

## The Deceptive Nature of Intuition

A review of



**The Invisible Gorilla: And Other Ways Our Intuitions Deceive Us**

by Christopher Chabris and Daniel Simons

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Reviewed by

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Christopher Chabris and Daniel Simons have written a cautionary tale of human error, at times a comedy, often a tragedy. Their tale begins with a simple, now famous, experiment. If you are not familiar with it, go to their website, <http://www.theinvisiblegorilla.com/videos.html>, and return to this review when you have completed the first selective attention test.

You have seen a test of your ability to perform an apparently straightforward perceptual task. You must count the number of passes made by a team of basketball players. It's not too difficult, but after 12 seconds a gorilla (well, a woman dressed in a gorilla suit) enters stage left, turns to face the camera, beats its chest, and ambles off stage right. Roughly half of those who perform the counting task fail to see the gorilla.

How can someone miss an event that is so obvious to anyone who passively watches the video? The answer, of course, is that making complex perceptual discriminations

depends on our ignoring irrelevant events. We are aware of our ability to make discriminations; the task may even seem easy. But we are not aware of the price we pay for that ability. We do not see the invisible gorilla, and it is hard to believe that we could make such a mistake.

Can one write an entire book around a single demonstration, no matter how memorable it may be? Chabris and Simons use the demonstration to develop a broader message in *The Invisible Gorilla: And Other Ways Our Intuitions Deceive Us*: Our lives are subject to everyday illusions of which we are usually unaware and which can often have serious consequences. They describe these illusions and document them by reference to anecdotes and research. They show how the illusions can produce serious errors in our unaided, intuitive judgments of events in the world around us.

## Everyday Illusions

The term *illusion* is used deliberately, because these phenomena have much in common with the visual illusions familiar to all of us. No matter how often we look at, say, the Müller-Lyer illusion (see, e.g., [http://www.newworldencyclopedia.org/entry/Muller-Lyer\\_illusion](http://www.newworldencyclopedia.org/entry/Muller-Lyer_illusion)), we still see two lines of equal length as being different. Chabris and Simons identify six illusions, including the limits of attention (the invisible gorilla), false memories, overconfidence, knowing less than we think we know, unjustified perceptions of causality, and a belief in the potential for human improvement. As in the Müller-Lyer, these cognitive illusions arise automatically, and there is little we can do to avoid them.

The illusions are closely related to each other. In fact, the classification is sometimes rather fuzzy, but that's not a serious problem. Their significance lies not in the classification but in the common thread that underlies them. The figures in the Müller-Lyer illusion are two dimensional, but our brains are programmed to deal with a three-dimensional world, and in any reasonable interpretation of a three-dimensional world the lines are not equal in length.

All of the illusions result from adaptations that allow us to function efficiently in the real world, but this efficiency comes at a price. If the real world is not as we automatically assume it to be, we will be trapped into making errors. Worse, we may be unaware that an error occurred, and so we are unable to learn from experience.

The authors' chapter on illusions of memory further illustrates this theme. We remember events that never happened. Vividness of the memory and confidence in our recall are not valid indicators of accuracy. To understand why, we must realize that the adaptive function of memory is not to generate an accurate retrieval of the past (our ancestors did not have to take multiple-choice tests). Rather, it is to help us cope with the present and predict

the future. Memory performs very well in this respect by relying heavily on constructive processes. Evolution did not care if this led to occasional errors of eyewitness testimony.

Most of the points made by the authors are not new. The false memory phenomenon is now well known. Recent books by Arieli (2008) and Tavriss and Aronson (2007) speak to our irrational choices and our ability to deceive ourselves. Taleb (2007) addressed the dangerous tendency to rely on expectations. The general problem of intuition—to what extent it is accurate and when it misleads us—was reviewed in an excellent book by Myers (2002). None of these authors, though, provided such a comprehensive review of perceptual and cognitive illusions and the principles that explain them.

Chabris and Simons use numerous anecdotes to support their argument. They recognize the dangers of this approach, but they are correct in noting the persuasive power of a good anecdote. The mistaken claim by Hillary Clinton of coming under sniper fire in Bosnia was probably the result of normal memory processes, not a fabrication, but we cannot know for sure.

More important, the authors' anecdotes are backed up by research. The research allows them to identify potential moderator variables and to use these variables to interpret the anecdotes. For example, studies show that talking on a cell phone induces a dramatic increase in the number of people who fail to see the “invisible” gorilla, thus reinforcing anecdotal claims of accidents caused by cell phone use.

The illusions are so powerful that the authors themselves appear to have been trapped by one. The illusion of cause is the tendency to see patterns in random events and to look for a causal explanation whenever we see a pattern. Some examples were described by Tversky and Kahneman (1974), who noted among other things the failure to grasp the statistical concept of regression. When two quantities are not perfectly correlated, an extreme score on one is associated with a less extreme score on the other. This effect is a necessary consequence of random events, but when we notice it, it seems to demand a causal explanation.

Chabris and Simons may have been fooled once or twice by regression effects. They describe a universal tendency toward overconfidence; in skilled tasks people predict greater success for themselves than they achieve. Furthermore, when one's success rate is low, overconfidence is even greater. The authors discuss a number of reasons why the least successful among us might suffer most from the illusion of overconfidence. The simplest explanation, however, is that there may be nothing to explain. Since success and confidence are not perfectly correlated, statistical regression would predict exactly that result. (Consider the extreme case: With a success rate of zero, any error in confidence must be an overestimate.) In describing the illusion of overconfidence, Chabris and Simons have encountered the illusion of cause.

The authors may also be unduly impressed by some other apparent illusions that might be the result of more benign mechanisms than they suggest. Consider, for example, the “Lake Wobegon effect”: Most people believe that they are above average in intelligence,

sense of humor, driving ability, and so on. One can account for some of this effect simply by noting that these factors are multidimensional, and people differ in the weights they assign to the dimensions. For example, Joe finds raunchy jokes funnier than Sally does, but Sally finds slapstick funnier. By changing the importance of these two dimensions, both Joe and Sally can reasonably claim to have the better sense of humor.

These are minor quibbles, though. The authors present a convincing case that everyday illusions have serious consequences, especially when we are not aware of their operation. For example, seeing causal effects where none exists leads to a predictable increase in the number of children who are not vaccinated, thereby putting all children at risk. They point out that some illusions, overconfidence, for example, are perpetuated through social reinforcement. People will follow a leader who exudes confidence. A profession that is known for the accuracy of its confidence judgments is meteorology, yet Chabris and Simons suggest that people prefer an overconfident weather forecaster to a well-calibrated one.

## Intuition and Its Illusions

There have been several theoretical discussions recently concerning the relative strengths and weakness of intuition when compared with deliberate judgment. One recent topic, not discussed by Chabris and Simons, is the role of intuition in moral judgment (see Bennis, Medin, & Bartels, 2010). Bennis et al. (2010) argue strongly for an intuitionist (rule-based) theory of morality. There is no doubt that intuition is a powerful determinant of behavior, but how much is it to be trusted? Are there illusions of morality? Malcolm Gladwell's (2005) best-seller *Blink* purported to show the hidden power of intuition. If nothing else, *The Invisible Gorilla* is a welcome counterweight to Gladwell's argument.

Chabris and Simons offer a few ideas on ways to overcome the illusions, but I remain rather pessimistic about the impact of their book. For one thing, there is a world of difference between knowing about the illusions and being able to override them. Consider the Müller-Lyer illusion again. Knowing that it exists does not remove it.

We see here the difference between declarative knowledge ("knowing that") and procedural knowledge ("knowing how"). Chabris and Simons describe at length the illusions created by looking for causal processes in correlational data. Every psychology student can repeat by rote, "Correlation does not imply causation," and the authors describe a useful device for guarding against unwarranted causal conclusions. But for it to work, one must remember to use the device.

In my own course on research methods, I expound at length on the principle and inform students that on one exam roughly one third of the questions will test their








understanding of it. Despite the prior warning, at least one third of the students get at least one third of these questions wrong. Everyday illusions are powerful.

The authors suggest that we might develop technological fixes for some especially problematical cases, but this would require a case-by-case approach. Is there a general way of coping with the illusions? Coaching and education might be helpful, but we need research to find out if and when they work. One possible solution not mentioned by the authors is what we might call *social facilitation*. You or I might not see the gorilla, but others may point it out to us, provided we are receptive to these corrections.

In an ideal world, books such as *The Invisible Gorilla* would make everyone sensitive to common illusions and less ready to blame others for behavior that is predictable. But it's not an ideal world, so if human behavior does not change, then perhaps there will always be a market for books of this sort, and demonstrations of the invisible "gorillas in our midst" will continue to astonish.

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