The Neuroscience of Performance

People at their Best

Contents

Performance.

Have you ever known someone who aspired to poor performance? Or an organization that intentionally fostered a culture of mediocrity? Probably not – in fact these concepts seem quite absurd. Yet organizations seem to operate as if achieving high performance (in individuals and corporate cultures) was something contrary to natural human desire.

Human resources practitioners and business people alike know that high performance is paramount to business success. So they must surely be troubled by survey after survey, year after year, confirming the same levels of dissatisfaction and disillusionment with performance management processes. Rarely do managers or employees have anything positive to say, and most are predictably unimpressed with the process revisions and interventions planned for the following year.

In this paper we seek to understand human performance and its management by organizations through new insights emanating from the field of neuroscience.

In **Part One**, **Understanding Performance**, we step back from performance systems and processes to look behind the key drivers of human performance and discretionary effort.

Part Two, **Performance Levers**, explores what we now know through science about the body and mind and how performance is impacted by our physiology and psychology. We also explore how interactions with others impact us consciously and subconsciously.

Part Three, **Organizational Practices**, considers what currently works and does not work, and how mindful leaders can use new information to reframe the performance paradigm.

If you have no time to read white papers, the **Executive Summary** will give you some food for thought.

We trust that this work will contribute to thought leadership in the field of performance management, and provoke the current influencers of organizational direction to ask more questions and challenge the status quo.

SVS
July 2011

Executive Summary

This top ten table summarizes the key messages contained in this white paper:

Part 1: Understanding performance

1. **Setting goals** focuses the brain's filter systems to selectively attend to information in the environment directly relevant to achievement of the goal.
2. We are **motivated** to approach or avoid situations and people based on the reward or threat content of the perceived interaction. This motivation is biologically underpinned by the balance of neuro-chemical agents in the brain.
3. Superior performance results not from stress states but from **optimal arousal** inducing the **flow** state. Flow results from immersion and focused concentration and activates unique brain wave activity.

Key Message
Goal-setting channels attention and activates brain states that motivate us to pursue them

Part 2: Performance Levers

4. **Sleep**, **nutrition** and **physical exercise** are key physiological levers that can contribute to, and detract from, cognitive performance.
5. **Mindfulness** practice leads to improvements in focus, attention, and mental well-being through in-the-moment sensory presence and full engagement.
6. **Multi-tasking** diffuses attention, compromises memory and can impede high performance.

Key Message
Our physical and mental state impacts performance potential and can be proactively cultivated

Part 3: Organizational practices

7. **Leaders** have the positional power to influence the threat and reward factors present in the **work environment**.
8. Studies of **performance feedback interventions** show that while 30% of such interventions improve performance, another 30% have no effect and 40% actually make things worse.
9. The new performance equation requires that we must develop and measure both **capability** and **capacity**.
10. Elements that contribute to fostering a **high performance workplace** include challenge, focus, teams, support and autonomy.

Key Message
Many existing workplace practices designed to promote high performance fail this objective and can be improved

Part One: Understanding Performance

The goal of having goals

How would you measure performance at all if there were no goals?

Setting goals is a clear pre-requisite for measuring their attainment. Goals provide an end point or target, against which we can determine performance – successful or otherwise. We aspire to goal achievement – goals represent our progress over time and when achieved, provide a sense of completion and satisfaction. In this way, goals are integral to giving meaning and purpose to our lives.

What can neuroscience tell us about goals? When we set goals, we immediately channel our attention. In its default state, the brain is noisy with dozens of fleeting thoughts and our own internal narrative. Once we focus our attention on anything, we redirect random neural firing patterns to focused pathways committed to addressing the current challenge: whether that is completing a report by midday or deciding tonight's dinner. From all the possible ways in which we could deploy our energy, a specific and measurable goal immediately creates focus and energy toward its achievement.

An interesting change occurs in our brain when we commit to a goal. Once we **consciously focus** on a goal, the brain **subconsciously evaluates** goal-relevant information in our environment that is consistent with achieving the goal. Like a radar, it selectively notices incoming data that may contribute to or influence the goal. Concurrently, the brain inhibits irrelevant information to protect our delicate cognitive capacities from overload. In a study designed to determine whether subconscious goal-relevant factors would contribute to conscious perceptions, researchers found this was indeed the case. Tasked with recruiting an investigative news reporter, among whose traits rudeness and aggression were deemed to be desirable, interviewers also evaluated individuals who interrupted the interview rudely and aggressively more positively than those that apologized politely[1].

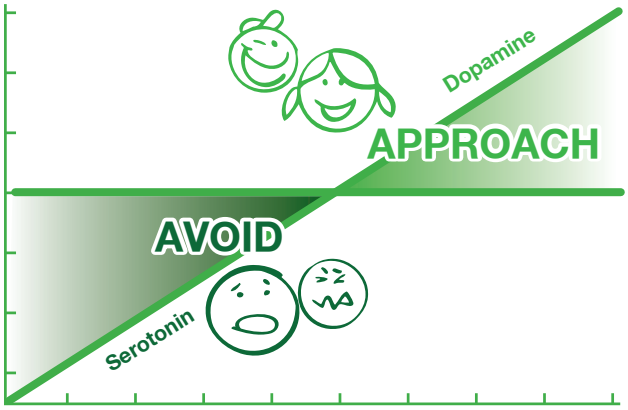
GOALS ARE INTEGRAL TO GIVING MEANING AND PURPOSE TO OUR LIVES

Goals also motivate work performance. Recent neuroscience research provides an interesting perspective. Findings show that we gain **more satisfaction** from reviewing completed goals (compared to those yet to be completed), however we are **more motivated** by what still needs to be done[2]. In effect, achieving a goal is fulfilling, while focusing on a goal to pursue is energizing. So through their effect on attention and motivation, goals are fundamental to any discussion on performance.

Motivation and the brain

Our drive to take action, achieve goals and exert effort emanates from some of our deepest and oldest brain regions. Motivation is a survival necessity, so the neural circuitry developed for it is both extensive and heavily interconnected.

You probably consider motivation a matter of conscious choice: whether you will go out for dinner tonight with friends or stay home alone and watch a movie. In the brain, decision-making, planning and control are predominantly 'top-down' processes (that is, guided by conscious prefrontal cortical activity) and with this comes responsibility or our actions[3]. But even seemingly simple choices like these are influenced by subconscious needs, priming and expectations. Evolution has something to say about your choices[4].To ensure our survival, subconscious systems have evolved to balance our choices on an approach-avoid spectrum. When we are motivated to



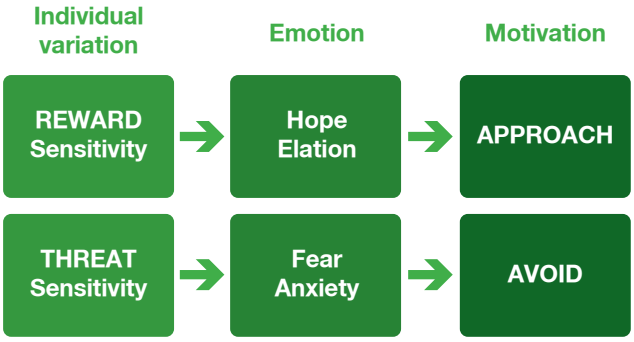
pursue something, we trigger approach mechanisms that are reinforced by the neuro-chemical dopamine. By activating this system, we receive bio-feedback that the activity is good, rewarding, enjoyable. This reinforces the positive flow and we pursue it further.

An altogether different neuro-chemical is released when we are confronted by an avoid scenario. Serotonin floods neural pathways and activates the hypothalamus (which triggers the fight/flight response in the body) if the threat is close, and the amygdala and ventral prefrontal cortex (combining emotion and inhibition) if the threat is distant[5]. The chemical balances in our neural networks are key to reinforcing how we feel, and consequently respond, to situations we are exposed to every day.

There are also significant individual variations in how we are motivated to pursue goals. Reinforcement sensitivity theory, originally developed in the 1970's by psychologist John Gray, differentiates between reward and punishment sensitivity, which influences the emotions associated with our motivation to pursue a goal. Individuals with a **reward disposition** experience positive emotions such as hope and elation when considering a goal. The neuro-chemical dopamine would be causing and reinforcing these positive emotions. As a result, the goal **feels right** and there is motivation to move toward, or approach it. Those with a punishment disposition are more likely to view goals with a fear of failure lens. The risk that the goal may not be able to be achieved generates the negative emotions of fear and anxiety, reinforced by the neuro-chemical serotonin. The prospect of the goal feels uncomfortable and the consequent motivation is to avoid it. Recent neuroscience studies confirm the behavioral activation and inhibition foundations of Gray's mode[6].

Motivation is a complex construct and its differing manifestation in individuals highlights the challenges associated with motivating employees in the workforce. The need to tailor leadership approaches, intrinsic and extrinsic rewards, incentives, benefits and recognition are becoming the focus of some of the world's best employers[7].

REINFORCEMENT SENSITIVITY THEORY



Flow and peak performance

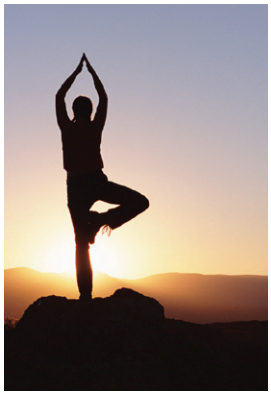
Perhaps you've experienced flow.

You are absorbed in your activity. It may be a sporting passion, a musical endeavor, writing, reading or a project you're working on. It seems to come naturally, effortlessly to you. You almost become 'lost' in the experience – time disappears, you are unaware of potential distractions. You feel energized, elated, alive. You are in 'the zone'.

In his seminal book, ***Flow: the psychology of optimal performance***, Mihaly Csikszentmihalyi describes the eight hallmarks of being in a state of flow[8]:

- working on a challenging activity that requires skills
- being able to concentrate on it
- the activity has clear goals
- it provides immediate feedback
- you have deep but effortless involvement
- you have a sense of control
- concern for the self disappears
- the duration of time is altered.

Flow states are achievable in all aspects of life - work, leisure, relationships. We achieve optimal levels of performance in the flow state: we are more creative, more productive and more satisfied. So it would appear to be a worthy goal to pursue activities that allow flow to manifest. As flow typically results from immersion and heightened focus and attention, this presents interesting challenges in the fast-paced and multi-tasking world of work.

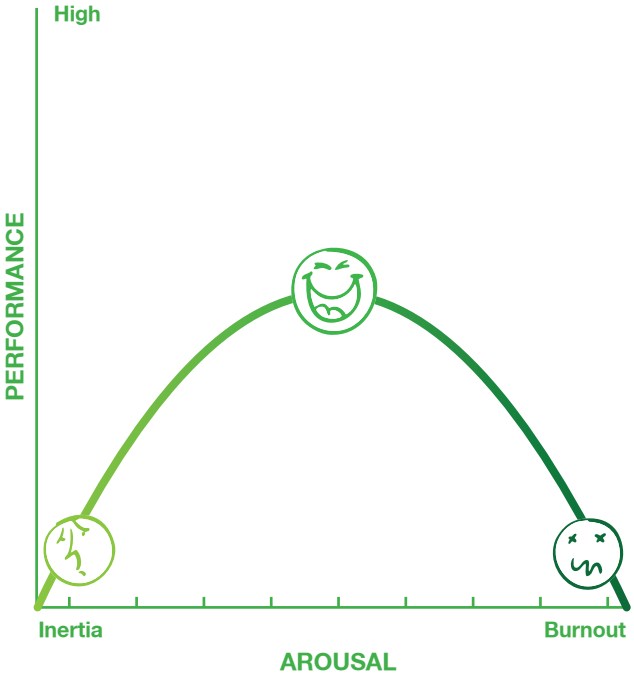


Studies of expert performance, such as in highly accomplished musicians, sports people and mathematicians, show that intuitive processes support linear thinking. This means we tap into all our cognitive resources to achieve top performance, whether engaged in a "left brain" analytical task, or a "right brain" creative one. Experts are better able to tap into their creativity and use their gut instinct. The brains of experts also show greater focus and neural efficiency when applying their expertise. This suggests that the brain performs better and faster in the area of expertise due to structural refinement of neural pathways and networks associated with that area of specialization. Finally, and importantly, expert brains are able to remain 'cool' and focused despite pressure or distraction, and rely on emotional cues for decision-making but regain prefrontal focus before taking action[9].

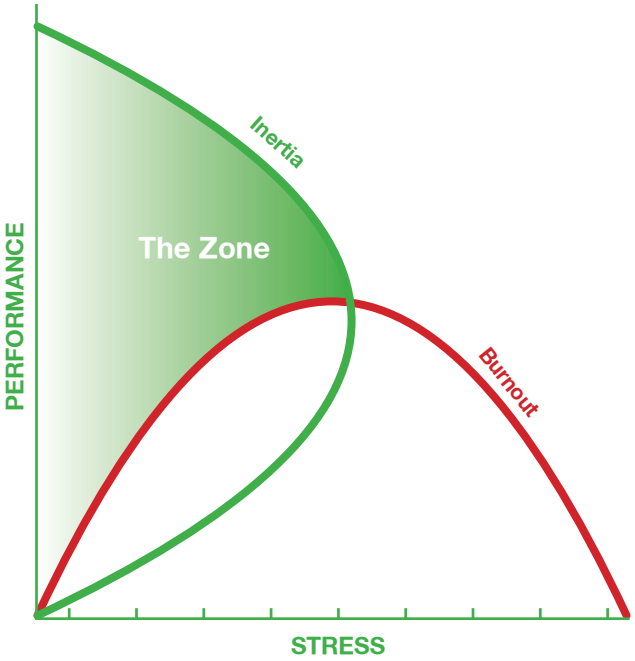
YOU ALMOST BECOME LOST IN THE EXPERIENCE - YOU ARE IN THE ZONE

Optimal arousal and flow

Yerkes-Dodson developed the Optimal Arousal Curve[10] to explain the relationship between levels of arousal (or stress) and their impact on performance. The curve shows that both insufficient and extreme levels of arousal yield the same result: poor performance. High performance requires enough arousal to energize and focus, but not so much that anxiety and panic freeze cognition and action. At the low and end of the curve we are bored and apathetic – yet at the extreme we experience burnout if we are chronically trapped in a high stress environment.



Once again, neuro-chemicals play a key role in our mental state as we respond to stress. The stress hormone cortisol is released into our brain pathways when we exceed our stress threshold, triggering adrenalin release and the fight/flight/freeze response. Burnout occurs because our bodies were not designed to be exposed to these powerful chemicals for more than a very short period of time.



Researcher, Dr Craig Hassed has extended the concept of optimal arousal to build in the effect of flow, or being in 'the zone'. In Hassed's model, being in the zone is represented by both low states of stress and high performance[11]. Quite opposite to the 'adrenalin rush' that accompanies performance under stress, optimal performance occurs when a calm and focused state of mind is achieved. This relaxed mindset can also range across the spectrum, from inertia, apathy or procrastination through to extreme states of immersion and attunement.

Neuroscience has also shown that calm brain states, represented by alpha brainwaves, are necessary to create the conditions for the **aha! experience**, also known as insight, which results from a burst of gamma wave activity preceded by this restful brain state.

Our assumptions about what motivates high performance clearly need to be reviewed. The modern workplace is addicted to activity, speed and short term outcomes. However, contrary to common belief, when it comes to the volume and velocity of brain activation required for us to be at our best, **less is more**.

Part Two: Performance levers

The body and performance

Sleep

In our previous white paper, ***The Neuroscience of Learning & Development***[12], we explored the role of sleep in memory consolidation and learning integration. Research shows the critical role of sleep in the memory encoding process, an essential prerequisite for learning. Here we focus on the role of sleep in cognitive performance. Most empirical studies have addressed this topic via research into sleep deprivation.

What is the effect of sleep loss on our ability to think and perform? Measures of cognitive performance in sleep research focus on tasks requiring attention, working memory, decision making, judgment and memory encoding. In all cases, when we are subject to sleep deprivation, the news is generally not good.

Studies distinguish between **acute sleep deprivation**, defined as short bouts (24-72 hours) of complete sleep loss, and **chronic partial sleep restriction**, defined as continued periods of less than normal quantity of sleep (for example 3-5 hours sleep when the individual's 'normal' pattern is 7-8 hours). Performance in cognitive tasks shows a consistent deterioration in both acute and chronic forms of sleep deprivation. However recovery from chronic partial sleep loss is slower[13]. Age and gender differences have also been noted:

- young adults (under 30 years) perform poorer than their older counterparts (50-60 years) following periods of sleep deprivation – whilst at the same time more confidently and inaccurately overestimating their abilities
- women, whilst reporting more sleep problems than men, perform better than their male counterparts when sleep-deprived.

Other research shows that our ability to accurately detect emotions tied to threat (angry faces) and reward (happy faces), becomes blunted, especially in women, when sleep deprived. This infers that we are less adept at reading social cues and responding appropriately when affected by sleep loss[14].

WE ARE LESS ADEPT AT READING SOCIAL CUES AND RESPONDING APPROPRIATELY WHEN AFFECTED BY SLEEP LOSS.

Current studies are also looking beyond task performance to cognitive performance, showing that the brain's default network (an unfocused state to which we default regularly when not concentrating on anything specific) is also negatively affected by sleep deprivation[15]. Given the default network's role in real-time information integration throughout the day, mental performance would again appear to be compromised.

There is now a compelling body of evidence that ties our performance, be it professional or personal, to adequate levels of sleep. Chronic sleep loss negatively affects focus, memory and cognition, thereby impacting productivity and relationships, and overall well-being.

Nutrition

In addition to sleep, the brain has some other basic requirements essential to its performance. This resource-hungry organ demands approximately 20% of the body's energy output, which explains why we are less focused, tolerant and productive when we are hungry.

Here's why. When we are actively using our conscious brains, many more neurons are firing than when we are at rest. The firing of a neuron is an electrical charge that

travels along the axon of a neuron, which triggers neurotransmitter release at the axon terminal, causing excitation of the next neuron, which continues the chain by sending the next electrical charge. Do this millions of times in a short timeframe and you need a lot of energy. Effectively, the more you are using your conscious brain - for example, to develop a new idea, understand unfamiliar concepts or information, remember, plan, analyze or even inhibit your instinctive reactions in a difficult conversation – the higher the energy requirements of the neurons tasked with completing these actions. This is why we often feel mentally exhausted after a long, hard day.

The body metabolizes nutrients to create energy. The primary source of nutrition for the brain comes in the form of glucose, so it comes as no surprise that maintaining adequate levels must be essential to optimal performance. Numerous studies show the link between glucose and other blood sugars and performance, from normal functioning to elite athletes. Below normal blood glucose concentrations have been shown to result in a 20% reduction in physical performance and similar degradation in cognitive functioning.

Extensive interest and research continues to improve our understanding of the direct effects of diet on the brain. Recent work highlights some of the nutrients necessary for optimal brain functioning:

- **IRON**: numerous studies show improved cognitive performance (memory, attention, concentration and reasoning abilities), particularly in women of reproductive age, when adequate iron levels were maintained[16].
- **FLAVONOIDS**: protect the brain from neurotoxins and can prevent and reverse deterioration in cognitive performance[17]. Foods rich in flavonoids include licorice, green tea, apples, blueberries, raspberries, cabbage, pinto and black beans. Flavonoids are also rich in antioxidants and complement the effects of Vitamin C.
- **FISH OIL**: omega-3 fatty acids are now known to support brain functioning and are particularly important in the developing brain. Omega-3 nutrients are found in fish and sea foods, and poultry and eggs to a lesser degree. Also important are soybean and canola oils[18].

Physical exercise

Exercise is also an important factor in brain function. Regular, moderate exercise oxygenates the blood circulating through the brain and results in numerous benefits. Brain-derived neurotrophic factor (BDNF) stimulates neurogenesis, the growth of new brain cells, and is increased as a result of voluntary physical activity. Exercise also reinforces neuroplasticity, resulting in improved cognitive performance and learning[19].

Studies of aging repeatedly show less age-related brain tissue shrinkage in physically fit subjects compared to sedentary controls. Improved cognitive performance is most evident in executive functions such as attention, planning and organizing when subjects perform a minimum of 30 minutes of aerobic exercise per session[20]. However new studies show that intense and excessive exercise regimes can have detrimental effects on the immune system, depressing immune function and increasing allostatic load [21]. Notwithstanding, the benefits of regular physical exercise on both body and brain are undisputed.

The mind and performance

Multi-tasking and dual task interference

Who hasn't done it? You are driving your car, on your cell-phone, and scribbling down a name or phone number – all at the same time. You are multi-tasking.

It **is** possible to multi-task – in effect, we are doing it all the time: cooking a meal whilst watching television or taking down notes whilst listening to a presentation. This impressive capability can be attributed to your basal ganglia. This complex set of sub-cortical structures stores your life experiences and creates and maintains your habits. The basal ganglia stores the fail-safe programs that allow you to run on auto-pilot. Any action or thought that is repeated numerous times, such as brushing your teeth, typing on a keyboard or knowing that you are bad with street directions, plays like a recorded program that does not even require conscious thought to activate or implement it.

Like an enormous data warehouse, the basal ganglia holds the records of every skill you have acquired, every emotion you regularly experience and every habit, good or bad, you have ever established. Being able run several of these stored programs concurrently means we can multi-task.

Unfortunately, it is the prefrontal cortex, and not the basal ganglia, that you require to hold current information in working memory, consciously process that information and deal with new or complex issues. There is no autopilot here.

Myths of Multi-tasking

Myth: multi-tasking makes you more productive

Fact: Each additional task you undertake concurrently with others reduces performance in them all.

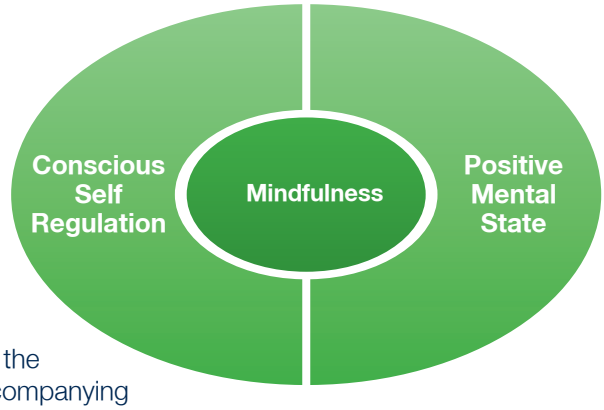
Myth: you can rebound quickly from distractions

Fact: It can take up to 15 minutes to restore concentration following a distraction due to a refractory period in the brain.

While the basal ganglia operates by distributed association and can draw on almost unlimited capacity, the prefrontal cortex operates via serial processing, has limited daily capacity, and struggles constantly with what to prioritise and bring to conscious thought. Requiring a serial processor to multi-task is a tall order. Studies of dual task interference[22] have shown that performance deteriorates significantly as soon as we attempt more than one cognitive task at a time. Even though we can comfortably undertake several programmed tasks simultaneously, this is not true of tasks requiring conscious thinking. Try reading an article while watching the news, or adding a list of numbers while someone is speaking to you. Comprehension and retention on both tasks will be compromised. Recent studies into multi-tasking specifically show deficits in memory and learning when juggling cognitive load.

Despite workplace pressure to the contrary, multi-tasking can be and in many cases is, an impediment to performance.

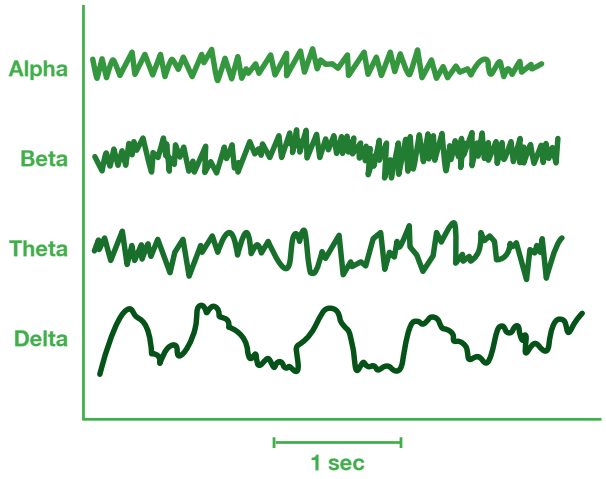
Mindfulness



One of the oldest practices in human history is becoming one the newest breakthroughs in managing thoughts and mental wellbeing. A two-component process, mindfulness involves active self-regulation of thoughts in the present moment, and a positive state orientation[23]. When we are mindful, we are tuned in to the people, conversations and the accompanying emotions in our environment – we are "in the moment". In reality, we spend much of each day **mindlessly** half-listening to conversations, multi-tasking numerous activities and reactively following the bouncing ball as one distraction after another derails us.

Mindfulness requires focused attention. Attention is required for concentration, comprehension and long term memory formation. The brain-wave state associated with alert attention is alpha, which represents a 'quiet brain', in contrast to the busy beta waves of a buzzing brain.

When our minds are shifting from one thought and one activity to the next in rapid succession, we are in a beta state. Studies show that suppression of irrelevant stimuli is a critical factor in task performance: filtering in the right information and filtering out distractions is fundamental to memory and performance[24].



Focus and concentration are can be challenging. We also unwittingly experience 'attentional blink': a gap in our concentration of up to half a second before we are able to receive further information[25]. All these factors result in the mental distractions we experience thousands of times a day, potentially reducing our effectiveness and performance.

Mindfulness training uses mediation techniques to build attentiveness and alpha wave concentration. With its roots in eastern Buddhist meditation, mindfulness is simply the nurturing of focus in the present moment, connecting with the sensory environment, giving awareness to the 'now'. And practicing mindfulness has an intriguing positive effect on performance. The structure of neural connections changes and strengthens in those that regularly engage in mindfulness practice. In fact, the brains of meditators show greater cortical thickness (neural density) than those of non-meditators[26]. Studies have also shown distinctly different neural activation patterns in participants who have undertaken mindfulness training[27] and that such training, even for short durations, can lead to significantly improved levels of attention and emotional regulation[28].

There is empirical evidence that mindfulness[29]:

- reduces the physiological and psychological effects of stress
- correlates with emotional intelligence, and
- improves well-being and happiness.

Organisations such as Microsoft have incorporated mindfulness training into their leadership programs to take leaders to the next dimension of personal and professional development[30]. This low key, no cost, minimal effort technique appears to have tremendous influence on our mental wellbeing, and offers real results for those seeking to increase their effectiveness across all aspects of life.

Brain training

Somewhat controversial is the contribution to cognitive performance of brain training, which is experiencing a surge in popularity. Based on the principle of "use it or lose it" a plethora of brain training models and interventions are now readily available. Brain training methods aim to challenge participants in verbal, numerical, visual and spatial tasks, with the predominant goal of improving attention and memory.

Brain training is purported to tap into the brain's natural neuroplasticity: neurons are continually 'rewiring' through the process of learning. Structural changes occur in the brain as a result of this plasticity, and brain training advocates hope to generate new neural pathways as well as reinforce existing ones, through the conscious activation and 'exercising' of these brain cells.

One of the challenges with effective brain training is the practice effect, as the brain is particularly adept at 'hard-wiring' any cognitive or motor skill that is the subject of repetition. Studies of brain training efficacy also question the transfer effect: does brain training improve generalized cognitive function, or only performance on the specific tasks that are the content of the training?

For now, the jury is out on the long term advantages of brain training. That said, it is certain to do no harm, and future research into neuroplasticity should result in emerging methods that tap into the brain's natural propensity to learn.

The performance environment

Leadership impact

Leadership models have evolved over the past half century, predominantly focused on defining the key behavioral attributes of effective leaders, as determined by their impact on the performance of individuals, teams and organizations. From situational leadership (Blanchard) to transformational leadership (Burns) to emotional intelligence (Goleman), leadership models have aimed to guide behavior to toward optimal performance.

Situational Leadership	Transformational Leadership	Emotional Leadership
Directing Coaching Supporting Delegating	Idealized influence Inspirational motivation Intellectual stimulation Individualized consideration	Self awareness Self regulation Self motivation Social awareness Social skills

Empirical studies have shown that effectively executed behaviors underpinning transformational leadership[32] and emotional intelligence do, in fact, positively impact performance.

The application of neuroscience to the domain of leadership has spawned the new and specific academic field of Neuroleadership[33]. The neuroscience perspective on leadership differs from behavioral approaches insomuch as it aims to identify the biological basis for behavior and how this subsequently translates to the performance of leaders and their impact on others. In this way, neuroscience seeks to explain, not just describe, leadership behavior and human performance.

In our first white paper in the neuroscience series, ***The Neuroscience of Talent Management***[34], we introduced the SCARF Model[35] as a method of understanding how threat and reward are manifested in the workplace – here we use it to understand the impact a leader may have on individual, team and organizational performance.

LEADERS PLAY A CRUCIAL ROLE IN CREATING ENVIRONMENTS THAT FOSTER THREAT AND/OR REWARD

Leaders play a crucial role in creating environments that foster threat and/or reward. There are direct implications on the performance of individuals and teams exposed to these environments. In a state of threat, the prefrontal cortex, with its conscious and controlled thinking processes, is effectively shut down by the significantly stronger forces of the limbic system. This subconscious brain region bases thinking on automatic patterns that have been 'tried and true', as well as self preservation in the face of the perceived threat. As a result, performance is driven by fear or anxiety, inducing the stress state (in turn releasing the stress chemical cortisol), which was earlier shown to compromise performance outcomes.

When employees work with a leader that promotes reward states, the opposite psychological and physiological effects occur. The prefrontal cortex is active and integrates positively with the limbic system. The reward chemical dopamine is released into the central nervous system in response to engagement in a challenging but supportive environment, and optimal performance can be achieved.

Leaders have significant influence on the conditions in which employees work, for better or for worse. Actions leaders can take to create threat or reward states include:

Threat		Reward
Reducing self esteem or self worth through personal criticism, removal of status symbols or lack of recognition	S Status	Personal recognition for effort and outcomes, positive feedback, acknowledgment of expertise, public praise, professional development
Destabilizing employees through continual or unexplained change, shifting goal-posts or inconsistent behavior	C Certainty	Role clarity, open communication, agreed performance expectations, regular feedback, predictability
Micro-managing employees, undermining delegated authorities, bureaucratic restrictions, 'one-size-fits-all' approach	A Autonomy	Freedom of choice within role scope, authority to match responsibilities, outcome versus process focus
Failing to value the importance of personal relationships on teamwork, customer service, morale and engagement	R Relatedness	Encouraging team engagement, respecting personal values and needs
Favoritism, bias, inconsistency, failure to 'walk the talk'	F Fairness	Equitable processes, merit-based decisions, open communication

It is through the influence they have on others that leaders are seen to be in a position of power. Leaders can unleash optimal performance in their employees when they exert this power in ways that inspire and support, rather than threaten and demoralize, their teams.

Social connections

People work for many complex reasons that are beyond the scope of this paper. From a neuroscience perspective, the workplace provides a forum for our need to build social relations as well as our aspirations for meaning and purpose.

Research now clearly highlights that the human brain has evolved advanced circuitry dedicated to our social connections, on par with other survival instincts such as the need for food and water. Pain receptors in the brain activated by physical pain sensations are equally activated by social pain, such as rejection or personal criticism[36]. This highlights that the workplace can be a source of great social satisfaction or disappointment, depending on what we experience.

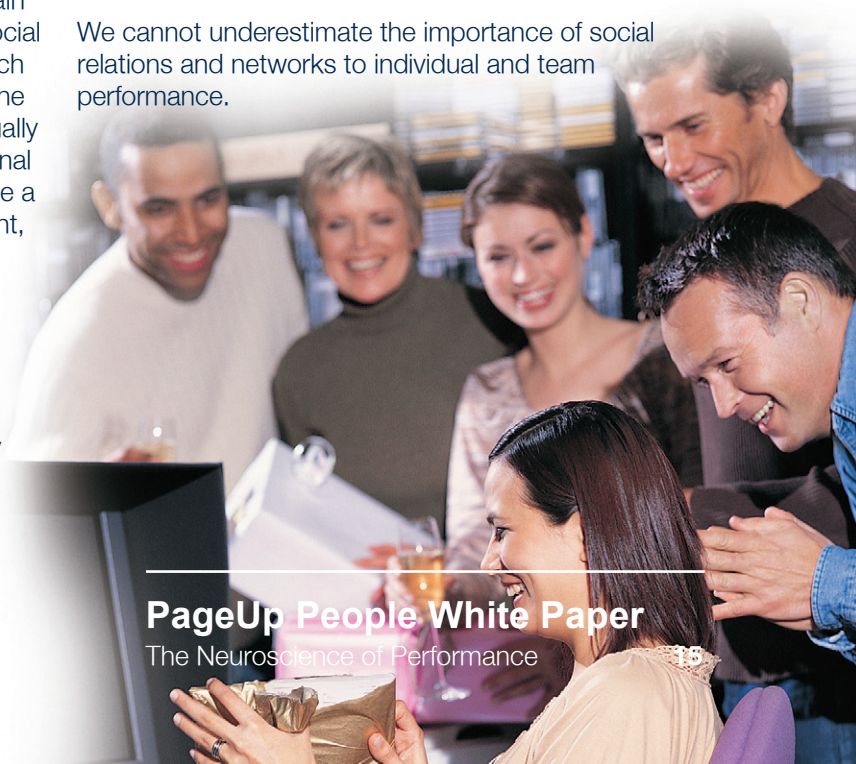
Best practices are highlighting the need for performance management processes to be more 'collaborative' in both their design and implementation[37], including:

- aligning goals more collaboratively and frequently
- supporting better performance communication
- helping managers have better performance conversations, and
- improving the link between performance and development

All these activities relate to the 'soft skills' of performance management, rather than process and compliance.

The workplace hones our interpersonal skills. It is the place in which we will experience achievement with and through others, diverse opinions and ideas and challenging conflicts. We develop distinct neural networks through our workplace interactions, to refine abilities such as empathy, emotional regulation and social cohesion. We learn how to relate more effectively, influence others and temper our instincts.

We cannot underestimate the importance of social relations and networks to individual and team performance.



Part Three: Organizational practices

What's wrong with performance management?

A recent worldwide survey of nearly 400 organizations confirmed that the impact of the global financial crisis translated into even higher productivity and performance demands from fewer employees, whilst still pursuing business growth. Aligning business goals to individual performance, leveraging process efficiencies and fostering high performance cultures are seen to be key to survival in our post-GFC world[38]. The business case for performance management is clear.

"Perhaps no talent management process is more important or more reviled than performance management"[39]. It appears that despite common agreement that setting goals and measuring their achievement are critical management functions, the past few decades of advances in performance management models, processes and technology have done little to advance satisfaction with this universal organizational activity.

Factors continuing to contribute to dissatisfaction with organizational performance management include:

- static annual events rather than real time dynamic exchanges (for both goal setting and performance reviews)
- poor line of sight between organizational and individual performance goals
- disconnect between performance management, learning and development and career planning
- insufficient skills or support for managers and employees to implement the process effectively
- timeliness, accessibility and engagement.

Most approaches to performance management still place their emphasis on process and mechanics at the expense of communicating clear and simple messages and engaging employees to achieve their own performance potential. Process rigidity, complexity and formality and poor communication skills repeatedly surface in surveys of dissatisfied performance reviewers and reviewees.

If the diagnosis is clear, corrective remedies should be within our reach to source and administer.

THE RESULTS OF PERFORMANCE FEEDBACK HAVE TO MAKE YOU WONDER:

30% LEADS TO IMPROVEMENT

30% HAS NO EFFECT

40% MAKES THINGS WORSE

Performance feedback

Whether giving or receiving it, adverse performance feedback appears to have the uncanny effect of evoking a threat state in just about every human being. Holding the 'difficult discussion' creates tension, and for some, anxiety, often disproportionate to the weight or implications of the feedback.

Goal setting appears to be better accepted and executed than the review and feedback process. When there is negative content in feedback, studies show that the benefit of receiving it, in order to improve future performance, for example, is limited by[40]:

1. failure to obtain it (recipients avoid receiving it to maintain self esteem, and givers avoid offering it because they know it is both painful and usually unwelcomed), and
2. failure to accurately appraise the feedback (by relying on non-content cues, effects of low self-esteem or perceptions of high performance).

Even more concerning is that increases in interventions to improve performance management appear to have had counterproductive results. Certainly, the results of performance feedback have to make you wonder: in a meta-analytic study of performance feedback interventions, it was concluded that while 30% of such interventions improve performance, another 30% have no effect and 40% actually make things worse[41]. Feedback was most likely to generate positive outcomes when it was directed at the task rather than the attributes of the individual.

Performance feedback requires that we confront information that, no matter how objective, unleashes subconscious emotions. This limbic response is instant and difficult to suppress, and the more we perceive to be at stake, the harder it is. At the core of our reactions to feedback is the complex and critical role social relationships have on the brain.

Multi-sourced feedback

Multi-sourced feedback (MSF) in the context of performance management has been the source of some controversy in the field of human resources management. Most frequently used to constructively identify development needs and inform an individual development plan, MSF and performance appraisal do have common aspects.

A review of MSF literature and applied practice highlights the following common attributes[42]:

- the need for organizational context, and specifically how the feedback relates to organizational and individual goals, as well as alignment with other human resources activities
- the need for trust and honesty in feedback gathering and communication
- individual differences matter: better responses to feedback occur when individuals:
  - have high self esteem and an internal locus of control
  - demonstrate the traits of extraversion and conscientiousness
  - have a learning goal versus performance goal orientation
- negative feedback is considered to be less accurate than positive feedback, and likely to anger and discourage
- follow-up post feedback is critical
- feedback is linked to subsequent goal-setting.

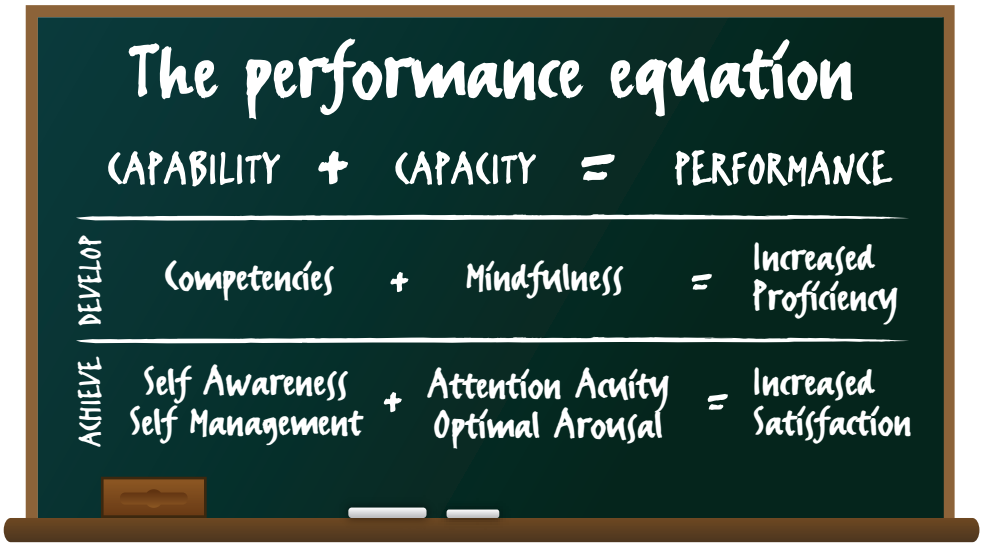
Implemented well, MSF provides layered feedback points that can increase an employee's responsiveness and commitment to improve. It can also have the positive effect of reinforcing an open feedback culture.

Improving individual performance

In order to maximize performance and achieve potential, there has been a concerted focus on the development of **capability**: skills and behavioral competencies. This is true at all levels, from teamwork, sales and customer service, to management and leadership development.

The development of capability does not, however, address the aspect of **capacity**: the ability to process, store and integrate these capabilities and apply them effectively. It is through attention to our cognitive processes that we can enhance our mental capacities, through practices such as mindfulness training. The combination of developing both **capability and capacity** is seen as the next level of performance enhancement[43].

This can be presented in the form of an equation, in which the sum total of developing capability (represented by technical and behavioral competencies) and capacity (represented by mindfulness training and practice) result in heightened performance (observed in both proficiency and job satisfaction).



This recognizes that the absence of any component means the equation cannot be solved. By developing a leader's capability, for example, he achieves heightened states of awareness of what effective leadership is, as well as how to change or manage his behaviors that reflect this. Many leaders have undertaken numerous such programs over the years and built considerable **proficiency** in their leadership capability.

THE COMBINATION OF DEVELOPING BOTH CAPABILITY AND CAPACITY IS SEEN AS THE NEXT LEVEL OF PERFORMANCE ENHANCEMENT

Less, if any, attention has been placed on that leader's **capacity to implement their leadership capability**, which is a distinct skill and mindset. Capacity is a function of the leader's ability to focus and attend to performance-relevant tasks and activities for themselves and their teams, as well as managing personal stress to optimize effectiveness. Managed well, this contributes to the leader's job **satisfaction**, which in turn reinforces the positive performance cycle. Advanced leadership and professional development should address all factors in the performance equation.

Creating high performance workplaces

How would you define a high performance workplace? No two workplaces are exactly alike and therefore no one-size-fits-all answer applies, however there are certain elements associated with highly productive work environments that consistently appear in the research[44, 45]:

Challenge

Nothing inspires focus, commitment and discretionary effort more than a lofty, worthwhile cause. When we buy in to a mission or goal, we rise to the challenge. When the challenge taps our skills and provides stretch, we experience flow and high performance results.

Focus

A narrow field of focus allows for concentration of effort, immersion in the task and deep learning. Workplaces that recognize the performance diluting effects of distraction and overload value the cognitive needs of employees to produce their best work.

Teams

We integrate ideas and are energized by our connections to others and engagement in team goals. Our primal need to be accepted by and contributing to a social structure, makes teamwork a preferred and natural environment in which humans thrive. Constructive and open feedback reinforces team effectiveness.

Support

Fear destroys initiative and creativity and forces protective behaviors that suffocate optimal performance. Employees need to feel safe, encouraged and guided when they need help. Support also includes access to resources necessary for goal achievement.

Autonomy

There is clear evidence that employees are more productive and engaged when they can exert influence and discretion appropriate to their experience and knowledge. Autonomy recognizes expertise, demonstrates trust and belief in others abilities, and ensures that ownership of the problem and solution sits with employees.

Organizations have the opportunity to think strategically about job design, performance measures, workplace structures and leadership values and behaviors, all of which can contribute to creating a workplace conducive to high performance.

Closing comments

At the heart of human satisfaction is what we achieve, individually and together. Performance therefore, is not something that needs to be demanded, enforced or driven: it occurs through intrinsic motivation and our yearning for meaning and purpose. We strive to perform and achieve our potential.

Neuroscience is beginning to show what biological factors are at work when we experience the pains and pleasures of success and failure. Embedded in our DNA and reinforced and expanded through learning, are the physiological and psychological states that contribute to our performance.

We can only be dissatisfied with performance management in the workplace because our systems and processes fail to tap into the essence of what really drives performance. Science is now highlighting some of these driving factors, which will serve to inform future organizational practices. With this will evolve new paradigms of work and interaction, creating the possibility for performance levels rarely achieved in the present day.

Interesting reading

On understanding the brain:

Tell-tale Brain: Unlocking the Mystery of Human Nature
V.S. Ramachandran

On leadership and the brain:

Your Brain & Business: The Neuroscience of Great Leaders
Srivinvasan S. Pillay

On mindfulness:

Wherever you go, There you are
Jon Kabat-Zinn

Mindsight: Change your Brain and your Life
Daniel J. Siegel

On talent management:

Workforce of One: Revolutionizing Talent Management Through Customization
Susan Cantrell & David Smith

One Page Talent Management: Eliminating Complexity, Adding Value
Marc Effron & Miriam Ort

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