivates you to achieve your goals, to find happiness with loved ones, and to avoid making
life-threatening mistakes. (Ouch, I’m starting to write like a horoscope.) Research has consistently verified the existence of subjective validation, so let’s look at horoscope research from a different angle. Can different zodiac signs objectively distinguish people’s opinions and behaviors?

Data from the General Social Survey — the largest random sample source of the Americans’ opinions, collected regularly since 1972 by the National Opinion Research Center in Chicago — include information about respondents’ astrological signs. Using this dataset, I ran some statistical tests evaluating differences among the 12 zodiac signs on several different criteria. Since many horoscopes indicate some people born under certain zodiac signs are more outgoing and better at making friends, I used GSS items asking about differences in the number of good friends respondents have, the number of close friends they have in the workplace, and the number of friends close enough to discuss problems. The differences among all 12 groups for each of these three items were not statistically better than chance.

Scorpios, for example, did not have more or fewer close friends than people born under any other sign. Psychologist Charles Reichardt also found similar weak relationships between zodiac signs and political views. Intrigued that the horoscopes on an online website suggested that Taurus, Sagittarius and Virgo people tend toward conservatism, he looked at 40,637 respondents in the GSS dataset and found no statistical difference in identifying oneself as liberal, conservative or moderate among the 12 zodiac signs. Using several other measures, Reichardt concluded that “astrology provides little if any basis for accurately describing individual human differences.”

Even professional astrologers, however, might pooh-pooh mass market horoscopes. So researchers John McGrew and Richard McFall conducted a more elaborate study in 1990 going beyond simple newspaper horoscopes and focused on detailed astrological charts.

They had six expert astrologers and one nonastrologer attempt to match the birth chart horoscopes (prepared by professionals from the Indiana Federation of Astrologers) of 23 people to their case files, which contained life histories, photos and results from a standardized personality assessment and a vocational interest inventory.

Now predict the outcome! You got it: None of the six astrologers was able to match the 23 astrological charts with the 23 case files better than the one nonastrologer or by chance alone. More embarrassingly, there was very little inter-astrologer agreement.

Reading horoscopes can be fun and entertaining. But using what they tell us, or what an astrologer might derive from a detailed and expensive birth chart, requires critical-thinking skills before acting on the readings. How would the alignment of stars and planets affect your personality? Why would a Scorpio born in 1906 have the same horoscope characteristics as a Scorpio born in 2006? And what could I possibly have in common with Joni Mitchell?

In any case, have a happy birthday fellow skeptical Scorpios. Remember we do have some things in common: We were all born under the best sign and critical thinking brought us to that undeniable conclusion!

All I Want for Christmas Is the Truth
Our resident skeptic takes a look at some of the mythologizing that has arisen around the West’s winter holidays, from poison plants to phantom Der Bingles.

By now, if you hear just one more elevator-version of “The Christmas Song,” you may be ready to throw something other than those chestnuts on the open fire and bemoan the unending commercialization of the holiday season. Yet we should not throw our skeptical skills also on the Yule log and look uncritically at the stories and customs we may hold dear this time of year.
When did Christmas become such a commercial event?

Quite some time ago. Many holiday traditions are secular in origin and not religious at all. For example, **Rudolph the Red-Nosed Reindeer began as a promotional character** created by Robert May for the Montgomery Ward department store in 1939. And the Coca-Cola Company in the 1930s, appropriated the image of a jolly, ruddy-faced Santa for its commercial campaign to get people to drink its soda in the winter months, thereby establishing our contemporary portrayal of what **originally was a much thinner St. Nick**.

Many religious organizations, and some conservative commentators, created a furor several years ago claiming there was a “war on Christmas” brought about by such supposedly politically correct greetings as “Happy Holidays” and by failing to keep Christ in Christmas when using the shortened “Xmas.” However, the X in “Xmas” is not the same as the X in “X-Factor.” It is instead chi, the Greek letter representing Christ. Documents since at least the 11th century used X or XP to symbolize the word Christ (XP is from the Greek chi and rho, the first two letters of Christos) and Xt (for Christian). So a **“Xmas” greeting actually continues that religious tradition**.

One holiday custom is giving (or regifting!) a colorful red plant. Perhaps you’ve heard that the ubiquitous holiday bloom, *Euphorbia pulcherrima*, the poinsettia, may kill you if swallowed.

In reality, it’s fatal to your skeptical skills if you swallow the rumor that it is a poisonous plant. The Aztecs in the 15th century used the milky white sap from the plant to control fevers. While some people (especially those allergic to latex) may get skin irritation from the sap, **the poinsettia is not poisonous if eaten**. Native to Mexico, it was brought to the United States in the 1820s by Joel Roberts Poinsett, the first U.S. ambassador to Mexico. Poinsettia were sold commercially in the early 1900s by the Ecke family ranch near San Diego (**where the majority of today’s poinsettia plants come from**).

Earlier this month came the celebration of Hanukkah, another holiday replete with myths that deserve our skeptical eye. Hanukkah recalls the Jews’ rededication of the Temple in Jerusalem around 165 BCE after the Maccabees were victorious over the Syrian king. It was not created as a response to Christmas and although its date varies on our **Gregorian calendar**, it’s always the Hebrew calendar date of **25 Kislev**.

Despite what many believe, **Hanukkah is not a major holiday** in religious Jewish households compared with Rosh Hashanah or Yom Kippur. Many people also mistakenly think that the familiar seven-candle menorah is used for the holiday. Actually, it’s a **hanukkiah, a nine-candleholder version** used during the Hanukkah period. Gift giving and eating jelly doughnuts were not part of the historical record!

Even Kwanzaa, a seven-day African-American and Pan-African event created in 1966, must counter some popular myths. It is not a replacement for Christmas or a religious holiday. The celebration begins the day after Christmas and is based on the rituals of African harvest festivals. **“Kwanzaa” is Swahili for “fresh fruits”** and celebrates family, community and culture.

Scholarly research also provides us with some important ideas about the holiday season. A common misconception is the belief that suicide rates increase during this holiday time. Contrary to media reports and urban legends, **suicide rates typically decline during the Christmas season**. Research conducted in England also found that the number of incidents of deliberate self-inflicted harm, an indicator of depression, tended to be **below average during Christmas week**.

Whether you celebrate the secular or religious versions of the many winter holidays, it is impossible to avoid the visual and aural onslaught of Christmas music and imagery.

In an unusual 2001 research study, based on what is called the “White Christmas test,” students listened to white noise over headphones and were told to press a button when they **believed they heard a recording of Bing Crosby’s “White Christmas”** — even though this song was played only as they entered the soundproof room, not during the three minutes of white noise.
This test is based on hallucinatory research demonstrating that some people, perhaps those more prone to fantasy, tend to report auditory events that are suggested to them. In this study, 32 percent of the subjects said they heard “White Christmas” over their headphones; those students also scored higher on an index of fantasy proneness. What this all means is that you are possibly hearing “White Christmas” as you finish this article even though you’re not in a shopping mall or elevator. So go ahead and throw some chestnuts on an open fire and sing it out. Happy Holidays and to all a good night.

Let’s Resolve to Be Less Superstitious

Every January we’re treated to a display of superstitious rites that lie forgotten the rest of the year.

With the new year firmly up and running, you may already be second-guessing those pesky resolutions so firmly declared a few weeks ago. Researchers at the University of Hertfordshire in England discovered that only 12 percent of people in their study successfully kept their New Year’s resolutions by the end of the year. Keeping focused on one specific resolution — not some general one made in previous years (“lose weight”) or chosen haphazardly at the strike of midnight (“no more alcohol”) — yielded better results.

This belief of creating ourselves anew at the start of the calendar year has its roots in a superstition that what we do on January 1 affects us in the ensuing year. At midnight, we kiss our loved ones to guarantee continued romance and affection; we make loud noises to ward off evil spirits; we wear new clothes to ensure our ability to continue buying the best garments during the year; and we avoid crying, talking of death, and breaking things on New Year’s to prevent bad vibes in the months ahead.

Cultural differences abound: Eating black-eyed peas on New Year’s is essential in some Southern U.S. states, while consuming 12 grapes is a tradition in many Spanish societies. For the British, the “first-footer” superstition claims that the first person to cross your threshold on New Year’s day will determine whether it will be a year of good or bad luck. And, it goes without saying, the baby born on New Year’s is the luckiest child of all — except as she grows older and realizes that being born so close to Christmas often precludes additional parties and gifts.

Critical thinking skills and skeptical reasoning influence how we view these beliefs and how seriously we invoke the yearly customs. Superstitions of one kind or another often play a role in our daily lives even when we might not consider ourselves the “superstitious type.” Perhaps you insist on wearing a particular lucky shirt when competing in a sporting event, or take along that special pen to the next exam because it always helped you earn an A on earlier tests. Admit it: You’ve knocked on wood to ward off some potentially bad luck or carried around the foot of some dead furry animal.

Despite our rational skills, a good many of us at one time or another have invoked a harmless custom or superstitious ritual.

A superstition is typically a groundless and nonscientifically established belief in the property of objects or actions to magically produce specific outcomes. Yet for some people, superstitions can be a more serious matter than the benign customs we sometimes endorse. For these folks, superstitions and related magical actions can seriously impact their daily lives. When was the last time you were in a hotel and noticed that the elevator went from the 12th floor to the 14th? Of course, when you’re told your room is on the 14th floor, and you realize it’s really the 13th, you lock the bathroom door when taking a shower, just in case this Ritz becomes the Bates Motel! There really are some people who take this unlucky 13 seriously enough to affect their behavior. According to a 2007 Gallup Poll, 13 percent of the respondents (yes, 13 percent!) admitted to being bothered if given a room on the 13th floor of a hotel, and most of them would ask to change rooms. Women were twice as
likely as men to be superstitious and bothered by the 13th floor and three times as likely to ask for a room on another floor.

Stuart Vyse’s 1997 study Believing in Magic: The Psychology of Superstition concluded that superstitious people tend to be less tolerant of ambiguity and more stressed, feel less in control of their lives (often depressed and have lower self-esteem) and have a greater fear of death. Superstition is also related to misunderstanding probability, resulting in errors in reasoning and selective confirmation of already-held beliefs.

For example, consider the gambler who wears his lucky socks to the casino and wins a huge jackpot at the slot machine. On the next visit to the casino, the lucky socks are left at home and the gambler loses quite a bit of money. Superstition dictates that there is an evident connection between the presence of lucky clothing and success at getting money from the machines. The magical properties inherent in the socks appear confirmed, yet the gambler forgets a basic principle of probability theory. Given the large number of people playing slots in the many casinos in the world, chance alone guarantees someone will win big. The “law of truly large numbers” states that when numerous people are engaged in some behavior, unlikely events are virtually certain to occur. It would be very rare for one person to flip a coin 10 times and get 10 heads. But put 1,024 people in a room each flipping a coin 10 times, the odds are that one of them will get 10 heads in a row. Large numbers of people improve the chance of a rare occurrence. Lucky clothing, a knock on wood, or a rabbit’s foot can appear to work pretty well. Let’s hope that the rituals you invoked as we welcomed 2011, and the resolutions you strive to follow, bring you good fortune, lucky socks and at least 13 months of critical thinking and skeptical reasoning.

Magical Elixirs and Beneficial Bracelets
Surely wrapping a hologram around my wrist in a neoprene band has got to allow me to maximize my greatest potential.

A few days ago I was walking through the local shopping mall and a salesperson staffing one of those ubiquitous kiosks approached me with an intriguing offer. He claimed I could improve my balance, brain functioning and stamina — for only $30 — by wearing a special wristband. Somehow this silicone bracelet with two “ionized holograms” harnesses our natural energy flow and restores our electrical fields, which may have become unbalanced.


How does it work, you ask? Well, here’s the “science” behind the original version of the bracelet I saw. According to its Web page, “Power Balance is based on the idea of optimizing the body’s natural energy flow, similar to concepts behind many Eastern philosophies. The hologram in Power Balance is designed to respond to the natural energy field of the body. The Mylar material at the core of Power Balance has been treated with energy waves at specific frequencies. The resulting Mylar is believed to resonate and work with your body’s natural energy flow to help enable you to perform at the best of your ability.”

Got that? And it doesn’t matter if you purchase the silicone or neoprene version, since the secret is in the holograms. Needless to say, this sales pitch did not throw my critical thinking brain functioning and skeptical stamina off balance. I resisted purchasing the magic bracelet, despite a money-back guarantee that informed me “there is no assurance that it can work, for everyone.” Got it.

With $35 million in sales in 2010 and millions sold, surely something must work for Power Balance?

Let’s see what some research might tell us. John Porcari, and Rachel Hazuga from the University of Wisconsin-La Crosse exercise and sports science department, found no difference in performance among 42 athletes who did not know if they were
wearing the authentic wristband or a fake silicone band. All improved in a balance test no matter if they had the $30 or 30 cent version. The researchers attributed this improvement to the placebo effect, and like a pair of lucky socks, if you believe it strongly enough. Or to use the Power Balance people’s own words: “Power Balance will not make you stronger than you are, but is designed to help make you as strong as you should be by interacting with your body’s natural energy flow.”

Still, some people are able to resist this marketing push’s own natural energy flow. The Australian Competition and Consumer Commission claims these wristbands are no more beneficial than a rubber band and ordered Power Balance to remove the product from the Australian market and issue refunds. The company has since admitted that “there is no credible scientific basis for the claims and therefore no reasonable grounds for making representations about the benefits of the product.” A class-action lawsuit was filed in January claiming similar misleading trade practices are used in the U.S. The company remains defensive and uses the old technique of promoting anecdotes over scientific methodology: “Numerous actual consumer testimonies supporting the wristbands’ performance were provided to the ACCC by Power Balance. Despite that, they requested Power Balance remove marketing claims until it could provide them with their narrow criteria of randomized, double-blind scientific studies that supports [sic] the use of those marketing phrases.”

Imagine that! Asking for research based on such criteria when testimonies from people — think Shaquille O’Neal! — who need to justify spending $30 on a fancy rubber wristband would do just fine. Narrow criteria indeed. Scams to promote health should come as no surprise to skeptical thinkers. This is not the first wristband to work wonders. For many years now, copper bracelets have been promoted to alleviate arthritis, improve the immune system, increase iron and zinc in the blood and produce collagen to help heal wounds. Once again, our friend the placebo effect proves to be a powerful force.

While no harm may come from wearing hologram bracelets, other than to one’s wallet, preying on people’s fears about health issues, performance capabilities and physical appearances has unfortunately had a long history. Traveling medicine shows pitched their so-called patented products and bogus equipment that promised miracle cures when used as directed. European mountebanks in the Middle Ages and American medicine men in the 18th and 19th century promoted the art of selling and pushed all sorts of amazing cures for baldness, venereal disease and fatal ailments. The emergence of these so-called “patent medicines” and the harmful results and deaths eventually led to the creation of the Pure Food and Drug Act in the United States. Today, the Food and Drug Administration monitors health claims and frauds. Topping the FDA list of scams are supposed remedies for cancer, HIV/AIDS, arthritis, obesity, erectile dysfunction and diabetes.

And its advice provides the basic critical thinking tools we should regularly use: be wary about easy and quick fixes, promises of no-risk money-back guarantees, undocumented anecdotal case histories, use of impressive-sounding terms and secret or natural ingredients.

Does this sound like a neoprene wristband with a secret hologram that I can sell you? The power to keep your life in balance depends less on wearing a bracelet and much more on performing your best skeptical thinking skills.

Homeopathy Not All It’s Quacked Up to Be
Professional skeptic James Randi’s offer to pay a million dollars to the maker of any homeopathic remedy that actually works points out the logical fallacies in this branch of ‘medicine.’

In February, magician James Randi offered $1 million in a challenge to the manufacturers of homeopathic products to prove their claims. He also asked major drugstore retailers to discontinue carrying these “fake medicines.” Randi, the recipient of a prestigious MacArthur “genius” grant, is the founder/chair of the James Randi Educational Foundation, which promotes critical thinking by investigating paranormal and supernatural claims. For many years, another million dollars has also been available “to anyone who can show, under proper observing conditions, evidence of any paranormal, supernatural, or occult power or event.” Yet, the money remains in an escrow account, earning interest, unclaimed by hundreds of applicants. Now it’s time for the homeopathic community to get at Randi’s money. And it doesn’t take a psychic to see that this money will also likely earn interest in an escrow account for years to come.

According to the Homeopathic Pharmacopoeia of the United States, homeopathy is “the art and the science of healing the sick by using substances capable of causing the same symptoms, syndromes and conditions when administered to healthy people.” It is based on the concept similia similibus curentur, a Latin expression for “let likes be cured by likes.” Developed by German physician Samuel Hahnemann in his 1810 publication Organon of Rational Therapeutics (now referred to as Organon of Medicine), homeopathy has held a controversial relationship in the medical profession. The homeopathic medical school, Hahnemann Medical College in Philadelphia, stopped focusing on homeopathy in 1920, and ceased offering even elective courses in homeopathy in the 1940s.

Yet, these products continue to be sold, resulting in wide-ranging reactions about their efficacy. Other than anecdotal documents, scientific testing has not established that “like cures like.” In fact, it’s not based on any law of nature or even logic. Follow along with this: a typical remedy involves diluting the relevant ingredients in ever-increasing amounts of distilled water (often mixed with ethyl alcohol) and shaking — or what homeopaths call “succussion” — to the point that barely any molecules of the original substance are left in the preparation. This process results in the “potentization” of the original ingredients and liberates the essence and energy of the substances into the preparation.

In other words, and scientifically contradictory, homeopathic remedies are made powerful by serial dilutions and shakings, even though only trace amounts remain of the original ingredients or none at all. Analogies colorfully describe the equivalent dilution: a pinch of salt in the Atlantic Ocean or, as Hahnemann himself said, a bottle of poison in Lake Geneva. Take as an example Arsenicum album, a very popular homeopathic ingredient derived from arsenic. Too much can kill you but diluted to the point that it’s virtually undetectable is supposedly helpful in curing the very symptoms that arsenic causes: headaches, confusion, diarrhea, drowsiness and convulsions (but presumably not death). And while we’re at it, toss in anxiety, asthma, food poisoning, flu, psoriasis, flaky scalp, dry eczema, nasal discharge, sore throat and pink eye. The critical thinker should always wonder about any one product that claims to do so much, let alone with a preparation that is chemically barely more than water.

Needless to say, this stretches the skeptical imagination and begs for some scientific research. Or even a personal demonstration: Randi, in his own one-person experiment, swallowed an entire bottle of homeopathic sleeping pills with nary a nodding head.

But let’s hear from real scientists. Edzard Ernst, the first professor of complementary medicine in England and former homeopath, scientifically reviews and studies alternative practices. With much controversy, his 2009 American Journal of Medicine article with Michael Baum claimed that “Homeopathy is among the worst examples of faith-based medicine that gathers shrill support of celebrities and other powerful lobbies in place of a genuine and humble wish to explore the limits of
our knowledge using the scientific method.” The authors concluded after reviewing numerous studies that “so far homeopathy has failed to demonstrate efficacy in randomized controlled trials and systematic reviews of well designed studies.”

Really though, what’s the harm if at worst it’s just another proof of the power of placebo? Surely you wouldn’t mind if your cold went away six or seven days after taking the homeopathic preparation!

What are the ethical, moral and public health issues when pushing a homeopathic remedy to prevent malaria that is 99.99 percent water with hardly a trace of quinine? And what about the “natural” preparation that promises to cure HIV/AIDS by “oxygenating the cells” and bringing your T-cells back to normal? Or, as a website exclaims: “Approximately 15,000 European Doctors, Naturopaths, and Homeopaths have supplied this amazing remedy to more than 10 million people during the past 70 years to heal over 50 different diseases.”

Being skeptical and thoroughly investigating remedies that defy physics and chemistry can help you avoid taking homeopathic substances that may be safe but not effective. More importantly, these treatments could prevent you from trying ones that actually work. Figuring out what works best with established scientific methodologies is the million-dollar question worth pursuing.

Understanding Popular Uses of Percentages

While “figures lie and liars figure,” that’s no reason not to pay attention to some basic facts about common numerical comparisons.

Four New Jersey women in March accused the Campbell Soup Company of misleading customers with claims of lower sodium levels in its “25% Less Sodium Tomato Soup.” Whether the soup has more or less sodium than regular versions is not for me to investigate. I want to focus on the “25% less” phrase — a type of claim we see regularly in ads and new product labels — and in the process provide some numerical literacy skills to our arsenal of skeptical thinking tools.

In an age when quantitative thinking is at a premium and “innumeracy,” as cognitive scientist Douglas R. Hofstadter termed it, is a problem, many people easily misinterpret numbers and become wary about statistics. Sometimes this skepticism is for good reason – remember that oft-cited phrase “there are three kinds of lies: lies, damned lies and statistics.”

But turning our backs on numbers is a mistake. We require critical thinking skills to make sense of data that appear in commercials, politician-mediated public opinion polls, official documents and research studies.

Consider this paragraph from a New York Times article about the increase in multiracial people in the latest 2010 U.S. Census: “In North Carolina, the mixed-race population doubled. In Georgia, it expanded by more than 80 percent, and by nearly as much in Kentucky and Tennessee. In Indiana, Iowa and South Dakota, the multiracial population increased by about 70 percent.” A few paragraphs later the article reports a possible national multiracial growth rate of 35 percent, maybe even a 50 percent increase from the last census in 2000 when 2.4 percent of Americans selected more than one race.

With these numbers coming at you fast and furious, it takes a moment to reflect on what is actually being said and what information is missing.

First, it’s essential to understand how percentages are calculated. At the simplest level, percentages are meant to standardize comparisons among two or more groups. For example, it would be accurate to report that Californians apply for the most passports in the U.S., averaging more than 2 million a year. As the most populous state, this isn’t surprising. But it turns out that California is behind five other states, including New Jersey and Alaska, when taking into account the relative population of the states — in other words, the percent of citizens with passports. (I leave it up to you to create your own inventive
explanations why these two states have more citizens per capita with passports!) What can get confusing is how the numbers are reported.

A percentage point is the simple difference between two percentages, so that a change from 20 percent in the population supporting Candidate A in the election to 30 percent a few months later indicates an increase in 10 percentage points for the struggling politician. Yet, this 30 percent is an increase of 50 percent over the original 20 percent. Got that?!

To calculate this, you take the percentage point difference and then divide it by the original percentage (10/20=.50). You can now claim in your ads that your candidate has improved by 50 percent in the favorability rating (rather than the way the candidate’s opponent would present the same story saying there was merely a 10 percentage point increase)! Perhaps some people will erroneously conclude your candidate went up 50 points from 20 to 70 percent in the polls — and maybe even became less salty in the process — would be a happy, if not entirely unexpected, accident.

Going back to the Census figures quoted in The New York Times, it’s one thing to claim that the multiracial population may increase 50 percent, but when the original figure is only 2.4 percent of Americans, a 50 percent increase simply means that the 2010 multiracial population could end up around 3.6 percent of the population. The number 50 surely sounds more impressive than the smaller 3.6 figure. Manipulating these numbers can create misleading impressions, sometimes done with intention.

Imagine you were creating an ad for a new baldness cure. You can easily fool a non-skeptical audience by exclaiming that after trying your fabulous wonder product for several months, there’s been a 50 percent increase in satisfaction. Of course, you don’t reveal that only 3 percent love the product after six months compared to a measly 2 percent raving about it as the sure-fire cure after month one.

Being able to interpret numbers correctly often comes down to reporting all the relevant data. In The New York Times article, we really do not have enough information to know exactly what the multiracial population is in the states listed. That they doubled in North Carolina and increased 80 percent in Georgia tells us little about the actual 2000 or 2010 census figures in those states.

The Chicago Guide to Writing about Numbers reminds us always to identify clearly the items being compared and to express differences as percentages of the initial reference values. An increase of 50 cents when purchasing a cappuccino is a little more annoying that the same amount tacked onto the price of a new car.

When it comes to statistics and developing critical quantitative thinking skills, also remember what some wag once opined: “98 percent of all statistics are made up.”

What Do Osama bin Laden and Paul McCartney Have in Common?

Conspiracy theorists have already emerged from the woodwork asking if bin Laden is really dead, or if he was dead already. Don’t be fooled.

To quote Mark Twain, “The rumors of my death have been greatly exaggerated.” Is anyone expecting Osama bin Laden to send a tape with this message? Will Donald Trump demand a long-form original copy of the death certificate? Comedians aside, will people around the world really believe Osama is gone?

Conspiracy theorists quickly voiced concerns about the terror leader’s burial at sea, suggesting that the U.S. faked the raid for political purposes and that bin Laden might have already died years ago or might still be alive. Today, President Barack Obama announced he wouldn’t release postmortem photos of bin Laden’s body. This news will surely fan conspiracy theory flames.
We’ve certainly heard many rumors about famous people’s deaths over the years. In the fall of 1969, fans were scrupulously reviewing Beatles album covers searching for hidden and interpretable clues that Paul McCartney had died in a car accident. He was, after all, the only Beatle crossing Abbey Road barefoot on the iconic cover of the album of the same name. The band’s “Strawberry Fields Forever” song supposedly had the phrase “I buried Paul” hidden in the background. Clear and unquestionable proof Paul was dead!

Attempting to debunk rumors often only reinforces the story. When McCartney appeared on the Nov. 7, 1969, Life magazine cover to verify his alive status, clue-hunters responded that if you held the cover up to the light, you could see a photo of a car superimposed on McCartney’s face, thanks to a car ad on the reverse side. What could be clearer affirmation of his fate?

Of course, the Paul-is-dead rumor was a playful game, but in this era of immediate social networking, death rumors can spread even more rapidly. By definition, a rumor is a piece of information that has yet to be proved true or false. Rumors tend to proliferate in times of ambiguity when information about an issue is lacking. People often speculate about possible explanations to fill in the blanks and thus contribute to the spread of unsubstantiated information. Fueled by anxiety, these rumors take on a life of their own.

Many rumors float about celebrities like George Clooney, Natalie Portman, Tom Hanks and Jeff Goldblum, who each supposedly died in some horrible accident, or like the one about Jerry “The Beaver” Mathers, getting killed in the Vietnam War. None of these, of course, were true. On the flip side, rabid fans of certain dead celebrities continue to believe their hero is still here and in hiding. An Elvis-is-alive website offers “proof” of his continuing existence; some believe comedian Andy Kaufman’s death is one of his biggest performance-art hoaxes; and — it goes without saying — Michael Jackson faked his own death to avoid the financial and personal pressures he was facing.

And when it comes to problematic political leaders, demand for solid proof of their deaths becomes a much more serious issue with ramifications for the stability of governments and international peace. Consider the capture and death of Saddam Hussein: Video proof of his hanging circulated on the Internet to end rumors he was still alive. Calls for proof that his sons Uday and Qusay were also killed circulated after their reported deaths.

Did Hitler really commit suicide in his bunker? What did happen to his body? Does it really take a photo like Mussolini hanging upside down to prevent people from believing a dictator’s death has not been faked?

Just be warned: Already scammers have created phony photos and videos of bin Laden’s death circulating on Facebook and Google. Please don’t click on these links — they’ll likely put you at risk for computer viruses, and you may be shunted to websites requesting personal information.

But like the photo of Paul McCartney in Life magazine, will these visual and verbal “proofs” of well-known people become new sources of ambiguity, leading anxious people already prone to conspiracies to spread rumors that their deaths have indeed been greatly exaggerated?

It’s the (Alleged) End of the World as We Know It

A couple of prominent end-of-the-world predictions may or may not come to pass, but lots of people promoting them are betting your bottom dollar they won’t.

If you are reading this after May 21, congratulations. You have survived yet another doomsday prediction.

For the past several months, Family Radio Worldwide has been spreading the message that Judgment Day is scheduled for May 21, 2011. This news probably comes as a surprise to those of you who thought the Mayan calendar picked the winter
solstice of Dec. 21, 2012, for the big finish. Or at least a shock for those of you who sat through the 2009 disaster movie 2012 and thought it might be a documentary.

What’s going on now is a sort of “dueling apocalypses” between two dates, two cultural traditions and two visions of humankind.

Let’s postpone our demise by considering the Mayan date first. As one website touts: “Every Major Source of Knowledge, from Einstein to NASA to Worldwide Religion … They ALL AGREE THAT… In 2012, something huge will happen.” Of course, to find out what to do about whatever will happen, you have to shell out $47. It doesn’t take long for your favorite search engine to reveal thousands of other links and websites devoted to 2012 and the secrets on sale that can save you and your family’s lives.

Typical scenarios claim destruction due to a rogue planet or asteroid colliding with Earth, solar eclipses and solar flares, flipping of the Earth’s rotation axis and supernova radiation. Nostradamus was dragged into the 2012 storylines with the prediction that the sun will rise in alignment with the center of the Milky Way, spelling doom.

Amid all the claims and scams, lonely voices of critical thinking can be faintly heard. Research by Gerardo Aldana at the University of California, Santa Barbara questions the correlation between the Mayan calendar’s dates and our modern Gregorian calendar, thus challenging the accuracy of the Dec. 21, 2012 end day. And studies by scholars at the Foundation for the Advancement of Mesoamerican Studies offer sensible antidotes to the 2012 hype and exaggerated inaccuracies, regardless of the actual date.

These 2012 fears are only reasonable, I suppose, once (or if!) we pass through May 21 unharmed. While the Mayan doomsday scenario derives from solar and planetary movements, the 2011 end comes from Biblical evidence. For this is the date that the Rapture — “beyond the shadow of a doubt,” as one preacher claimed, although there’s a lively industry for rapturologists out there — will occur and fires will punish humans for their sins. This certainty is based on Biblical calendar calculations.

Essential to the math is equating one day with 1,000 years. Therefore, since the Flood from Noah’s time happened in 4990 B.C., and because the seven days in Genesis are really 7,000 years, it follows that $4990 + 7000 = 2010$, plus 1 (because there is no year 0), resulting in 2011. The May 21 date is the 17th day of the second month of the Biblical calendar, echoing the date of the Flood, which also occurred on the 17th day of the second month in 4990 B.C.

But May 21 is just the start of the Rapture, an intro when earthquakes will ravage the earth and bodies of the saved will be “caught up” into heaven. The actual end of the world will occur five months later, on Oct. 21, 2011; “they should be tormented five months,” according to Revelation 9:3-5.

Luckily, if you are one of the estimated 2 percent of the world’s population to be saved, no need to worry about your pets. In what has to be one of the world’s most creative entrepreneurial endeavors, a group of atheists has started an “after the Rapture” service: “For $135.00 we will guarantee that should the Rapture occur within ten (10) years of receipt of payment, one pet per residence will be saved. Each additional pet at your residence will be saved for an additional $20.00 fee.” Thank God for atheists.

Or, if you prefer not giving your money to such ungodly folks, another website run by a Christian woman will assign your pets to non-Christian volunteers for a nominal fee of $10.

Should you run a church or ministry and worry about where your organization’s assets will go after the Rapture, remember to add “Rapture Terms” to your will: “in the event of the Rapture, all or a significant portion of the testator’s estate is to be given to the Rapture Fund — an organization dedicated to promoting the Gospel both now (using charitable contributions made by donors during their lifetimes) and during the Tribulation (using assets donated by those who have signed the Rapture Terms).”
It’s not my place here to challenge religious people who interpret the Bible literally or to dissuade people from following their faith. When others, however, exploit believers and develop methods to scam people out of their money, then our skepticism demands we use our critical thinking skills to fight fraud.

End-of-the-world hoaxes have had a long history, prevalent in the Middle Ages and at major turns of the calendar. Remember Y2K? There were at least 42 predicted doomsday events in the year 2000 alone. With hundreds of other previously predicted dates passing without notice, the upcoming events in 2011 and 2012 will also dissolve quietly. But just in case, send me a monthly check now to guarantee continued skeptical thinking which I can teach your left-behind friends. Maybe I can even care for your pets.

Scamming Grandma Sadly Common

Scams targeting the elderly are among the most common, but a little skepticism can keep their years golden.

It began late one evening when Harriet, already in bed, answered a call from someone claiming to be a police officer. The caller said that Harriet’s grandson was in a car accident while traveling in Canada and needed some money to tow and fix the car. “Could you please wire some money to us so we can get him on his way home?”

“Oh, and please, Grandma,” the alleged officer said, “don’t tell his parents, since they didn’t know he was taking this trip.”

By the way, Grandma, what a big checking account you have!

Yes, it’s a scam.

Sometimes the caller claims to be a lawyer or a close friend and — even more boldly — the grandchild herself, often with a less serious problem such as a missing wallet, lost airline ticket needed to get back from spring break, or a stolen credit card while traveling in Europe. The “grandparent scam” can also happen by email after access to email accounts has been compromised.

Regardless of the story, one red flag is that it always ends up with a request to have money wired immediately. Using cold-reading techniques, the scammers get you to provide the information they need. For example, when you answer the phone and the caller says “Hi, Grandma” it’s easy to respond with, “Is that you Billy?” Of course, the caller says “Yes, and I need your help,” and then proceeds to weave the trap.

Sure, many times the recipient of the late night call does not have any grandchildren, but it only takes a few correct guesses among hundreds of calls for the scammer to hit a jackpot, often averaging several thousand dollars each.

And with lots of personal and family information available on social networking sites, con artists now come prepared with relatives’ names, travel itineraries, and school and graduation information, making their probes more credible.

Critical thinking points us to several key patterns. For one, there is always a cry for immediate help — there can be no waiting, so wire money right away. And so there is no time to check the facts by alerting other relatives, and just in case, please don’t tell mom or dad or someone who might pop the bubble, the scammer pleads.

To add insult to injury, in a few cases, victims received calls from a scammer posing as an attorney who just happened to learn about their unfortunate recent financial fraud and can offer legal assistance — for a reasonable fee, of course.

Skeptic that you are, take the time to ask a few questions of people posing as a relative, or friend of the relative, that require answers only a family member would know, such as the name of a favorite pet or someone’s middle name. Be sure this same information is not readily available on a Facebook page or other public website. It’s also not too farfetched to give each family member a secret code word or phrase that could be used in emergencies to verify the caller (may we recommend “I love reading Miller-McCune”?).
Financial elder abuse is not limited to the “grandparent scam.” Reports of other scams on the rise include the “home repair fraud,” in which someone appears at the door and claims there are problems with your roof or hot water heater or electrical system. Of course, the phony contractor will do the work for you at a bargain rate, especially if you agree right now and pay a fee to lock in the special price. Maybe later the workers will actually return to repair the problem, or will do so using shoddy materials.

And do not assume you can win a lottery or sweepstakes that you never entered, especially when it’s required that your money be sent first to pay the taxes or handling fees upfront.

Another common financial scam misuses the once-reliable cashier’s check. In these cases, a cashier’s check is sent to the sweepstakes “winner” or to someone buying something off eBay or Craigslist to cover handling fees and taxes. The victim is asked to deposit it and then send a personal check for the same amount when the funds from the cashier’s are “available” for withdrawal by his or her bank. Since the funds from cashier’s checks are expected to be guaranteed, the victim quickly sends out their good money, only to discover a few weeks later that they’ve been presented a bad cashier’s check.

People of any age can be financial scam victims, but the elderly are specific targets. People over 65 are more likely to have accumulated some wealth and many have health problems that diminish their physical and cognitive abilities (including critical thinking). These factors make them vulnerable to scams and dependent on others for help in financial matters, opening up opportunities for exploitation by caretakers and relatives, as well as strangers.

It’s estimated that the vast majority of financial elder abuse goes unreported, most abuse is committed by family members, most victims are women, and incidents increase with age.

If you’re already in your golden years, stay skeptical and keep an eye on your gold. And if you’re concerned about an elder, be on the lookout for changes in powers of attorney through unusual or deceptive means; large amounts of money being withdrawn or transferred from bank accounts; arrival of new “best friends” in the household; and relatives with drug, financial, or legal problems getting involved in the elder’s finances.

These stories of financial abuse can happen to anyone — anyone who has not sharpened the critical thinking skills needed to prevent the big bad wolves from doing financial harm to Grandma.

Applying Healthy Skepticism to Healthy Foods

When superfoods like blueberries, pomegranates, açai, green tea sound a little too amazing, it might be time to take a closer look.

Summertime: outdoor concerts, beaches, barbecues. I don’t know about you, but my picnic basket is going to be filled with blueberries, pomegranates, açai, green tea, omega-3-laden fish and organic probiotic yogurts. This is the summer to start increasing my antioxidants and live longer.

Or so I thought before I rediscovered my critical thinking skills hiding on the bottom of the grocery cart.

Don’t get me wrong. It’s great to improve the way we eat. In July 2011, for example, the Los Angeles Unified School District stopped serving chocolate or strawberry flavored milk, which has about the same amount of sugar as soda. This follows similar bans in places like Washington, D.C., Boulder, Colo., Minneapolis and San Diego. Along with eliminating breaded foods (like corn dogs and chicken nuggets), these are reasonable moves given childhood obesity and diabetes rates, and provide a symbolic nudge to all of us.

Watching what we eat and curbing fatty, salty and caloric foods, exercising more and not smoking are essential steps. Unfortunately, they require day-in and day-out vigilance. So, believing that a variety of magic bullet “superfoods” will solve
our health problems and correct decades of disastrous dietary decisions, while an attractive hope, deserves skeptical investigation.

Many people like to believe that antioxidants are the key to longevity. We think that simply adding blueberries, red wine and dark chocolate to our diet will do the trick. As Barry Glassner points out in *The Gospel of Food*, these foods typically provide sensual and aesthetic pleasure, thereby increasing the production of endorphins, resulting in a cheerful demeanor. That alone can be a reasonable explanation of why we may be living longer, rather than attributing causation to the antioxidant foods alone.

Indeed, if antioxidants were sufficient to preserve our lives, Glassner points out, then consuming more packaged foods with the additives BHT and BHA — *fat soluble antioxidants* — should work just as well. *Cocoa-covered* BHT, anyone? We’ve been enamored of fad “superfoods” for some time (and just as opposed to “supervillain” foods like *high-fructose corn syrup*). In the late 1980s, oat bran was the *magic bullet*, although there may be a resurgence in sales given its central role in the popular French “Dukan Diet” making in-roads in many countries. And don’t leave out blueberries and how they reportedly reduce coronary disease, limit obesity, lower bad cholesterol, stave off Alzheimer’s, prevent cancer, improve cognitive skills, fight aging and combat *E. coli*, as one website points out. Let’s pause as we bake some blueberry oat bran muffins made with real cane sugar.

Today, we hear more about such fruits as pomegranate and açai (pronounced ah-SIGH-eee) and their amazing health benefits. A single study found that men treated for prostate cancer who drank pomegranate juice daily for two years showed a decline in a blood protein related to the disease. Pom Wonderful juice claimed it improved circulation and cardiovascular health, not to mention benefits for erectile dysfunction, but the FDA accused the company of violating the Food, Drug and Cosmetic Act by marketing its pomegranate juice as treatments for diseases.

Açai — what an Oprah show labeled the “world’s No. 1 superfood” — Superfood is a berry harvested in the rainforests of Brazil. Claims that it contains an unusually high amount of antioxidants lead people to embrace the fruit in all sorts of forms and disguises: freeze-dried capsules, vitamins, organic Kosher puree, juice, sorbet, ice cream, chocolate, tea, cereal, smoothies, and — my personal favorite — *dark chocolate covered açai with blueberries*. Eating all these açaí will purportedly increase libido, promote glowing skin and hair, support the immune system, reduce pain, lead to healthy sleep, rejuvenate the body and mind, possibly kill cancer cells, and act as an anti-inflammatory.

Whew! And that’s leaving out what so many scam Internet marketers claim for açaí: losing weight. The Center for Science in the Public Interest has warned consumers that claims of weight loss from açaí have not been supported by research.

What is it about these foods that supposedly work miracles? Is it the *anthocyanins, chlorogenic acid, catechins, pterostilbene*, or *resveratrol* doing the magic? If so, why not just take a single pill with megadoses of these ingredients and be done with it? Some argue that these antioxidants only work synergistically with other compounds found in the foods themselves and are not effective in pill form when isolated from other naturally occurring ingredients. Besides, to have any impact at all on our health, we would have to consume extraordinary amounts of these foods. To get enough resveratrol, for example, you have to drink anywhere from 3 to 40 liters of red wine a day. Crack open that bottle — or is it a barrel?

The key to unraveling the various claims is a healthy skepticism and a critical reading of research. In 2007, the European Union banned the use of the term “superfood,” which had been applied to more than 100 different foods, none having research supporting their health benefits. As a rule of thumb, any food that supposedly solves a large list of health problems — from Alzheimer’s to zits — should immediately be regarded with suspicion. Consumers need to review who is sponsoring the research and ask if it is published in a professional journal where the scientific methodology presumably has been vetted.
Often, claims are based on a single study, occasionally anecdotal, so we need to seek research that replicates the findings. In the meantime, focus on what is considered the best health plan: a balanced diet, mixing a rainbow of foods in reasonable portion sizes. And if you happen to like blueberries, green tea or red wine, then treat yourself — just don’t fool yourself. The simplicity of consuming a single superfood has appeal, especially if it has an exotic image. These are, after all, Brazilian rainforest berries, not sprouts from Brussels, in the picnic basket! Dare we yearn for the time long ago when a simple apple a day was enough to keep the doctor away?

Psychic Detectives Have a Perfect Record
The idea that legions of psychics are helping police solve crimes around the world is based on, well, nothing.

The afternoon of June 7, The New York Times sent out a news alert: “Up to 30 Dismembered Bodies Found Near Houston, Reuters Reports.” CNN also reported that the home near Houston involved “at least 20 bodies, including those of children.” The Liberty County Sheriff’s Office obtained a search warrant for the house in Hardin, Texas, and despite some conflicting information related to blood found on a door and strange odors, Texas Rangers were unable to locate any bodies or graves on the site.

While all this makes fine fodder for castigating reputable news organization like the Times, Reuters and CNN for being too fast on the trigger, Skeptic’s Café is interested in another aspect: Houston TV station KPRC reported the investigation all began with a phone call from a psychic.

Yes, a psychic. I knew you were thinking this. Psychic detectives often show up in stories about missing children, unsolved murders and cold-case crimes. Many people believe that police departments and detectives hire psychics for assistance, but one study found that two-thirds of the 50 largest U.S. police departments have never consulted a psychic to help them out in an unsolved crime. What’s a bit scary is that 35 percent did, although many times it is at the request of a family member, and their work typically interfered with the search. How effective are these psychics, and can any of them be good enough to claim noted debunker James Randi’s million-dollar offer by showing “under proper observing conditions, evidence of any paranormal, supernatural, or occult power or event”?

Take the story of Portland, Ore., clairvoyant Laurie McQuary. A creative sting was set up by the Inside Edition TV show in March. A producer posing as a distraught brother in search of his missing sister hired McQuary for $400. She looked at the photo of the girl and claimed she had been sexually assaulted and killed, but the case was still solvable. The psychic detective even pointed to a remote location on a map where the body could be found. The next day, McQuary was taped in an interview with an Inside Edition correspondent who revealed that the photo was the correspondent as a young girl and not the missing sister of the show’s producer. Asked how she could be so wrong, the psychic ended the interview and walked off the set. A sample of one does not prove the case, but 10 other psychics contacted by the show similarly stated the girl had been murdered. Such errors confirm what the FBI told Inside Edition: They were “not aware of any criminal investigation that has been resolved as a direct result of information provided from a psychic.”

In another case, dozens of psychics failed to discover a 20-year-old from Tennessee missing since April. Police wasted their time and resources tracking down the false leads. One of the psychics involved even participated in a cable TV show devoted to psychic detectives. (The show was canceled after 22 episodes failed to demonstrate a single case being solved with their supposedly paranormal skills — eerily, the exact same results of a similar show Down Under.)
But surely we’ve heard of some successes by psychic detectives. Consider the case reported in January in the New York Post: “A psychic eerily predicted where the victim of a suspected serial killer could be found — nine months before cops dug up the corpse and that of three other young women on a Long Island beach, police sources said.”

Claiming to see the body in a grave “overlooking a body of water” with a nearby sign that had the letter “G” in it, did the psychic really “nail it?” Turns out the body was not buried in a grave, any location on Long Island would be near a vaguely described body of water, and no sign was found. And if it had, would the letter “G” be a surprise on Long Island?

Skeptical thinking requires that we distinguish between vague, generally applicable common-sense statements and the precise breakthroughs demanded of serious investigations. On closer inspection, other than anecdotal accounts, there are no documented discoveries of missing persons by psychics.

Our critical minds demand some scientific research. Presciently, some studies have looked into psychic detectives. Richard Wiseman, one of the leading researchers on deception and paranormal phenomena, conducted a small study comparing the claims of three psychic detectives to three non-psychic students. They were presented with items that related to actual crimes and “asked to handle each of the objects and speak aloud any ideas, images or thoughts that might be related to these crimes.” They were also given statements that were true and false about the already solved crime.

Although the psychic detectives generated more ideas and thoughts than the students, many were obvious and not precise enough to provide helpful information to detectives. And the difference in accuracy between the students and psychics was not statistically significant. Neither group performed better than chance would predict.

Richard Kocsis, a leading Australian forensic psychologist, has extensively studied professional criminal psychological profilers and concludes that properly trained profilers help focus an investigation better than other comparison groups of psychologists, police detectives and psychics. In fact, he demonstrates “little support for the use of psychics in accurately generating the characteristics of an unknown offender.” Psychics performed the worst of all; they were unable to provide information beyond what common sense or “the local bartender might be able to surmise.”

I don’t know about you, but at this point, after hearing about all these psychics falsely claiming success in solving crimes, I can easily predict that it’s time for a long discussion with the local bartender. I knew you were thinking this.

Conversion Therapy Fails to ‘Pray Away the Gay’

Reparative or conversion therapy’s efforts to “pray away the gay” come a cropper when examined with a skeptical eye.

“Pray away the gay” joins other notable catchphrases in our popular culture and comedians’ repertoires, (perhaps like “wide stance” did just a few years ago.) This time it’s due to the efforts of Michele and Marcus Bachmann, who run a Christian counseling center practicing what is called “reparative therapy.”

Skeptical thinkers may ask how a simple prayer could change people’s core sexual orientation. Could heterosexual-oriented people “pray to be gay”? More seriously, why is there a treatment for something that is not an illness? A critical investigation into the practice of conversion therapy requires more serious scientific evidence than belief in the power of prayer alone.

Historically, some psychiatrists who viewed homosexuality as a mental illness tried electroshock aversion therapy as a cure. In more recent years, behavior modification became a less barbaric alternative. Endorsed mostly by religiously driven therapists to change sexual orientation, reparative or conversion therapy assumes that what needs to be repaired is an individual’s homosexuality, not the social stigma contributing to that individual’s negative feelings and behaviors. These ideas now are almost 40 years out-of-date.
In 1973, the American Psychiatric Association removed homosexuality as a disorder in its “bible,” the *Diagnostic and Statistical Manual of Mental Disorders*. Two years later the American Psychological Association, and later many other counseling, social work, and medical organizations, endorsed this revised view, leading almost all mental health organizations to oppose reparative therapy.

The American Psychological Association currently states “there is insufficient evidence to support the use of psychological interventions to change sexual orientation.”

Basing its position on scientific research and not anecdotal data, the American Psychological Association uncovered evidence demonstrating both harmful outcomes of conversion therapy and some helpful ones: “The benefits include social and spiritual support, a lessening of isolation, an understanding of values and faith and sexual orientation identity reconstruction. The perceived harms include negative mental health effects (depression and suicidality), decreased self-esteem and authenticity to others, increased self-hatred and negative perceptions of homosexuality; a loss of faith, and a sense of having wasted time and resources.”

Yet, the association’s conclusion stressed that these same benefits are equally achievable in affirmative psychotherapy models that avoid the harm attributed to attempts at changing sexual orientation.

Despite the conclusions of these scientific reports and statements by powerful professional organizations, repairing sexual orientation continues, and not just at Marcus Bachmann’s counseling center. Joseph Nicolosi’s National Association for Research & Therapy of Homosexuality is the most visible and controversial group. This organization argues “it does far more harm than good to tell a teenager that his or her attractions toward members of the same sex are normal and desirable. Teens in this position need understanding and counseling, not a push in the direction of a potentially deadly lifestyle.”

Critical thinkers may focus on words such as “normal,” “deadly” and “lifestyle” to spot the biases and orientation of the treatment.

Although there aren’t many recent scientifically rigorous studies demonstrating whether conversion therapy does or does not change sexual orientation, many studies from the 1970s showed that some individuals who were more bisexual oriented were able to ignore or limit their same-sex attraction. Remember that changing sexual attraction is not the same as changing sexual behavior, or vice versa. Consider prisoners who engage in same-sex sexual behavior while maintaining their heterosexual identity and opposite-sex attraction. Similarly, we can easily point to many homosexually oriented people who marry someone of the opposite sex to conceal their same-sex attractions, until they can no longer repress their behavior and get caught in a compromising public situation.

Close critical reading of reparative therapy treatment programs uncovers a confusion between gender and sexual orientation. Early attempts at reputable institutions endorsed the idea that homosexuality could be cured by reducing feminine traits and emphasizing masculine ones, often under the belief that an “absent father” was a central problem. This approach assumes gay men are feminine and lesbians are masculine, and ignores the many gays and lesbians who bonded with positive same-gender role models and engaged in gender-stereotyped behaviors. Interestingly, one of the key researchers in these gender-based studies was George Rekers, who was photographed in 2010 with a male escort. Rekers was one of the first researchers to investigate feminine and masculine traits among “sissy boys,” and later became active in NARTH and the anti-gay Family Research Council (which the Southern Poverty Law Center labeled a “hate group”).

Some recent media reports illustrate the damages it can take on individuals. Although not scientific studies, they make interesting reading for skeptics concerned about the efficacy of conversion therapy. A CNN investigation focused on the suicide of one of the reformed “sissy” boys in Rekers’ published work, weakening one of the key claims of his research that
such conversion is successful. And in May 2011 the British Association for Counselling and Psychotherapy unanimously found a psychotherapist guilty of professional malpractice for treating a patient for his homosexuality. The Christian Legal Centre defended the therapist, highlighting again the strong connection between reparative therapy and conservative religious beliefs.

Given that the majority of individuals seeking conversion today are, according to the American Psychological Association report, religious white males, there is reasonable concern among mental health advocates to seek affirmative integration of religious, psychological, cultural and sexual issues. But treating people who are religiously conflicted about their sexuality is not a license to practice possibly unethical and scientifically questionable therapy.

As we approach National Coming Out Day on Oct. 11, join me in taking a critical stance on reparative therapies. Let’s use our skeptical skills to ask the right questions about these negative practices and convert them into affirmative ones. Let’s “pray away the homophobia.”

**Dr. Placebo — Half Quack and Half Savant**

The placebo effect’s ability to influence human healing and human behavior is well documented, but we must be careful to make sure this fakery does no harm.

[Cue the drum roll] Ladies and gentlemen, introducing tonight, the magical, the amazing, the astounding, the one, the only [cue the cymbal] — DR. PLACEBO!! Performing sleights of hand that will amaze you, entice you, and lure you into miracle cures that will release you from your hard-earned cash. Come see never-before effects. Well, maybe always-seen effects. Step right this way …

OK, perhaps I’m more cynical than skeptical here, but given the successful selling of sham products such as balance bracelets and homeopathy, it’s important that we learn to think critically about one of the most powerful forces in medical research, the placebo effect.

Much has been written on the placebo effect — and an exciting new take is on the way from Miller-McCune — so our focus here is to critically investigate the role of these fake treatments and beliefs in our daily lives and how to use our skeptical skills in dealing with them. It’s important to realize that even when placebos have a positive impact, the effects can be short-term and end up masking more serious symptoms, preventing people from seeking reliable and effective treatments.

Simply stated, a placebo (Latin for “I will please”) is a substance or procedure given to a control group when used in scientific research designs to compare with an equivalent group receiving the real treatment or pill. In medical research, the look-alike treatment is often a sugar pill that does not have any real effect on the illness, allowing comparisons to be made between the actual medicine and the fake one.

It’s fairly common that about a third of people in the control group receiving the placebo report positive changes or lessening of symptoms. Sometimes recipients of the placebo claim negative side-effects (the “nocebo” effect), such as headaches or nausea. Surprisingly, some patients say they have positive outcomes even when told outright that they were receiving a fake treatment!

The power of the mind and its psychological impact has been a common explanation for how the placebo effect works. But continuing research also points to important physiological and neurological brain changes with placebo treatments. Indeed, with real treatment and medicines, some part of the cure can be attributed to patients’ expectations that the substance is working. Recent evidence suggests that placebo medicines are showing more effectiveness that the real pills, again illustrating some powerful physiological responses of patients to social, psychological, and biological expectations.
Headache relief seems to attract lots of placebo products, including one that simply required rolling on a wax-type substance and another by slowly moving a red light across your forehead. The red light should instead remind you to stop with these treatments and save your money, since in most cases, headaches will go away on their own with time and relaxation. Consider too some non-medical situations where the mind has power over the reality. We know, for example, that people will often claim they are not as full after eating food labeled as healthy or low-fat, compared with foods labeled as an “indulgence” or high in calories. Here the placebo principles can result in people eating more unhealthy foods when they are not satisfied after finishing their better-for-you foods.

In an unusual study from New Zealand, university students who were told they were drinking vodka and tonic, but were really sipping a tonic-only placebo, not only acted drunk but also demonstrated worse eyewitness accounts and were more easily swayed by misleading information. Perhaps they would be willing to buy some fake red light treatment for their fake hangover and fake headaches!

Pricing can also have an impact on placebos, as Dan Ariely illustrated in Predictably Irrational. Researchers sold some students at a university gym a caffeinated soft drink at full price and another group bought it at a two-thirds discount. After finishing the beverage, and because of the caffeine, all students said they felt less tired after their workout. However, the group paying the higher price reported less fatigue than the discounted price group, even though they bought the exact same product. When tested with a problem set of anagrams to solve, those students who paid full price for the caffeine drink performed 28 percent better than the group who paid a discount for the drink. And all students performed even better when told the ads for the drink emphasized scientific studies showing the product improved mental functioning. Even in this experimental situation, the full-price group continued to outperform the students who received the discounted price.

Dr. Placebo, you’re amazing. Not only do you have power over fake medical treatments, you enhance the effect of real medicines, you contribute to our experiences when imbibing alcohol-based and caffeinated drinks, and you help people believe advertisers’ hype.

But do us critical thinkers a favor: because your name is a Latin word, remember the other Latin phrase that guides medical ethics and skeptical inquiry: Primum non nocere, “First, do no harm.” Save your effects and tricks for when it is helping people to feel better and to act more responsibly.

Full Moon Myths Leave Skeptics Howling

Full moons appeal to our imaginations and contribute to our mythologies, but ascribing too much power to them appears to be a continuing form of lunacy.

A stock image of the holiday season is a night scene of Santa and his reindeers silhouetted across a full moon, his sleigh packed with presents ready to be delivered throughout the evening. While this joyous image fits some of our romantic notions of being moonstruck, it contradicts some widely held beliefs about the negative effects of full moons. (And never mind that the odds of experiencing a full moon on Christmas Eve itself are very small: the last one was in 2007 and the next may not appear until 2026.)

A teacher I know, complaining about her students’ boisterous behavior in the classroom, quipped that there must have been a full moon, while tales of rising crimes and emergency room visits during a full moon are common.

Let’s take a look at some of these myths — and don’t forget to bring along your healthy skepticism. Perhaps a good place to start is “Twilight,” so to speak.
At least as far back as ancient Roman and Greek mythology, stories of lycanthropy – the ability of a human to transform into an animal – speak of the role of a full moon in creating werewolves. Given what we now know about the effect of the moon’s force on many aspects of life, such beliefs are understandable. Consider tides and the motion of the Earth in relation to the moon’s gravitational pull. Or the monthly menstrual cycle that some associated with the moon’s cycle: the words “menstruation” and “menses” are based on the Latin word for “month” (mensis) and derived from the Greek “mene,” a female divinity who presided over the months.

A key word that points to some of our contemporary myths: lunatic, derived from the Latin lunaticus. Clearly the lunar connection is evident here; even Aristotle and Pliny the Elder held to the belief that, due to the moisture in the brain and the tidal effects on water, the moon created insanity in many people. Superstitions also make good use of a full moon. Blowing on a wart nine times in the light of a full moon and placing a knotted string over your shoulder when the moon is full are folk remedies for removing warts. Or maybe just for removing our critical thinking skills!

But a long history of associations with a full moon does not explain our contemporary beliefs in today’s more scientific age. One of the most persistent myths, held even by health care professionals and police officers, is the connection between a full moon and increases in crimes, aggressive behavior, and trauma.

Stories of emergency rooms reaching higher caseloads on full moon nights are common, along with increases in arrests for crimes and assaults. It’s even said that dogs and cats have higher incidences of illness and injury during a full moon. An obvious way to critically investigate these beliefs is to look at the numbers on emergency rooms and police reports. About 15 years ago, researchers reviewed more than 100 studies on lunar effects and concluded there was no reliable correlation between a full moon and such outcomes as epilepsy, domestic violence, homicides, or psychiatric admissions. Or even lycanthropy.

Nor has the new millennia changed the moon’s power. A more recent study from India found no difference in the number of crimes reported on full moon days compared with non-full moon days.

One explanation for the persistence of the myth of increased crime on full moon days has to do with the amount of light available. Crimes do increase as sunset is delayed, according to another study, yet there was no statistical correlation between lunar cycles and incidents of crime.

In days before outdoor lighting, full moons provided more light to carry on night time activities; people sleep less when it’s brighter, giving people more opportunities to stay outdoors and possibly leading to more injuries, assaults, and other increased activities, including time spent with pets. But our explanations demonstrate the common problem of mixing causation with correlation and the power of post hoc explanations: the problematic behaviors witnessed must have been caused by the full moon, or so we say post hoc, after the fact.

Selective attention also plays a part in our recollection of events. Attentive to our beliefs in many of these myths, we selectively notice, on full moon nights, stories about crimes, students acting out in class, and other undesirable events. Do we remember the good things that happened that day or the romantic stroll under a full moon? Do we compare how many assaults or misbehaviors occurred a few days before when the moon was not full? And do crimes and injuries increase when the moon is full and it’s too cloudy to notice it?

Although this year you won’t be seeing Santa and his team of reindeers flying across a full moon, when people insist they experienced strange effects, had warts disappear, and witnessed unusually high incidences of injurious activities or a bit of excessive facial hair growth when the moon was full, just give out a hearty “ho, ho, ho.”
Numerology Doesn’t Know the Score

Various ways of assigning numbers to events, people, and actions is an ancient parlor game, but let’s not take it beyond that.

We entered the new year with all sorts of expectations and excitement, but I’m sure none compared to the chills from realizing 2012 will see the last major numerical date event — using the Gregorian calendar — for almost another century: December 12, 2012 — better represented as 12/12/12.

I know, just a few months ago, we achieved 11/11/11. But not until 2101 will we be able to write 01/01/01, just as we did on that numerically glorious day of January 1, 2001. Disappointing I know, but should we celebrate or cower? Is this the end of the world, as the Mayans sort-of predicted? No, wait … that apocalyptic date is 12/21/12. Oooh, look at the similarity in dates: 21 is 12 backwards. Spooky.

Can there really be meaning in these figures and coincidences? The new year is as good a time as any to make the resolution that you will direct your critical thinking skills and skepticism to help humankind and save us all from manipulating numbers to serve preconceived ideas. Let’s take a critical look at numerology and the many ways people create patterns where none exist.

Consider the events of 9/11. Such tragedies bring out conspiracy theorists in droves, even 10 years later. Among the various myths and conspiracies, the coincidence of numbers intrigues even the more skeptical among us. The number 11 plays a significant part in the World Trade Center disaster: it’s the number of letters in New York City, Afghanistan, and George W. Bush. Add up the digits 9-1-1. Flight 11 was the first to hit the towers with 92 passengers and crew (9 + 2, of course). The WTC building was shaped like the number 11 and New York State was the 11th member of the United States. September 11 is the 254th day of the year — add up those digits! (So is it any sillier to note we’ve reached 2012, 11 years since 2001! Coincidence or not?)

Let us skeptics ask the 9/11 numerologists why they didn’t count the letters in George Bush or Osama Bin Laden, or add the number of feet the towers were (1,362 and 1,368)?

Belief about mystical connections between numbers and physical objects is the cornerstone of numerology. Symbolic and mystical associations with numerals have a long history traceable to Egyptian, Babylonian, Indian, Hebrew, and Chinese cultures. Perhaps it was Pythagoras, of triangle fame, who most contributed to our seeing numbers as symbols, even if he didn’t invent what contemporary numerology has become.

Simply put, every letter of the alphabet is assigned a numerical value (such as a, j, s = 1, or h, q, z = 8). Sort of like playing Scrabble, you just have to learn the points for each letter. First you add up the numbers continuously until a single digit is achieved. With my first name, Peter = 7+5+2+5+9 = 28. Then, you add up those digits, 2+8=10. One more addition, and I get the single digit of one. This is when you use our base-10 system of counting and the Pythagorean table. Another figure is derived when you check the eight-number Chaldean table, and in this case Peter = 24, and then 6.

So am I a one or a six? Tough call, but in either instance I’d look up some interpretation of the number, which essentially reads like a horoscope. And like horoscopes, we selectively interpret the results that suit our already-held beliefs or desired traits. It’s the Forer effect once again, where people tend to agree with positive statements about themselves even if it’s otherwise objectively incorrect or applicable to just about anyone.

Maybe I should be adding up the numbers in my birth date instead. Or my last name. Or my telephone number. You get the point. We also selectively decide which numbers to choose and how to manipulate them.
While some of this may seem like a parlor game, many people do take numbers seriously. Some are already predicting an apocalyptic 2012 filled with earthquakes because of the numbers and order of the digits. Triskaidekaphobia is evident in many hotels where there is no 13th floor. In some Southeast Asian cultures, the number four gets that treatment while eight signifies good luck and prosperity. Wedding dates and other important events are scheduled in Chinese society based on numerical beliefs. Throughout our lives, we brag about or downplay our SAT scores, cholesterol numbers, and our car’s MPG. Numbers take on meaning and power, and can impact our sense of self and how we act.

Selectively interpreting numerology readings can sometimes lead to disastrous results. Take General Ne Win of Burma. Relying on astrologers and numerologists for policy advice, in September 1987 the military head of state introduced 45 and 90 kyat currency notes to replace the 50 and 100 kyat notes in wide circulation. Not only did the new digits on the bills add up to 9, but 45 and 90 are products of the number 9. Alas, the change in currency may have led to economic turmoil and the collapse of middle-class savings and purchasing power, and the United Nations named Burma the world’s least developed country that December.

So, remember that this new year of 2012, which adds up to 5, represents balance, health, and love. Unless, that is, you read another chart, employ your critical thinking skills, and find it means something else entirely. In any case, have a great new year. High fives to all!

Presidents’ Day: Just Another Presidential Fable

A number of folk stories and a few divisive rumors have surrounded the office of the U.S. presidency, and skeptical folks like us check a few of them out.

In the United States, February brings “Presidents’ Day” and some familiar stories, such as George Washington chopping down ye olde cherry tree, circulate anew. Sweet as it may sound about not lying to one’s father, this story is not true. Nor, to bite into a story of more recent vintage, did he have wooden teeth.

Let’s skeptically consider a few of the many fables that regularly appear about current and past presidents, and critically think about the purposes they may serve.

First, we need to address the initial fable of a “Presidents’ Day.” Yes, Martha, there is no such legal designation. Once upon a time there were two presidential holidays in February: Lincoln’s Birthday on the 12th and Washington’s on the 22nd. (Never mind that Washington was actually born on the 11th, based on the Julian calendar in effect in 1731. When Britain adopted the Gregorian calendar 21 years later, George’s b-day jumped almost a year to February 22, 1732. That’s some rejiggering for a Monday holiday.) Beginning in the late 1800s, Washington’s birthday became a federal holiday. Lincoln’s birthday was a legal holiday in a few states, and never an official federal holiday.

Then, as one of several holidays changed by the 1968 Uniform Monday Holiday Bill, Washington’s Birthday was officially moved to the third Monday in February in 1971 to guarantee federal employees a three-day weekend. Alas, poor George would no longer be associated with the 22nd — the third Monday can never occur after February 21.

Legally, the third Monday of February remains Washington’s Birthday. The so-called “Presidents’ Day” appears to be as much a marketing gimmick for special holiday sales as anything else, although there have been attempts to make it an official observance honoring all U.S. presidents. Grammarians may have already achieved that, though: Is it Presidents’, President’s, or Presidents Day? The apostrophe could indicate your preference for a holiday recognizing one or many leaders, or show the slow decline in our knowledge of proper punctuation, as the Apostrophe Protection Society argues.
Now that we’ve revealed “Presidents’ Day” as a myth, let’s return to our native-born skepticism and chop down some other whoppers.

Brief, yet powerful, the 272 words of the Gettysburg Address may have taken only minutes to read, so a common story has it that Abraham Lincoln jotted it down on the back of an envelope on the train to Gettysburg. But Lincoln was also known as a thoughtful speaker who it is now said wrote it the night before and not hastily on an envelope.

For baseball lovers, the story of the creation of the seventh-inning stretch is often attributed to President William Howard Taft. Supposedly the tall, heavy man (at 300 pounds he does hold the record for the heaviest president) felt very uncomfortable in the narrow stadium seats, and when he rose to take a break during the seventh inning, the spectators also stood up, believing he was about to leave. Although Taft is responsible for creating the traditional presidential opening day first pitch in 1910, the seventh-inning tale is, ahem, a bit of a stretch. Even though it is difficult to provide the actual origin of the stretch, historians trace the custom to an 1869 manuscript that describes the rest break.

Now consider something bequeathed by William Henry Harrison: the Curse of Tippecanoe. Sometimes called Tecumseh’s Curse for the Indian chief whom Harrison defeated at the Battle of Tippecanoe, it claims that presidents elected in a year ending in a zero would die in office: Harrison, Lincoln, Garfield, McKinley, Harding, Franklin D. Roosevelt, Kennedy. (The only other president to die in office, Zachary Taylor, was not elected in a zero year.)

The streak ended with Reagan, who did survive being shot while in office, and the waiver was renewed with George W. Bush, who also survived a rather serious assassination attempt.

President Barack Obama’s election brought out numerous rumors about his alleged Muslim roots and false birth certificate that continue today. One study revealed that 91 percent of the public had heard the Muslim stories. In 2008, the fact-checking website Politifact.org concluded that the stories of Obama being a covert Muslim were “so wrong.”

Stories about Obama’s birth certificate also led another neutral investigative site, FactCheck.org, to conclude that “Obama was born in the U.S.A. just as he has always said.” (FactCheck is a project of the University of Pennsylvania’s Annenberg Public Policy Center, which is directed by Kathleen Hall Jamieson, who also sits on Miller-McCune’s editorial advisory board.)

As these stories about the present president demonstrate, the Internet contributes to the rapid and diffuse circulation of stories and myths. Yet, the effect of online exposure on credulity is minimal, according to a study by R. Kelly Garrett at Ohio State University, although what does seem to matter are e-mails circulated among friends and family that not only are believed more but also reflect strong political biases. And other research by Brendan Nyhan and Jason Reifler demonstrates that trying to correct political misperceptions regularly fails to reduce false stories among targeted ideological groups and occasionally ends up increasing the misperceptions. Put another way, even new and perhaps more trustworthy information often fails to change our minds.

So let’s celebrate and honor our presidents, slice up that cherry pie, toss out a baseball, and jot down some profound lines on the back of your Kenyan birth certificate. And don’t forget to e-mail this column to your close friends and family!

Linguistic Myths and Adventures in Etymology

The folk wisdom built up around common English expressions is often wrong, but it can be fun ferreting out the real origins.

The alarm went off. What does that mean? Recently, a friend who is learning English couldn’t quite figure it out. Isn’t the alarm going on, not off, he asked.
Comprehending such phrases is often one of the more difficult steps in learning a language. These idiomatic expressions are collections of words that mean something different than each word’s dictionary definition. For example, “that barking dog next door is driving me up the wall,” if taken literally, could mean that the neighbor’s poodle has recently earned a driver’s license and is using a car to accelerate up the wall dividing our houses. “Woof, woof” could equal “Vroom, vroom.”

But how well do native speakers know their own language? Let’s have fun with our critical thinking skills and apply a little skepticism to some widely believed verbal urban legends.

David Wilton, author of *Word Myths* and webmaster at [Wordorigins.org](http://www.wordorigins.org), coined the concept of “linguistic urban legends,” which tend to be false tales, yet which spring from some grain of truth. These expressions, Wilton claims, “arise mysteriously and spread widely.”

**OK?** Consider OK. Stories of its origin range all over the map: a Haitian rum port called *Aux Cayes*, a Choctaw word, *okeh*, meaning “indeed,” or President Martin van Buren’s nickname of Old Kinderhook. Writer (and noted skeptic) H.L. Mencken got into the act in 1921 when he debunked the popular belief floating around in 1828 that OK was short-hand for “all correct” because of Andrew Jackson’s abbreviations on documents and his misspelling as “*oll korrect.*”

That last one about Jackson is *close but no cigar*. It is now generally accepted that the original use of OK came about in 1839 as part of newspaper fads to humorously abbreviate phrases, including funny misspellings from supposedly illiterate characters. So some would use GTDHD for “give the devil his due” for a more literal acronym, and OK for a misspelled “oll korrect.” By now, I wouldn’t be surprised if you were LOL or ROTFL over this silly 19th-century fad! OMG, who’d do that these days?

Or maybe you’re too *posh* to play along this way. Another widely held linguistic urban legend claims “posh” was an abbreviation for “port out, starboard home” stamped on tickets to designate the shadier and more luxurious sides of the ship when traveling between England and India. Yet, no tickets have been uncovered with “POSH” stamped on them, and evidence exists from the late 19th century of the use of the word posh in a similar way as it is used today. While its exact source is unknown, posh may derive from a Romani or an Urdu word, referring variously to money, a dandy, well-dressed, affluent. Phrases like “port out, starboard home” to define the word posh are sometimes called “backronyms” as we work backwards from the letters to an invented phrase and end up creating what appears to be an original acronym.

Lacking historical perspective can lead us to overlook that there may be nothing new under the sun. Not only were humorous abbreviations used centuries before Twitter, but another computer-related word may not be as new as you think. Let’s hope that your choice of platform to read this article is not infected with a bug. While it is generally believed that an actual insect jammed some relay switches in an earlier version of the computer and the word spread throughout the industry, the Oxford English Dictionary traces the word to Thomas Edison in 1889 using it metaphorically to indicate a difficulty with his new phonograph invention and blaming the glitch on some imaginary bug.

Successfully finding the source of many of our idiomatic expressions sometimes has a *snowball’s chance in hell*. Many are passed along orally, and no written record exists. Yet, sometimes, good critical thinking and skeptical analysis can uncover the linguistic rumor.

One famous example is the alleged multiple words for snow that Eskimos use. Noted anthropologist and linguist Franz Boas, discussed the Inuit’s four — only four — words for snow in 1911.
However, by 1940, thanks to Benjamin Lee Whorf of Sapir-Whorf Hypothesis fame, the original point of Boas’ linguistic observation got transformed into the idea that Eskimos actually see snow in multiple ways and categorize the world differently. Whorf, in one of his writings, increased Boas’ examples to at least seven, according to research in 1989 by linguist Geoffrey Pullum. Pullum argues that “the myth of the multiple words for snow is based on almost nothing at all. It is a kind of accidentally developed hoax....”

This seemingly provocative notion of many words and perceptions of the Eskimos’ world, well, snowballed. Anthropologist Laura Martin provided many examples in her 1986 published research about the Eskimo snow hoax, such as the Lanford Wilson play, The Fifth of July, which said there were 50 Eskimo words for snow, a New York Times editorial in 1984 that claimed there were 100 types of snow, and a Cleveland television station that reported the existence of 200 words while discussing the local snow storm. Discovering the meanings behind our idiomatic expressions, linguistic hoaxes, and proverbs illustrates the fun side of skeptical thinking. So join in and when that alarm comes on (or goes off), wake up and smell the coffee.

Mass Hysteria: From Dance Floors to Factory Floors

Throughout the years, people’s minds have played tricks on them, but oftentimes their bodies react for real.

By Peter M. Nardi

Do you have an uncontrollable desire to jump up and dance while watching “Dancing with the Stars”? Perhaps it’s not the music and excitement, but tarantism. In the 17th century, this urge to engage in a frenzied whirling dance, accompanied by nervous bouts of melancholy and hysteria, spread widely in southern Italy. The syndrome’s name comes from an energetic dance, the tarantella, a supposed cure for the venomous bite of a tarantula.

The officially dubbed “tarantism” followed a 1518 outbreak when a woman danced for days in the streets of Strasbourg. Before long, dozens of others joined in, and within a month, this frenetic dance plague spread among hundreds of people and resulted in many deaths. To exorcise the demons thought to be causing this mass hysteria, people prayed to St. Vitus, now the patron saint of dancers. And in his honor, St. Vitus Dance became the popular name for a nervous system twitching disorder doctors know as Sydenham chorea.

What’s of interest to skeptical and critical thinkers is how such symptoms and behaviors spread like a contagion without any biological or viral sources. Lest we think these manias are relegated to medieval times, consider events in LeRoy, New York. In November 2011, six teenage girls at the local high school reported waking up with mysterious Tourette-like (or perhaps tarantist-like) symptoms of shaking, verbal tics, and twitching. By February 2012, 18 girls claimed similar symptoms. Explanations reflected people’s personal anxieties: ticks spreading Lyme disease, HPV vaccinations, fracking, and pediatric autoimmune neuropsychiatric disorders associated with streptococcal infections. Speculation concerning possibly polluted air and water even led Erin Brockovich to investigate decades-old toxic chemical spill.

Not everyone cited their favorite bugaboo; others focused on mass psychogenic illness — mass hysteria — sometimes called “conversion disorder.” The Mayo Clinic explains conversion disorder as “a condition in which you show psychological stress in physical ways. The condition was so named to describe a health problem that starts as a mental or emotional crisis — a scary or stressful incident of some kind — and converts to a physical problem.”

New Zealand sociologist Robert Bartholomew has written extensively on mass hysteria in his books, such as Hoaxes, Myths, and Mania (co-authored with Benjamin Radford), which are packed with examples, such as reactions to Orson Welles’ infamous 1938 War of the Worlds radio broadcast, which included people sensing the heat from the Martian rays, choking
from the gas emanating from the spaceships, and seeing flames from the fires set by the invaders. In 1944, residents of a small town in Illinois experienced nausea, burning lips, dizziness, and headaches after one woman smelled gas from a “mad gasser” supposedly stalking the area.

Recent bouts of conversion disorder are not limited to the U.S. In 2009, more than 1,200 workers in a Chinese factory went to emergency rooms vomiting, nauseous, and dizzy and believing it was from toxic fumes at a nearby chemical plant. Such physical symptoms are no laughing matter — although sometimes they are. In 1962, three teenage girls in the village of Kashasha (in what is today Tanzania) started laughing for hours, and soon days, on end. Before long, laughing spread around the school and to other schools in nearby villages. Many were forced to close. Rashes, respiratory problems, and fainting often accompanied the laughing.

Mass hysteria events have similar patterns: physical symptoms can be debilitating and are certainly real, even if the causes may not be. Workplaces, schools, and other confined places help spread the symptoms, and anxieties and stressful situations clearly remain a key source. One puzzling pattern is the disproportionate prevalence of conversion disorders among women, from the Salem witch trials to Beatlemania. We are mindful that women writers have pointed out how medical doctors often disregard women’s health symptoms as “just” hysteria; the word itself is based on the Greek word for “womb” and links behavior with disturbances in the uterus. Yet, we must critically think about how our cultures contribute to stress among teenage girls and examine what the outlets are for dealing with their anxieties, especially in comparison to boys.

Over time, the symptoms usually subside and the treatments – counseling, prescription medications, physical therapy – can be effective. There are also some innovative cures. Writing in Slate, Ruth Graham tells the story of a 1789 textile factory in England. As a joke, a woman put a mouse down the dress of a fellow worker who went into a convulsion. A rumor spread that imported cotton had caused the convulsion, and 24 people began violent seizures and had to be restrained. The suggested treatment was to “take a cheerful glass and join in a dance.” They danced and the next day most returned to work.

Anyone up for a tarantella?