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Cover Image:
The Flow of Things,
Pastel, 9"x14"
Matthew B. Furlong

Taming Our Irrational Brain

By Edi Alvarez

A recent survey reveals that by the age of forty-one, women are less satisfied with their financial situation than men (1). How does one actually attain financial satisfaction? Deliberate financial decision-making lies at the core of financial satisfaction. What insight does science provide on financial decision-making, and how do the relevant scientific findings inform us, enabling us to make better financial choices? Neuroscience and behavioral science suggest that the process of financial decision-making is far more irrational than we might ever have imagined.

The following example (adapted from Burnham [2]) illustrates the subtle complexities of general decision-making: Susan is thirty-two years old, single, and very intelligent. She majored in chemistry at a top university. As a student, she was deeply concerned with issues of discrimination, peace, and social justice, and she was a member of AWIS.

Which of these two alternatives would you think most probable?

1. Susan is a chemist.
2. Susan is a chemist and is active in the peace movement.

Although answer Number 2 is less probable, the majority of people select it. Why? We get caught up in the story, and unless we engage our rational brain, we will complete the story with the most compelling ending rather than answer the actual question. It seems that making decisions based on vague or imprecise patterns employing the irrational part of our brain is quite natural (2).

Neuroscience and Purchasing Decisions

This tendency to use the irrational part of our brain adds an important dimension to our decision-making. Imagine yourself needing to make the very first big purchase for your new lab. Should you choose Brand A, B, C, or another? You weigh and rank each choice working on a rational logical approach, but in the end, you wind up buying the brand that engenders the greatest feeling of success. Why?



Marketers understand that our best intentions at rational, calculated decision-making can be manipulated by catering to our “hidden preferences, unconscious desires, and irrational dreams” (3). Their expertise is derived, in part, from recent discoveries in neuroscience. It is through neuro-imaging, says Martin Lindstrom, author of *Buyology*, that “we can now understand better what really drives our behavior, our opinions, our preference for Corona over Budweiser, iPods over Zunes, or McDonald’s over Wendy’s.” Neuroscience has even analyzed how our brain makes decisions about how much we’re willing to pay (3). Lindstrom describes an experiment in which subjects are presented with differently priced wines while subjected to an fMRI (functional Magnetic Resonance Imaging) brain scan. He found that “when the expensive wine was presented, there was a flurry of activity in subjects’ medial orbitofrontal cortices, where they perceived pleasantness” (3). The very same wine produced no such response when presented at a normal price. Apparently, the higher price triggered interest.

Although some effort has been made over the last century to account for economic behavior, economic models have remained fairly committed to the notion of market efficiency premised on rational financial decision-making. Yet psychologists continue to view humankind as fallible and sometimes even self-destructive when it comes to fiscal responsibility (4). Global economic forces have great influence over decision-making processes, but real-life financial decisions are made at the individual level, where impulse and volatility often dominate.

More recently, behavioral economics has expanded on the rational decision-making perspective, bringing us somewhat closer to a real-world understanding of individual financial behavior. The branch of neuroscience concerned with studying how the brain responds to economic decisions, neuroeconomics, is making large contributions to our understanding of how we make individual financial decisions. New findings are challenging older economic models that assume decision-making is a unitary process involving mostly market forces and questions of supply and demand (5). Too much emphasis on traditional economic models, moreover, can leave us with the somewhat false impression that the brain is structured so that thought and reason rule. It would seem natural, for example, that people will make optimal choices given what they want, know, and can afford (6). As smart, educated, and logical individuals, we are inclined to believe the process is deliberate. As it turns out, many of our financial decisions are decidedly irrational.

To explain irrational human economic choices, Daniel Kahneman and Amos Nathan Tversky developed “prospect theory” (3). The theory posits the idea that the brain has a “thinking” side and a dominant “feeling” side. At the heart of this domination are so-called somatic markers. These are synaptic imprints that influence all our decisions by unconsciously tainting our receptiveness to any given product (3). These markers are imprinted on our brain as we grow. Whether it was the particular brand of peanut butter or toothpaste your family routinely purchased and enjoyed when you were a child, or that awful cod liver oil your dad made you swallow, your brain retains the pleasant or unpleasant association as a “marker” that you carry with you throughout your life (3). Somatic markers, although fundamentally irrational, are an integral and critical part of our valuation system. They play a part in our decision-making process.

Individual decision-making can thus best be described as a melding of processes that are separated into two main categories: automatic and controlled processes (4). How do these processes impact our financial decisions? Below are a few examples that highlight the nature of irrational decision-making with its inherent financial implications.

Pattern Seeking, Loss Aversion, Fear, Pride, and Envy

I begin these examples by recounting the “superstitious-pigeon” experiments from the most influential and well known psychologist of the 20th century: B.F. Skinner (5). Skinner fed pigeons on a

fixed schedule that was not connected to the birds’ behavior. Over time, however, the pigeons individually began to repeat actions they were doing just before they were fed. One turned in circles; another lifted its head repeatedly (5). In essence, the pigeons accepted that these patterns and associated rituals were necessary to receive their dinner. In a similar way, we routinely identify people, objects, and actions that we term as “lucky” and incorporate them into our lives. In this way, we’re not so very different from “superstitious” pigeons (2). We impose rituals to provide a sense of control over random events in our lives.

Stock-picking and market-timing techniques, for example, are linked to this fondness for patterns. Expert money managers get paid millions to do this sort of work, and yet research suggests that two-thirds of them underperform in any given year as they try and fail to consistently “beat the market” (7,8). Market timing invariably fails because people can’t constantly predict the best asset to buy and sell. In my experience, otherwise intelligent individuals are led time and time again into buying high and selling low because the patterns appear so compelling.

Another example of irrational decision-making is “loss aversion.” “People hate losses much more than they enjoy gains” (2). Daniel Kahneman asked individuals for the size of the smallest jackpot that would entice them to gamble. He found that the potential reward must be double or more for individuals to risk their money—we must see a large gain to tolerate a loss. The magnitude or degree of our individual “loss aversion” is an important consideration (2).

In practical terms, this can translate into staying with a bad investment, hoping to break even. Or worse, the fear of losing can drive us to make even riskier purchases in an attempt to recover from a recent loss. A comparison to gambling addiction is unavoidable. For some, it may actually mean just the opposite: selling low to avoid further losses rather than staying the course in accordance with a predetermined plan. Experienced money managers are not immune to this unconscious tendency. They compensate for their “loss aversion” by developing rituals to engage the “thinking” brain and forcing themselves to follow defined trading behaviors.

Although it is irrational, people appear to fear “outcomes that they know are not objectively serious” and experience “little trepidation toward outcomes that they know to be seriously threatening” (4). For example, people fear airplane crashes more than car crashes, although the latter are statistically more likely to occur. In addition, fear is an overpowering emotional reaction that can paralyze our analytical abilities. In the wake of September 11, the Conference Board’s Consumer Confidence Index slumped by 25% (9). From a logical perspective, the heightened state of security after the event should have made us safer and therefore more confident. We may not realize that we are being driven by





fear, but the amygdala (deep in the brain) causes our sense of panic (4) and drives our emotional reaction. In most financial situations, the ideal behavior would be to stay in tune with our feelings and build rituals or behaviors that control or distance our fears and prevent overreaction.

Pride, it would appear, can take precedence over base fears of financial loss. All around the world, people show themselves willing to lose money rather than self-esteem (2). Men appear particularly susceptible to this type of financial loss. In fact, those with higher levels of testosterone were found to be much more likely to accept higher levels of risk in exchange for relatively smaller rewards (11). There is “direct, scientific evidence that parts of the human brain outside of the prefrontal cortex pushes people down the path that costs them money,” says Terry Burnham (2).

A close sister to pride is envy. We all understand what is meant by the catch phrase: “keeping up with the Joneses”—the supposedly inexplicable drive to buy what others have. This inclination appears to originate with mirror neurons that are “believed

to be responsible for why we often unwittingly imitate other people’s behavior” (3). Moreover, mirror neurons don’t work in isolation. The evidence suggests that dopamine—“one of the brain’s pleasure chemicals and one of the most addictive substances”—is released during emotionally driven decisions (3). This combination drives us to covet what others have, and in turn our brain rewards and encourages us with a pleasure shot of dopamine.

Financial Decisions, Trust and Women

How do we make daily financial decisions? Colin F. Camerer describes three valuation systems (9):

1. Pavlovian, which is triggered in anticipation of a reward

or positive association;

2. Habit, which is slow to adjust to sharp changes but quick to respond;

3. Goal directed, which requires deliberate cognitive thinking.

Financial decisions such as buying a house, choosing between two job offers, or making long-term investments are complex, requiring weighing options and analyzing scenarios. Given the current uncertainty in the marketplace, some may feel that the old norms no longer apply. So, how do we make such critical financial decisions in these uncertain times? Do we leap at the promise of reward (Pavlovian)? Do we search for familiar patterns and rely on stored experience (habit)? Or take the third road (goal directed) and stay focused on our goals? It should not take us long to realize that this level of analysis requires expert consultation, yet even this choice is not without its own risk.

Take, for example, those who for years invested with Bernard Madoff. How many experts and experienced professionals with years in the financial industry placed their trust in him? The evidence so far indicates that Mr. Madoff had not purchased securities for 13 years! (12). And yet when asked, his investors believed that they had performed their due diligence, claiming they went through a methodical analysis. Those who chose not to invest with Mr. Madoff argue that the signs were there if you were sophisticated enough to see them (12). So, how did it happen? My assessment is that investors were led or perhaps misled by a compelling story and overlooked the evidence. I want you to consider that a survey of more than 250 financial analysts found that 91% felt that the most important task in evaluating an investment is to arrange the facts into a compelling story (10), and therein we see the downfall of Mr. Madoff’s investors. It’s a little like the sales clerk who tells you how great you look in the outfit she’s encouraging you to buy. We hear the promise of a reward, and immediately the “mirror neurons” begin firing and the dopamine begin flowing, clouding our brain so that we overlook rational analysis. During our purchase decision, the clerk’s appearance and apparent excitement can cause us to override our own plans. Both of these examples are at the root of why we need to seek third-party, unbiased opinion and include a trusted source in our important decisions.

We know that trust, as the saying goes, should be earned. Outward appearances or a compelling story should not deny our “thinking brain” the opportunity to do a proper appraisal. Moreover, we need to be aware of the correlation between the release of the neurotransmitter oxytocin and the inclination to trust others, which may place women in a more vulnerable position (12). Studies suggest that a tiny rise in oxytocin correlates with individuals being more generous with their money (13). This is the same hormone that plays a critical role for women in pregnancy and is known to play a role in our willingness to trust our loved ones (14). Financial surveys suggest that women tend to trust the advice of family members above all (15). We are also inclined to seek consensus and feedback from friends and family in the

process of formulating our financial decisions. This approach can lead us to successful financial decisions if those we trust have the relevant experience, training, and our best interest at heart.

Part of maintaining a balance between our irrational and rational brain requires that we have a well-ordered path to what we want, including clearly defined and delineated objectives. The mere exercise of writing down our goals and actions reinforces objective thinking and improves our ability to tame unbidden emotions as they arise. It is possible to harness our irrational inclinations and create financially positive outcomes. There are healthy spending habits that can be developed, such as balancing your accounts on a regular basis, not using high-rate credit cards, planning for expenses, and saving for a rainy day. Good habits such as these and many others can empower us to make crucial financial decisions quickly and yet remain true to our objectives.

By preventing extraneous influences from swaying or distracting us, healthy financial habits can produce concrete rewards that will increase our sense of financial satisfaction. As you plan that well-deserved holiday to Paradise, remember with satisfaction all those spur-of-the-moment outfits you didn't buy, and I guarantee you will feel the pleasure center of your brain receive a well-earned dopamine reward!



Finances can support or derail professional and family life. It is Edi's intention to be both a resource and advocate for our financial health. Edi is a Registered Investment Advisor in California and Certified Financial Planner™ providing financial services to individuals and businesses. She is a past president of the Association for Women in Science, San Francisco Chapter, and presently serves on the AWIS Finance Committee. Edi can be contacted at edi@aikapa.com.

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