

Zombie Ideas

September 25, 2019



Our topic for this month is ... zombies. Not the charmingly decayed corpses you encounter in movies and books, but *zombie ideas*. According to the economist Paul Krugman (2013), a zombie idea is a view that's been thoroughly refuted by a mountain of empirical evidence but nonetheless refuses to die, being continually reanimated by our deeply held beliefs.

Zombie ideas abound in our culture, nibbling away at the brains of their victims. The mistaken belief that vaccinations cause autism — a celebrated zombie idea — is responsible for rising rates of vaccine-preventable diseases. The belief that a person's personality type, assessed by the Myers-Briggs Type Indicator (MBTI), predicts job performance is another zombie idea that continues to lure otherwise capable managers into making decisions that benefit neither employees nor their companies.

If you think that formal science training will zombie-proof your mind, you're out of luck, my friend. Hordes of zombie ideas flourish in science (Brockman, 2015). They also fester in our own field, quietly biding their time in peer-reviewed papers and textbooks, waiting to infect another generation of unsuspecting psychological scientists.

For example, evolutionary psychologists have argued for years that waist-to-hip ratio is a phenotypic cue to reproductive success. I've always felt there should be a special place in hell, filled with mirrors,

reserved for people who suggest that waist or hip size predicts anything important about a woman! But I'd heard this claim repeated enough times that I assumed the empirical case was a done deal. The logic goes like this: Men supposedly prefer women with relatively smaller waists and broader hips, which supposedly aids conception and childbirth and, in turn, increase the males' reproductive success. Nevertheless, there is no evidence that healthy women with larger waist-to-hip ratios are less fecund or fertile than women with smaller ratios (Bovet, 2019). It's a zombie idea. Ditto for the "*body symmetry*" hypothesis, which survives despite the empirical evidence (Jennions & Møller, 2002; for cogent analysis, see Prum, 2017).

In honor of the first MetaScience symposium, exploring the science of doing science, I asked the APS staff to canvas APS members for zombie idea sightings. Alison Gopnik, a developmental psychologist, nominated "the nature/nurture distinction" as an undead idea that will not expire. "It's commonplace in both scientific and popular writing to talk about innate human traits, 'hard-wired' behaviors or 'genes for' everything from alcoholism to intelligence," writes Gopnik, in an aspirational obituary (Gopnik, 2015). She points to growing evidence, including the research of neurologist Michael Meaney, for the many complex ways that environmental factors govern gene expression and protein construction (i.e., epigenetics). There is also increasing evidence that certain genes tune, for better or for worse, the extent to which a person's genes are sensitive to environmental impacts (so-called orchids vs. dandelions; for a review of evidence and discussion, see Boyce, 2019). And developmental neuroscience evidence clearly shows that infant brains wire themselves to their physical and social surroundings. These findings show that nature requires nurture, and nurture has its impact via nature. The two are biologically entwined and cannot be discussed in either-or terms or as independent factors that interact.

Joshua Buckholtz, a clinical neuroscientist, nominated the "hydraulic model of self-control," the idea that within each of us lurks ancient brain circuits that, when triggered, cause us to do stuff that we later regret (more colorfully referred to as the four Fs — fighting, fleeing, feeding, and . . . sex). Our prodigious prefrontal cortex allegedly puts the brakes on our inner beast, protecting us from worst selves, and impaired self-control in psychological disorders is thought to result from a faulty brake. Buckholtz points out that this idea should have remained buried by mountains of neuroanatomy evidence showing that the relevant brain circuitry is not structured in a way that makes the hydraulic model plausible (e.g., Haber, Kim, Mailly, & Calzavara, 2006; Bilder, Volavka, Lachman, & Grace, 2004), not to mention the accumulating evidence that self-control, in and of itself, is a value-based choice (Berkman, Hutcherson, Livingston, Kahn, & Inzlicht, 2017; Buckholtz, 2015).

The hydraulic model of self-control is a close cousin to another zombie, the *triune brain*, the idea that evolution laid down brain circuitry like sedimentary rock, with reptilian, limbic, and neurocortical layers. It has been known since the 1970s in evolutionary and developmental neuroscience that this story is a myth (Striedter, 2005). Think about this the next time you read that emotions erupt from neurons in the amygdala and other parts of the fabled limbic system, or that rational thought emerges in the neocortex, with one struggling to regulate the other.

Here's a shocker from APS Fellow Sari van Anders, social neuroendocrinologist: It's time to bury the idea that "male" and "female" are genetically fixed, nonoverlapping categories (i.e., natural kinds). Evidence from numerous disciplines fundamentally disconfirms this common-sense view (Hyde, Bigler, Joel, Tate, & van Anders, 2019). For example, a variety of neuroscience findings refute sexual dimorphism of the human brain. Behavioral neuroendocrinology findings similarly challenge the notion

that male and female are natural kind categories. Research from developmental and cultural psychology also suggests that our view of these biological categories as fixed and immutable is learned, malleable, and culturally variable. (For additional evidence and cogent analysis, see Dreger, 2000, 2015; Fine, 2010, 2014).

Our final example of a dead idea that continues to roam the psychological landscape is that people can read emotions in other people's faces, because certain configurations of facial movements, commonly called "facial expressions," reliably and specifically signal a specific emotional state. A team of five senior scientists (including myself) met weekly for over 2 years, reviewing more than 1,000 publications related to this topic. We began with starkly different priors, but nonetheless came to consensus over what the data show, and we published our conclusions in the July 2019 issue of *Psychological Science in the Public Interest* (Barrett, Adolphs, Marsella, Martinez, & Pollak, 2019). People do, indeed, spontaneously smile in happiness, frown in sadness, scowl in anger, and so on, more than would be expected by chance, but not with sufficient reliability or specificity across contexts, individuals, and cultures for these facial configurations to be considered prototypic displays of any emotional state.^[1] Nor do human perceivers infer emotions from particular configurations of facial muscle movements in a reliable and specific way (once certain methodological factors are considered and controlled). For example, a wide-eyed gasping face is not *the* facial expression of fear but is *one of many* configurations that can express fear, and frequently does not express fear at all. Human facial movements are much more variable than previously assumed, and the effects of context and culture have been insufficiently documented and accounted for in published experiments. Have your zombie detector ready the next time you encounter terms like "emotional displays" to refer to how people move their faces when they are emotional and "emotion recognition" to refer to how people infer the emotional meaning in facial movements.

To kill a zombie, you generally lop off its head or destroy its brain in some permanent way. Luckily, you don't have to decapitate yourself to stop zombie ideas from eating your brain or infecting other psychological scientists. Instead, deploy the most powerful anti-zombie vaccine: curiosity (Firestein, 2012, 2015). Be curious about evidence that seems to disconfirm your strongly held hypotheses. Being wrong is an opportunity to discover something new.

So this October, be brave: Take a deeply held belief and put it to the test. Search for empirical evidence that it might be wrong. Seriously entertain at least one alternative hypothesis during your hunt. If you do, you might just uncover a zombie infestation.

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^[1] This evidence largely comes from people living in larger scale, urban cultural contexts; there are no peer-reviewed, published studies that systematically observe spontaneous facial movements during emotional events of people from small-scale, remote cultures.