



## The innate effect of Bias

### Overview

Research by behavioural economists has clearly demonstrated we are not rational; in fact we are naturally irrational. Deeply embedded biases affect every decision we make, there are conscious factors, learned from experience, subconscious cognitive biases and affective factors including our feelings and emotions at the time the decision is made. The challenge is to accept people as they are and then work rationally within our innate biases; this needs a rational approach to an irrational problem!

### The neuroscience view

Understanding how the brain works is essential for effective communication<sup>1</sup> and understanding why people react to messages and make decisions<sup>2</sup> in the way they do.

The brain is continually bombarded with stimulation through sight, touch, hearing, taste and smell. To survive, it deals with most of this information unconsciously. The conscious mind has the capacity to deal with around seven items at one time (typically between 5 and 9), the rest of the information is processed unconsciously by using the stored 'maps' hardwired into the brain.

Every stimulus causes a pattern of synapse paths to form, in combination these patterns form your memory, and initially these connections are short lived. To save energy the brain deals with each new stimulation by trying to match it with previous patterns – this is the first and automatic response. Repeated connections form stronger paths and your long term memory maps (eg, habits). These long term memories are the 'hard wiring' in your mind and become the basis for how we interpret our world. Each individual's life experiences have created unique pathways, which result in different approaches to learning, decision making and the interpretation of messages.

Perceptions (our reality) are driven by this hardwiring. Changing the old wiring is difficult, which makes breaking established habits or perceptions difficult. Creating new wiring is much easier and new habits become stronger with conscious repetition but it takes a long time to completely over-write a strong habit.

This means every message received by a person is fitted to and filtered through their previously stored experiences. Even if several people receive exactly the same message, everyone will experience the meaning of the message differently and react differently. A simple question (the message) asking how much a typical meal costs will generate vastly different answers depending on the individuals typical dining experience ranging from \$15 for a suburban takeaway to \$150 for a city restaurant. Both answers are correct!

### Innate cognitive bias

The evolution of the human race has left us with a series of cognitive biases that are innate – factors that we are born with and which can easily generate irrational behaviours in the modern business world. Some of the more important are discussed below.

Two biases that cut in when you have an issue that has already cost money and needs more funds committed to prevent potential future losses are *loss aversion* and *Hyperbolic discounting*.

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<sup>1</sup> For more on communication theory see:

[http://www.mosaicprojects.com.au/WhitePapers/WP1066\\_Communcation\\_Theory.pdf](http://www.mosaicprojects.com.au/WhitePapers/WP1066_Communcation_Theory.pdf)

<sup>2</sup> For more on decision making see: [http://www.mosaicprojects.com.au/WhitePapers/WP1053\\_Decision\\_Making.pdf](http://www.mosaicprojects.com.au/WhitePapers/WP1053_Decision_Making.pdf)



**Loss aversion** means that most people are far more concerned about losing \$100 than they are happy about gaining \$100. Rationally we should have no difference in reaction: \$100 is \$100; but people will try much harder to avoid a loss than to make a similar sized gain. Given the choice of receiving a profit of \$9,000 now or accepting a risk that has a 90% chance of increasing the profit to \$10,000 dollars, but a 10% chance of receiving nothing; most people will take the \$9,000. Most people are *risk averse*<sup>3</sup> as is demonstrated by the proverb 'a bird in the hand is worth two in the bush'. However, if the choice is to take a sure loss of \$9,000 or accepting a risk that has a 90% chance of increasing the loss to \$10,000 dollars, but a 10% chance of losing nothing; most people will take the 90% chance of losing \$10,000; most people are also *loss averse*.

**Hyperbolic discounting** (or near-term bias) is the preference for short term gratification over long term benefits. Most people over-emphasise the value of short term rewards over more substantial long term benefits.

Put these two traits together and our natural instinct is a strong bias towards not losing more money this month even if the short term gain is far outweighed by the longer term losses caused by the short term focus.

Another pair of biases that affect problem solving are first our strong preference for our own creations over other people's creations; reinforced by what behavioural economists call the 'IKEA Effect', the more labour we expend on a project, the more we love the result regardless of its quality. If someone has worked hard on the solution to a problem (or the creation of an estimate) they are innately programmed to love their solution!

These are just a few of the biases built into all of us; most people are innately optimistic, over-value their personal skills and capabilities and over-value the advice of distant experts compared to the advice from someone they know well (for more see Annex 1 at the end of this White Paper).

The challenge is firstly to resist these biases in your own thinking (which is only possible at the conscious level of thought) and then to shift everyone's thinking far enough into the future to allow a benefits focused solution to be jointly developed. If someone is reacting unconsciously, you need to gently bring their reaction into their conscious thinking to allow a different option to be developed.

## Learned bias

The innate cognitive biases briefly outlined above are overlaid with learned behaviours 'hard wired' into our brains. These learned behaviours manifest as perceptions and the stereotyping of groups of people: '*The PMO staff are all focused on generating masses of useless data*' - firstly there are no positive stereotypes, second, if a new PMO manager is trying to make a difference, she will have to break the mould created by the stereotyping before anyone will listen to her insights.

Learned biases relate to the perception of risk, expectations and most aspects of estimating. Most 'normal people' would find the idea of jumping out of a perfectly good, working aeroplane unacceptable, or at least very risky. Parachutists think it is fun!

## Affective factors

A person's current state of emotion can easily overpower rational thinking. If a person is tired, or emotionally stressed for any reason, these negative emotions will affect all of the decisions made regardless of the current decision's relationship to the cause of the emotion. Similarly if a person has just won an important sporting event (important to them, not to you or the world at large), the feeling of being successful and capable of winning will impact decisions and encourage more risky decisions.

In addition to their current emotions, we all store emotion charged memories. These emotions are automatically triggered in situations perceived to be similar to the stored memory.

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<sup>3</sup> For more on risk assessment see: [http://www.mosaicprojects.com.au/WhitePapers/WP1015\\_Risk\\_Assessment.pdf](http://www.mosaicprojects.com.au/WhitePapers/WP1015_Risk_Assessment.pdf)



## Conclusion

Everyone knows they are not biased (or are far less biased than most)<sup>4</sup>:

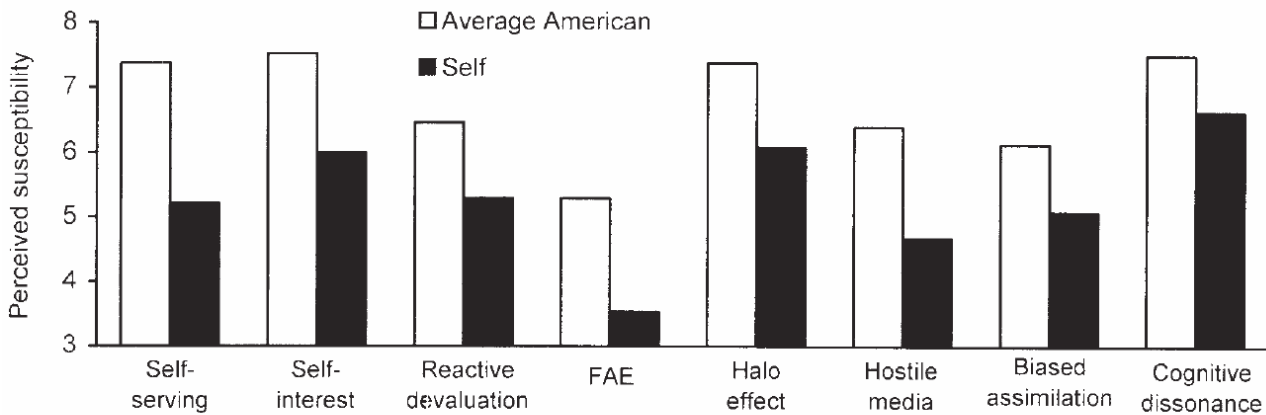


Figure 1. Perceptions of one’s own versus others’ susceptibility to eight different biases in human judgment and inference. FAE = fundamental attribution error. Adapted from “The Bias Blind Spot: Perceptions of Bias in Self Versus Others,” by E. Pronin, D. Y. Lin, and L. Ross, 2002, *Personality and Social Psychology Bulletin*, 28(3), p. 372. Copyright 2002 by The Society for Personality and Social Psychology. Adapted with permission of Sage Publications.

The irrational impact of bias and emotions is unavoidable. Every one of us is affected by our make up all of the time. What is important when considering project estimates, designing a communication or reacting to a message is to try to step back from the immediate reaction/assessment and as far as is possible take into account the likely affect of the factors discussed in this White Paper.

## Annex 1: Decision-making and behavioral biases

Source: [http://en.wikipedia.org/wiki/List\\_of\\_cognitive\\_biases](http://en.wikipedia.org/wiki/List_of_cognitive_biases) (the Wikipedia list links through to more substantive references)

A few of the biases listed in this Wikipedia entry include:

- **Ambiguity effect** – the tendency to avoid options for which missing information makes the probability seem *unknown*.
- **Anchoring** – the common human tendency to rely too heavily, or "anchor," on one trait or piece of information when making decisions.
- **Availability cascade** – a self-reinforcing process in which a collective belief gains more and more plausibility through its increasing repetition in public discourse (or "repeat something long enough and it will become true").
- **Bandwagon effect** – the tendency to do (or believe) things because many other people do (or believe) the same. Related to groupthink and herd behavior.
- **Bias blind spot** – the tendency to see oneself as less biased than other people.
- **Clustering illusion** – the tendency to see patterns where actually none exist.
- **Confirmation bias** – the tendency to search for or interpret information in a way that confirms one's preconceptions.
- **Conjunction fallacy** – the tendency to assume that specific conditions are more probable than general ones.

<sup>4</sup> Source of chart: [http://www.psych.cornell.edu/sec/pubPeople/tdg1/Pronin\\_Gilo\\_&\\_Ross\\_05.pdf](http://www.psych.cornell.edu/sec/pubPeople/tdg1/Pronin_Gilo_&_Ross_05.pdf)





- **Distinction bias** – the tendency to view two options as more dissimilar when evaluating them simultaneously than when evaluating them separately.
- **Endowment effect** – ‘the fact that people often demand much more to give up an object than they would be willing to pay to acquire it’.
- **Experimenter's or Expectation bias** – the tendency for experimenters to believe, certify, and publish data that agree with their expectations for the outcome of an experiment, and to disbelieve, discard, or downgrade the corresponding weightings for data that appear to conflict with those expectations.
- **False consensus effect** – the tendency for people to overestimate the degree to which others agree with them.
- **Focusing effect** – the tendency to place too much importance on one aspect of an event; causes error in accurately predicting the utility of a future outcome.[10]
- **Framing effect** – drawing different conclusions from the same information, depending on how that information is presented.
- **Gambler's fallacy** – the tendency to think that future probabilities are altered by past events, when in reality they are unchanged. Results from an erroneous conceptualization of the Law of large numbers. For example, "I've flipped heads with this coin five times consecutively, so the chance of tails coming out on the sixth flip is much greater than heads."
- **Hindsight bias** – filtering memory of past events through present knowledge, so that those events look more predictable than they actually were; also known as the "I-knew-it-all-along effect."
- **Hyperbolic discounting** – the tendency for people to have a stronger preference for more immediate payoffs relative to later payoffs, where the tendency increases the closer to the present both payoffs are.
- **Illusion of control** – the tendency to overestimate one's degree of influence over other external events.
- **Illusory superiority** – overestimating one's desirable qualities, and underestimating undesirable qualities, relative to other people. (Also known as "better-than-average effect," or "superiority bias").
- **Loss aversion** – ‘the disutility of giving up an object is greater than the utility associated with acquiring it’. (also known as **Sunk cost effects** and **Endowment effect**).
- **Negativity bias** – the tendency to pay more attention and give more weight to negative than positive experiences or other kinds of information.
- **Neglect of probability** – the tendency to completely disregard probability when making a decision under uncertainty.
- **Omission bias** – the tendency to judge harmful actions as worse, or less moral, than equally harmful omissions (inactions).
- **Optimism bias** – the tendency to be over-optimistic about the outcome of planned actions. This affects the estimating processes in all projects (time, cost, risk, etc) and continues into the work of the project (sustained false-optimism bias). This bias tends to drive behaviours that suppress negative information (eg, trend reports) on the false assumption things will improve.
- **Outcome bias** – the tendency to judge a decision by its eventual outcome instead of based on the quality of the decision at the time it was made.
- **Planning fallacy** – the tendency to underestimate task-completion times.
- **Post-purchase rationalization** – the tendency to persuade oneself through rational argument that a purchase was a good value.
- **Pseudocertainty effect** – the tendency to make risk-averse choices if the expected outcome is positive, but make risk-seeking choices to avoid negative outcomes.
- **Selective perception** – the tendency for expectations to affect perception.
- **Semmelweis reflex** – the tendency to reject new evidence that contradicts an established paradigm.



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- **Status quo bias** – the tendency to like things to stay relatively the same (see also loss aversion, endowment effect, and system justification).
- **Wishful thinking** – the formation of beliefs and the making of decisions according to what is pleasing to imagine instead of by appeal to evidence or rationality.
- **Zero-risk bias** – preference for reducing a small risk to zero over a greater reduction in a larger risk.

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