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Bill Sullivan Ph.D.
Pleased to Meet Me

The Truth about Lying and What It Does to the Body

Dishonesty can take a toll on the body and mind.

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(This is a spoiler-free article about an unusual medical condition seen in the movie Knives Out.)

In the hit film [Knives Out](#), Detective Benoit Blanc is hired to investigate the mysterious death of a wealthy novelist named Harlan Thrombey. Blanc questions the members of Thrombey's eccentric family and his nurse, Marta Cabrera. When Marta admitted, "Just the thought of lying makes me puke," she was not kidding. Marta is like Pinocchio, but instead of lies elongating her nose, they make her vomit. Marta's strange reflex is a dream for a private investigator trying to uncover the truth, but could such a biological anomaly actually exist off the movie screen?

What happens to the body when we lie?

We tell lies all the time. A 2002 study performed by psychologist Robert Feldman at the University of Massachusetts found that [60 percent of people lied at least once during a 10-minute conversation](#), telling an average of two to three lies. The tendency to lie is deeply rooted in our evolutionary history, as other primates have been observed to cheat and [deceive](#). [Human children pick up this crafty behavior between the ages of two and five, and it is seen by some psychologists as a milestone of cognitive growth](#).

Many lies are trivial and are told simply to keep the peace or make someone feel good. Examples include niceties such as "You can't tell that you're wearing a toupee!" or "The turkey doesn't taste dry to me!" But more sinister lies, such as falsely accusing someone of a [crime](#) or lying to investors, can have devastating consequences. Dishonesty puts the brain in a state of heightened alert, and this stress increases with the magnitude of the lie.

Why does the brain care about honesty? As social animals, our reputation is paramount. Consequently, most people work very hard to maintain an image of trustworthiness and integrity. Knowing that dishonesty risks irrevocable damage to one's reputation, lying is an inherently [stressful](#) activity. When we engage in deceit, our respiratory and heart rates increase, we start to sweat, our mouth goes dry, and our voice can shake. Some of these physiological effects form the basis of the classic lie-detector (polygraph) test.

People vary in their ability to tell a lie due, in part, to differences in the brain. To take an extreme example, sociopaths lack [empathy](#) and therefore do not exhibit a typical physiological response when lying. Liars can also pass a polygraph if trained to stay calm during the test. Similarly, innocent people may fail the test merely because they are [anxious](#) about being hooked up to the intimidating equipment. For these reasons, the [accuracy of polygraph testing is heavily contested](#).

In contrast, brain imaging studies are proving to be much more informative for learning about the body's response to lying. Symptoms of anxiety arise because lying activates the limbic system in the brain, the same area that initiates the "fight or flight" response that is triggered during other stresses. When people are being honest, this area of the brain shows minimal activity. But when telling a lie, it lights up like a fireworks display. An

gastroenterologist Kara Gross Margolis of the Columbia University Medical Center stated that [she has never seen a patient that suffers from chronic vomiting after lying](#). Nor has David A. Johnson, a gastroenterologist at Eastern Virginia Medical School. [Speaking to Slate](#), Johnson said, "Never, at least in my 42 years of experience, has it [chronic vomiting] been brought up that it was specifically around a lie."

However, both experts mention the so-called gut-brain axis as a plausible mechanism behind a regurgitative reflex. The gut-brain axis refers to the two-way communication that takes place between these two bodily systems, explaining why we sometimes get butterflies in our stomach when nervous. Kara Gross Margolis admits that "significant anxiety can lead to nausea and vomiting," opening the door for such a condition to exist in someone who is constantly worried.

In addition to short-term stress and discomfort, living a dishonest life would seem to take a toll on health. [According to a 2015 review article](#), constant lying is associated with an array of negative health outcomes including high blood pressure, increased heart rate, vasoconstriction, and elevated stress [hormones](#) in the blood.

Other studies suggest that long-term effects could be minimal since it appears that we get more comfortable with lying the more we do it. In other words, we develop an unsettling tolerance to being devious. Brain imaging experiments conducted by Tali Sharot at University College London show that [the brain adapts to dishonest behavior](#). Participants showed reduced activity in their limbic system as they told more lies, supporting the idea that each lie makes lying easier. In addition, the findings support the adage that [small acts of dishonesty can escalate into larger ones](#). If true, Marta's tendency to vomit after lying could diminish over time as her brain adapts to being dishonest.

If our brain can cozy up to lying with enough practice, it would explain society's disdain for dishonesty and why people hesitate to give liars a second chance. These strong social rules and the penalties that come from breaking them might be what really keeps us honest at the end of the day.



About the Author



Bill Sullivan, Ph.D., is the author of *Pleased to Meet Me: Genes, Germs, and the Curious Forces That Make Us Who We Are* and a professor at the Indiana University School of Medicine.

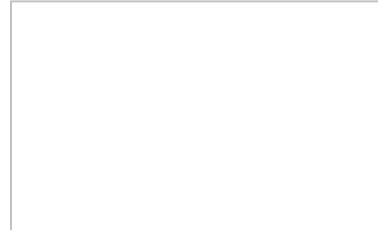
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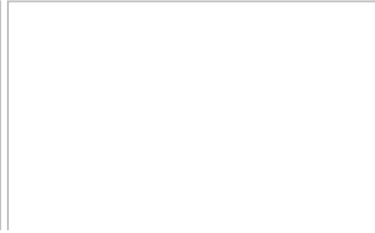
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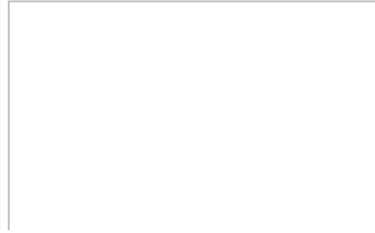
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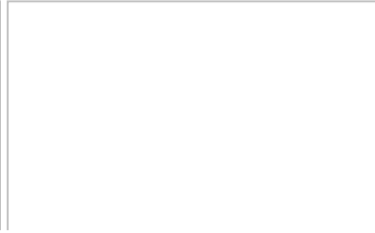
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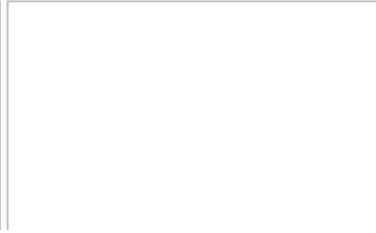
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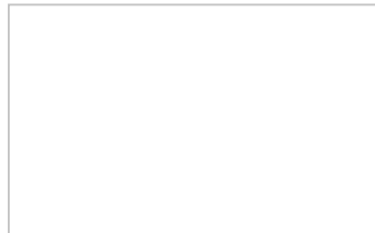
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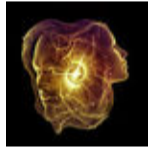
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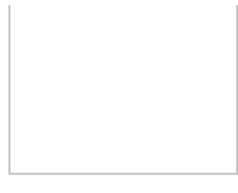
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