Worth Noting

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Worth Noting is the journal of research and conferences company L21. It is focused on issues of relevance and interest to senior executives.

Our personalities shape how effective we will be at our jobs. It also determines who will become the leaders within our organization. Most people want to be known as rational, assured and self-controlled when we make decisions.

The common belief is that some decisions should be made rationally and others emotionally. That is why we advocate being a balanced person capable of both rationality and emotion at different times.

This sounds fair enough doesn't it? We normally see something as being either a 'rational response' or an 'emotional response'. We are either using the 'rational' part of our brains or the 'emotional' part when making decisions. This way of thinking has roots from the ancient Greeks to Descartes to the Enlightenment which lead to the supposed culmination of the triumph of reason over emotions.

When making decisions, we believe that some people are primarily emotionally led and others are guided by their reason. However, as we will see, experts are finding that many of our assumptions about how rational thinking and emotions work together, separately, and interact are much less straightforward than we generally assume.

Experts have one advantage in trying to understand decision making that the philosophers of old did not have: ***medical science***. Rather than speculating on how the human mind works, neuroscientists focus on experiments that closely observe brain activity.

But the knowledge gained from neuroscience is not useful only to scientists and philosophers. It is useful to all of us because it involves a greater understanding of how we think and how we make decisions. Indeed, especially in the United States, neuroscience is playing a greater and more powerful role in business. Top business leaders are increasingly being schooled in the basic findings of the neuroscientists.

Imagine how much more effective we would be in negotiations if we better understood how people make decisions. Imagine how much better we would be at managing people if we better understood why people make the kind of decisions they do at the neurological level.

In this edition of *Worth Noting*, we will summarise some of the findings in neuroscience as to how we make decisions – whether these be personal or business decisions. Some of these findings may lead us to reassess how logically or emotionally led we might otherwise believe ourselves to be.

Rational vs. Emotional?

We generally know the distinction between 'rational' and 'emotional' reactions. However, it is important to see how neuroscientists see the distinction from a brain level activity perspective.

In terms of human responses, let's divide the brain into two systems: the Emotional System (**System E**) and the Rational System (**System R**).

System E is the part of our brain that is automatic and effortless in the way it processes information. In other words, **System E** pre-screens information before we are even consciously aware that it made an impact on our minds. In this sense, **System E** becomes the default option and deals with information in an associative way. For example, this means that if we see another human suffering, through an act of association, we ourselves feel a sense of suffering. In another more primal example, if we have once felt the bite of a German Shepherd, we might feel a sense of fear upon seeing another German Shepherd.

System R on the other hand is logical and deductive in the way it handles information. To use it requires deliberate effort. Because it is logical, it can only progress one step at a time and is relatively slow compared to **System E**. In order to convince **System R** that something is true, a logical argument and empirical experience is needed.

Below is how one expert differentiates between the two systems.

Two Systems of Reasoning

System E	System R
Holistic	Analytic
Affective (what feels good)	Logical
Associative – judgments based on similarity	Deductive
Concrete images	Abstract images
Slower to change	Changes with speed of thought
Crudely differentiated	Highly differentiated
Experienced passively and preconsciously	Experienced actively and consciously
Automatic and effortless	Controlled and effortful
Self-evidently valid	Requires justification via logic & experience

Source: Epstein (1991)

How do we make decisions?

This is really the most interesting and useful part about the findings. How do we make decisions?

Evolutionary biology helps us to explain why **System E** is the default option. We needed emotions much more than we needed logic. For example, consider the 'fight or flight' response to a threat. If we stand near a snake and the snake suddenly rears up, it has been shown through experiments in brain wave activity that the danger is first perceived by the **System E** part of the brain. The reaction is immediate, instinctive and possibly life saving.

Imagine if the snake was locked in a glass cage and it suddenly reared at you. The **System E** part of the brain would tell us to jump back immediately even though the slower **System R** part would tell us that we are protected by a layer of glass. We would jump back and only then rationally realize that we were in no danger from the snake.

We now get to the really interesting and perhaps surprising part.

Most people think that emotions are the conscious response to events or actions: something happens and your brain works out the emotional response which might be anger, sadness, happiness, and so on. The assumption is that the brain tells the body how to react whether this is expressed through crying, your heart pumping faster etc.

Common assumption: Event → Emotional response → Bodily response

William James lived in the nineteenth century and has often been called the "grandfather of modern psychology." He was amongst the first to claim that true causality actually flowed from the body to the brain. In James' view, the brain assesses the situation so quickly, there isn't time for us to be consciously aware of how we feel. Instead, the brain surveys the body, takes the action (such as increased heart rate, sweating etc.) and then infers the emotion that matches physical signals that the body has generated.

Does this sound counter-intuitive? Modern experiments seem to support James' claim. For example, some people were asked to smile and others asked to frown.[1] Whilst smiling or frowning, those people were then asked to evaluate certain products. Those who were smiling significantly gave a much more favourable evaluation than those frowning. When the roles were reversed a few days later, those who were previously asked to frown but who were now smiling now gave significantly more favourable reviews and vice versa.

Similar experiences have been found with people whose hearts were artificially made to beat faster to 'manufacture' anxiety. Their supposed 'reasoned' and deliberate responses about certain products varied according to whether they were in a state of induced anxiety or were normal and comfortable.

So the chain of causation is more like the one below.

<u>Tested assumption:</u> Event → Bodily action → Emotion → Choice of Action

How does this relate to how we make decisions?

The important thing to take away here is that neurological tests show that bodily actions influence emotions which in turn influence us even when we are focused on making rational decisions.

Emotional response and activity take part in particular areas of the brain. There are people through either tragic accidents or the result of surgery who have had the emotional areas of their brains damaged.

Many scientific and psychological tests have shown that the lack of emotion or those who have emotionally important areas of their brain damaged tend to make decisions that are rationally sub-optimal. This is because their emotional reaction to events would be somewhat unusual, leading to what a normal observer would see as an 'irrational' decision making reaction. This is despite the fact that the reasoning areas of their brain remain completely undamaged.

[1] Epley & Gilovich (2001), *Psychological Science* Vol. 12 No. 5.

On the other hand, when negative emotions such as fear are neurologically stifled, the decision making result might actually be positive. One such test and the results are described below.[2]

In a gambling game, each player was given $20. They had to make a decision each round of the game: bet $1 or not bet. If the decision was not to bet, the task advanced to the next round. If the decision was to bet, players would hand over $1 to the dealer. The dealer would then toss a coin in view of each player. If it landed heads, the player lost the dollar. If the coin landed tails, $2.50 was added to the players account. This game was played many times over to make the results statistically significant.

This game was played with three groups, ***all tested to share similar capabilities for rational thinking***:

1. Normal people with no brain damage
2. People who had sustained damage to the neural circuitry in their brain associated with fear (i.e., they no longer experienced fear) but were completely normal otherwise
3. Players with lesions to the brain not associated with the fear neural circuitry.

All players were encouraged to think deliberately and rationally about whether they bet each round.

The results were very interesting.

Players with the damaged fear circuitry invested in 85.2% of rounds following losses on the previous round. Normal players invested in only 46.9% following loss in the previous round.

Moreover, the experiment showed that ***the normal people were likely to make less rational decisions as the game went on!*** So too were those with lesions but without damage to the fear neural circuitry. They were less likely to bet as the game went on after a previous round of loss. The rational decision would be to play every round since one had a 50% chance of gaining $2.50 and losing only $1. Significantly, those not capable of feeling fear tended to continue to bet even after a loss in the previous round which was the rational thing to do. Those incapable of fear came out clearly on top monetarily.

Sounds like common experience doesn't it? If not, consider the psychology of the stock market investor: what do experts like Buffet say drive the short term market: fear and greed and definitely not rationality.

[2] Bechara, Damasio, Tranel & Damasio (1997), *Science* Vol. 275

Another psychologist observes three groups of people experiencing degrees of emotions (both positive and negative) ***before*** being confronted with a situation where a decision has to be made:[3]

A. At low levels of intensity, emotions appear to play a largely 'advisory' role.
B. At intermediate levels of intensity of emotions, people begin to become conscious of conflicts between cognitive (rational) and emotional inputs. At this level, there are deliberate efforts made at 'self-control' that aim for rational thinking.
C. At intense levels of emotion, they are so powerful that decision-making is virtually precluded.

You might conclude that our ability to act 'rationally' is a matter of self-control. The higher the level of self-control we have, the more capable we are of being rational decision makers.

True, but what determines our level of self control. Consider another experiment that shows our ability to use self-control to force ourselves to be rational is more limited than we think.

Participants off similar tested rational capacities were asked to avoid eating food for three hours before the experiment. They were then put into three groups.

A. Group 1 was taken into a room where cookies had been freshly baked, so the aroma of freshly made chocolate chip cookies wafted in the air. There was also a tray laid out with the freshly baked cookies and a second tray of unappetizing radishes. They were told that they could eat as many radishes as they wanted but were NOT allowed to touch the cookies.
B. Group 2 was taken into a similar room with the two trays but was allowed to eat the cookies.
C. Group 3 was taken to an empty room.

All the food was then removed and the individuals were given problems to solve. The results were dramatic.

Group 1 (who had expended a large amount of self-control in resisting the cookies) gave up in less than half the time than those who had eaten cookies or eaten nothing at all. Group 1 also made less than half the attempts of other groups at solving the problems before giving up. Moreover, Group 1 exhibited poorer rational abilities in their attempts to solve the puzzles than the other groups even though they were individuals of similar ability to individuals in the other Groups.

[3] Camerer (2004*), Journal of Economic Perspectives*

The conclusion: ***our ability to use self-control to force our rational processes to override our emotional reaction is limited.*** Those deprived of cookies were denied a longing that was derived from the emotional **System E** area of the brain. ***Subsequently, their capacity to engage in rational activity was lowered.***

We have only detailed several experiments. Many have actually been done to investigate different areas of emotional and rational behaviour and all support the same conclusion: ***It is not a simple matter of choosing to be very 'rational' or very 'emotional'. Our emotional state influences the efficacy or otherwise of our rational capacity.***

Ramifications for business decision making

Consider the conclusions below of one neuro-psychologist:[4]

- Under emotional distress, people shift toward high-risk, high-payoff options, even if these are objectively poor choices. Rationality is then applied to identify high-risk alternatives.
- When self-esteem is threatened, people in response rush to prove something great about themselves, overriding their normal rational way of making decisions.
- When self-control is weakened or exhausted, people become self-defeating. This includes taking immediate rewards rather than delaying much better, longer term rewards.

How is this relevant to decision making in businesses and organizations?

Imagine the self-esteem of a senior manager has been threatened and becomes emotionally fragile as a result – through rebellion in the ranks etc. Might they begin to make high risk decisions that they would not normally make to prove a point, where the risk-reward is not justified?

Or what about the way managers decide on what kind of risk-reward variable they are satisfied with? Most of us would instinctively think this was a purely rational decision. But neurological experiments suggest otherwise.

Simple surveys reveals that people tend to behave impatiently in the short term but patiently and rationally in the long term. For instance, when offered a choice between $10 today or $11 tomorrow, most chose the irrational $10 option. However, when asked whether they would choose $10 in a year or $11 in a year and a day, most chose the rational $11 option.

[4] Baumeister (2000), *Psychological Bulletin*, Vol. 126, No. 2

None of this might surprise you but perhaps the neurological activity side of it will. In experiments done by neurologists, when a choice involved an *immediate or short term (monetary) gain*, the medial orbitofrontal cortex, and the medial pre-frontal cortex were all disproportionately used. Avoiding the neuro mumbo-jumbo, these are all parts of **System E**; in other words, ***it was the emotional areas of the brain that showed most activity, NOT the rational areas even though a supposed rational reward-maximisation decision had to be made***.

However, when the decision involved a long term monetary assessment of reward-maximisation, the **System R** or rational decision making areas of the brain (pre-frontal and parietal cortex) were disproportionately active.

Classical economic theory has traditionally assumed both short and long term reward maximisation to be a rational decision that seeks to maximise utility. These theories assume that the economic agent uses a disinterested rationality to sacrifice smaller short term rewards for larger long term gains where long terms gains are clearly larger. Our brains suggest otherwise!

Finally, it is worth noting that the neuro-structure of our brain changes like a muscle. The old belief was that the number of brain cells we are born with never increase but decrease over time, and the structure of it remains the same. We now know this to be incorrect.

Not only can we generate additional brain cells to replace lost ones; we can also change the format or structure of these cells. The more we use certain parts of the brain, the more those areas are strengthened. If we get into lazy or loose reasoning habits, our neurological capacity for reasoning and making rational decisions decreases. If we deliberately practice sound reasoning techniques, that area of our brain becomes more dominant.

The good news is that we aren't always doomed to repeat mistakes after all.