

# TARA SWART

— NEUROSCIENCE ♦ LEADERSHIP —

STUDY INTO THE MENTAL RESILIENCE OF JOURNALISTS

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## Executive Summary

### Background

90 journalists applied to take part in the study (although a number of others self-excluded due to anti-depressant use). 40 journalists were selected on a first come first served basis, from across newspaper & magazine, broadcast and online. Ultimately, failure to complete all the elements in the required time limit meant that a total of 21 participants completed every element, and a further 10 completed some elements of the study.

The study was based on a programme called Leading Sustainable Performance designed by Dr Tara Swart which she ordinarily runs with leadership teams in banks and large corporates.

It was performed over a period of 7 months, during which time a group of journalists undertook a series of simple tests to record various data relating to their lifestyle, health and behaviour. Journalists then met with Dr Swart for an individual session during which their results and specific experiences were discussed in depth.

Tests that journalists undertook were:

- Completing a blood test;
- Wearing a heart-rate variability monitor for three days;
- Keeping a food and drink diary for seven days; and
- Completing a brain profile questionnaire.

Provision of blood test kits and heart rate variability devices was arranged by LiveSmart and FirstBeat respectively, and brain profiles were supplied by Neurozone.

### Journalist Profile

The study was borne out of a desire to look at professions which appear to be subject to a particularly high number of stressors. Journalism has a reputation for being a high-pressured line of work, yet this aspect of the job doesn't receive much attention in the same way that stress experienced by bankers and lawyers does. Elements that contribute to journalism being a stressful profession include:

- Deadlines
- Accountability to the public
- Heavy and unpredictable workloads
- Public scrutiny, compounded by social media
- Poor pay

### Hypothesis

It was therefore expected that the study results would display a number of factors to indicate high stress levels amongst the group, for example:

- High levels of the stress hormone cortisol in the blood
- A distinct risk appetite profile, as indicated by testosterone levels
- Increased signs of stress based on heart rate variability data around deadlines
- Fewer hours of sleep or lack of good quality sleep
- Poor recovery levels during the working day

## Results

Results indicated that, on average, the journalists who participated were no more physically stressed than the average person. Blood test data, which would have shown high levels of cortisol to indicate stress, was mostly normal – save for two anomalies, one showing high cortisol and the other high testosterone levels.

Anecdotally, a high proportion of the group reported experiencing some stress, but often cited factors other than their job, including family and finances, as being the cause of this. This was supported by heart rate variability data in several instances indicating a higher degree of stress during hours spent at home. The demands of digital were often cited as contributing to feelings of stress at work.

**The headline conclusion reached is that journalists are undoubtedly subject to a range of pressures at work and home, but the meaning and purpose they attribute to their work contributes to helping them remain mentally resilient despite this. Nevertheless, there are areas for improvement, including drinking more water and reducing alcohol and caffeine consumption to increase executive functioning and improve recovery during sleep.**

Findings from the data collected have been pulled together below into four areas where particularly interesting observations were noted: (1) Brain Performance (2) Alcohol and Hydration (3) Stress & Recovery and (4) Age.

- (1) **Brain performance:** Most of the journalists spoken to indicated that they enjoy their job. The strength of the axis between “value-tagging” and “abstraction” in the brain profile data collected – more detail on which is included in section (1) below – indicates high levels of meaning and purpose within the group. “Meaning” in this context is a feeling that there is a point to what one is doing; it is subjective. Research on neuroeconomics (see Dan Ariely, Emir Kamenica and Drazen Prelec. 2008. *"Man's search for meaning: The case of Legos"* Journal of Economic Behavior & Organization, vol. 67, issue 3-4, pages 671-677) has shown that people who do a job which they feel has noble goals are more likely to do it for less money, and are more likely to have increased productivity. **A connection can therefore be drawn between the level of meaning and purpose that journalists feel their job has, and their ability to remain productive and endure the challenges thrown at them.**
- (2) **Hydration:** Less than 5% of the journalists drank enough water each day and higher-than-recommended weekly levels of alcohol were consumed, which contributed to poor recovery levels during sleep. On an individual level, where high quantities of caffeine were consumed, this correlated with higher reported stress and physical manifestations of stress (increased heart rate variability and higher cortisol levels). As a group, the journalists also exhibited lower executive functioning scores than the average person, indicating a lower than average ability to regulate emotions, suppress biases, solve complex problems, switch between tasks, and think flexibly and creatively. **It is likely that the levels of caffeine/alcohol and the lack of water consumed contributed to the low scores recorded for executive functioning because of the severe impact of dehydration on cognitive ability.**
- (3) **Stress & Recovery:** The journalists’ heart rate variability data exhibited broadly average levels of stress and recovery per day. Of note, however, was that **over a quarter of the journalists had poor recovery during sleep owing to a number of reported factors including alcohol consumption, caffeine intake, eating late and disturbances from children.**
- (4) **Age:** Although results were compared across different types of journalists, age was more of a distinguishing factor within the group. Of the journalists tested, 50% were over 35 and 50% were under 35. Older journalists exhibited less stress than their under 35 year old counterparts and had better recovery data, indicating higher levels of resilience. **The conclusion is that older journalists were better able to endure stress and bounce back from pressure, indicating that this can be developed over time.**

# Group Observations

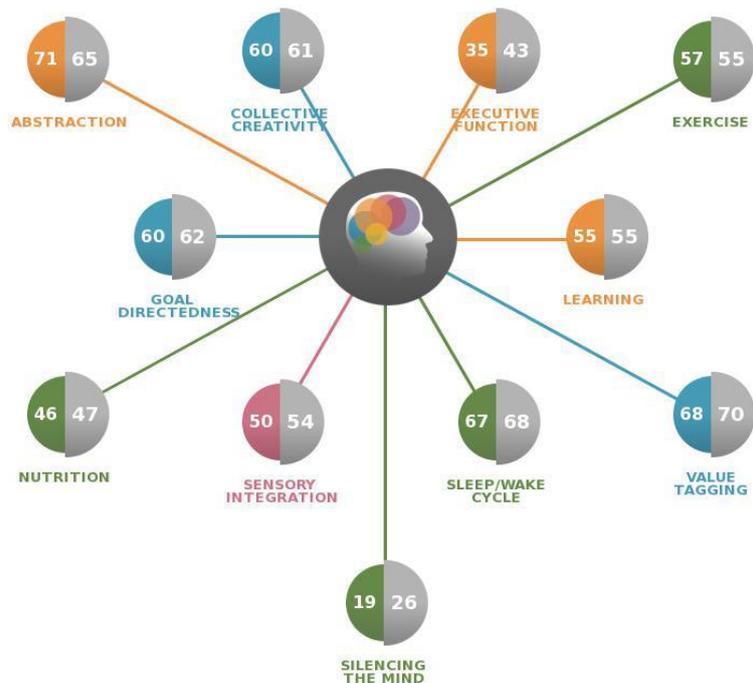
## 1. Brain Performance

Journalists were asked to complete a Neurozone brain profile which required them to self-report their behavioural states for a number of malleable behaviour classes (the outer sphere below) which, when the recommended threshold has been met, lead to enhanced brain performance. The inner sphere represents the four conditions for brain performance, which allow the thriving brain to move into a relaxed physiological state, alert and ready to perform at an optimum to overcome challenges from basic to sophisticated.

Note: see **Appendix 1** for a full explanation of each behaviour class.



The comparative brain performance opportunity profile below shows the **journalists'** group performance compared to the **average**. The left half of each circle indicates journalist data, with the right indicating the norm.



Particularly high scores were recorded for:

- **Abstraction.** Abstraction draws upon knowledge (the building blocks of innovation) and largely takes place in the dorsolateral pathways. These pathways are sometimes referred to as the 'super highway' en route to the dorsolateral prefrontal cortex, where the most sophisticated problem solving takes place. Abstraction is the capacity to make novel internal representations of the possible, a result of accurately grouping non-obvious patterns and their relationships.  
**High scores for abstraction indicate an ability to think outside of the box and make connections where others might not see them.**
- Also of note is the connection between abstraction and value-tagging via the central axis. The journalists exhibited scores of 68 for value-tagging (the average is 70), however follow up conversations with journalists indicated that a few low scores may have skewed the average and that these low scores were consistently for personal reasons rather than work reasons. Value tagging is facilitated by the amygdala, ventromedial pathways and the ventromedial prefrontal cortex. These structures are richly interconnected with the dorsolateral pathways and the dorsolateral prefrontal cortex (problem-solving machine), and they screen solutions for relevance and appropriateness. Value tagging allows the brain to assign a value to each sensory cue. The brain considers both 'cold' values, such as "is this a priority?", and 'warm' values, such as "does this give me meaning?" and "do I belong?".  
**High scores for value tagging indicate an ability to sift through information and pick out what is pertinent, as well as high levels of meaning and purpose.**

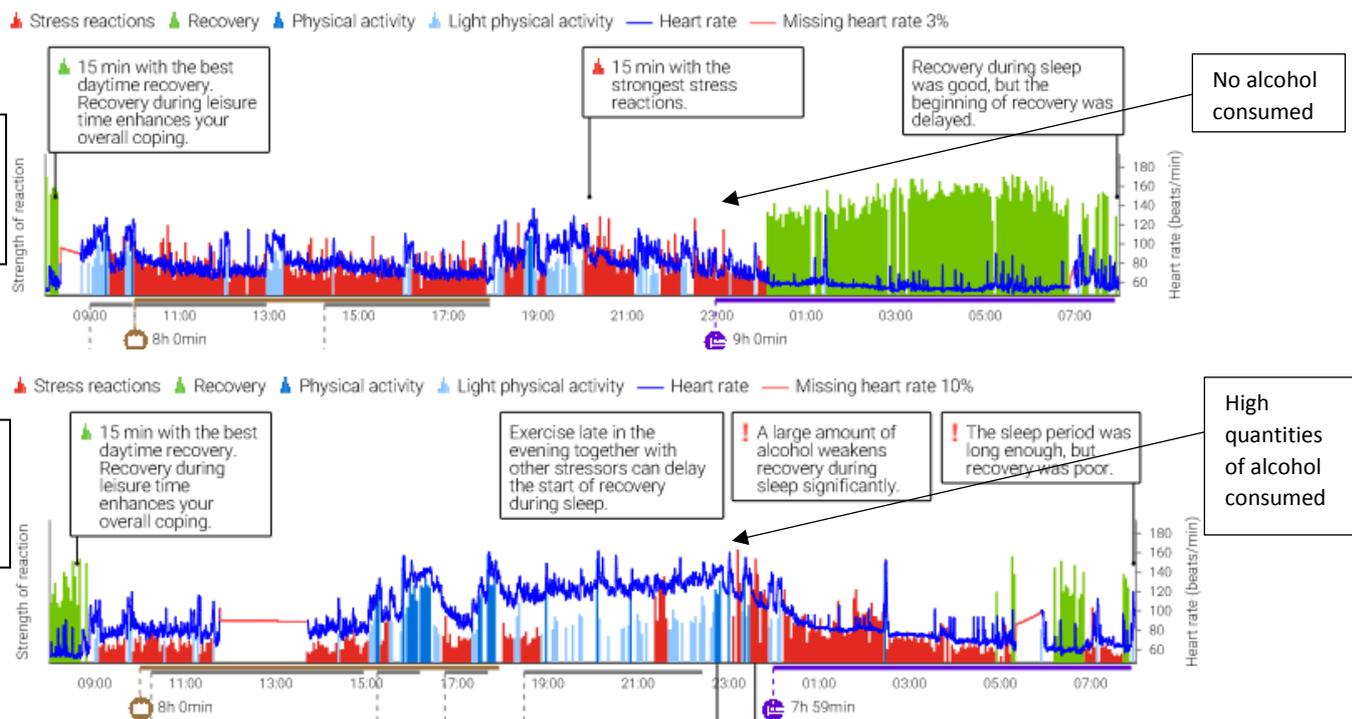
Particularly low scores were recorded for:

- **Executive Function.**  
Executive function is assigned to the dorsolateral prefrontal cortex (outer top part of the frontal lobe). Regarded as the CEO of the brain, it is where the most sophisticated and enriched thinking takes place. The dorsolateral prefrontal cortex is interrelated with the ventromedial prefrontal cortex (inner bottom part of the frontal lobe). Important aspects of executive function include working memory, focus and sustained attention.  
**Low scores for executive functioning indicates less of an ability to regulate emotions, suppress biases, solve complex problems, switch between tasks, and think flexibly and creatively. Sleep, nutrition, exercise and mindfulness all drive executive function, and failure to perform these basics can cause avoidable decreases in cognitive performance. Many journalists reported no time for breaks, as well as low sensory integration, which can also negatively impact on cognitive performance.**
- **Silencing the Mind.**  
This behaviour refers to purposeful sessions to enhance focus and/or to allow thoughts without reacting, thereby preventing worrying about the future or regretting the past (i.e. the practice of mindfulness). Mindfulness promotes a relaxed physiological state at the level of the hypothalamus and amygdala and enhances the ability to focus and sustain attention at the level of the dorsolateral prefrontal cortex. It promotes brain cell formation in the hippocampus and reduces the sensitivity of the amygdala, calming it down and promoting clarity of mind.  
**Low scores for silencing the mind indicates a lack of mindfulness practice amongst the surveyed population. This can manifest itself in reduced executive functioning, which corresponds to the result above. Studies have shown that just 12 minutes of mindfulness a day or 30 minutes of mindfulness 3 times a week thickens the folds of the pre-frontal cortex enhancing executive function.**

## 2. Hydration

Food diaries showed lower levels of water and higher levels of caffeine and alcohol consumption than recommended.

- Less than 5% of journalists drank enough water (recommended at approximately 8 glasses a day, or 500ml for every 15kg of body weight).
- On average journalists drank around 3 glasses of water a day equating to approximately 750ml – 1l. This is about half of what is recommended to ensure the brain remains hydrated. In a number of instances the amount consumed was considerably lower.
- 69% of journalists drank more than 2 cups of caffeine a day on average.
  - This level was even higher in those under 35 where the average was 72%. Drinking high amounts of caffeine might offer a short-term boost, but can be detrimental longer term by dehydrating the brain and having a negative impact on quality of sleep.
- 27% of participants drank alcohol on 5 or more days a week. 41% drank 18 or more units a week.
- On average, journalists drank 14.7 units a week (the recommended weekly allowance is no more than 14 units per week). After removing results of journalists who didn't drink alcohol at all, the average units drunk per week was 16 units.
- Where alcohol was consumed, sleep was disturbed and heart rate variability data indicated increased levels of stress for the body. This is because of the physiology of the body in breaking down a toxin; the liver works harder when it should be resting, leading to a stressed state. Over ¼ of journalists had poor recovery during sleep. See report excerpts below from the same participant taken 1 day apart to demonstrate effect of alcohol on recovery.



Alcohol is a depressant and neurotoxin, which means it slows down the brain and the central nervous system's processes by depressing electrical conductivity in the brain. It also contributes to dehydration; as little as a 1-3% change in hydration levels can result in lower physical, visuomotor, psychomotor and cognitive performance. Dehydration can also significantly impair short term memory capability.

### 3. Stress & Recovery

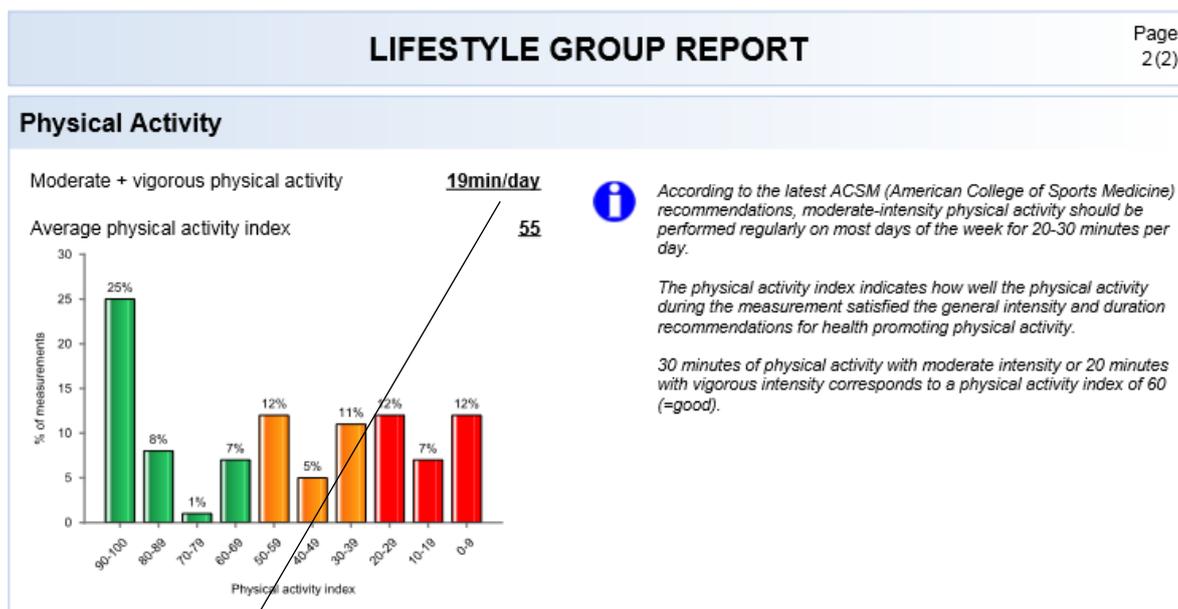
Journalists wore Heart Rate Variability Monitors for a period of 3 consecutive days during the day and night. They were also required to submit key information about their sleep, wake and exercise times. Heart rate variability data measures the autonomic nervous system by picking up nerve activity around the heart. It is therefore an extremely helpful indicator of mental activity.

Overall stress and recovery were around average, with **average share of stress in a 24 hour period at 51%** and **average share of recovery in a 24 hour period at 23%**. However recovery during sleep was low.

- **Stress** in this context means an elevated activation level in the body. The reaction can be positive or negative. On average there are 50% of stress reactions in a 24-hour period.
- **Recovery** means a calming down of the body. Important recovery period include sleep and peaceful moments during the day. On average, there are 26% of recovery reactions in a 24 hour period.

Physical activity was lower than recommended (20 minutes of vigorous or 30 minutes of moderate physical activity is recommended per day). As well as being important for physical health, the benefits of physical activity on mental performance are multiple. Exercise can have the same effect as a low dose of anti-depressants. It also helps to reduce levels of the stress hormone cortisol, which is literally sweated out during physical exertion.

Under 35s achieved above the lower end of recommended physical activity per day (an average of 24 minutes per day). Over 35s exhibited less than the recommended amount (an average of 13 minutes a day).



Below recommended physical activity

Below recommended recovery during sleep

### LIFESTYLE GROUP REPORT

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<b>Tara Swart Journalist Study 2016</b>		Physical activity index	Amount of recovery during sleep (%)	Quality of recovery (RMSSD)
Reporting date	10 Mar 2017			
Assessments	24			
Measurements	75			
Average age	38			
Average Body Mass Index	23.3			
Measurement lengths	5h 24min - 30h 28min			

Slightly above average stress

### Overall Stress and Recovery

Average share of stress per day: **51%**

Average share of recovery per day: **23%**

**Average values of stress and recovery in Firstbeat database**  
 Stress: 50%  
 Recovery: 26% (Firstbeat recommends at least 30%)  
 (Source: Firstbeat user database 2016)

Below average recovery

### Recovery During Daytime

Average recovery during leisure time: **51min**

Average recovery during work time: **22min**

26% poor recovery during sleep

### Physiological Reactions During Sleep Periods

Average share of recovery during sleep: **62%**

Average quality of recovery (RMSSD): **49**

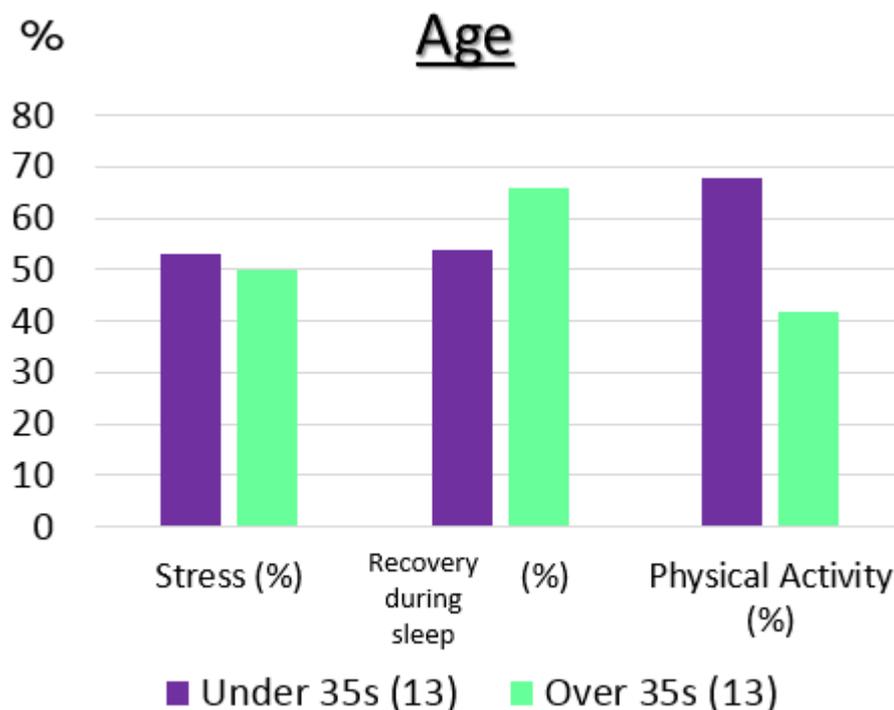
Average time used for sleeping: **7h 31min**

Just over the recommended minimum amount of sleep (7-9 hours)

#### 4. Age

Interesting differences were observed between age groups within the group of journalists. **The heart rate variability data indicates that older journalists on average had better recovery than younger journalists.**

- Interestingly over 35s spent more time in recovery – a calm state indicating recouping of mental resilience - than the under 35s.
  - Average share of recovery per day for over 35s was at 26%
  - Average share of recovery per day for under 35s was at 19%
  - At least 30% is recommended, so 19% indicates a much lower than average share of recovery.
- More participants under 35 also reported feeling stressed than participants over 35.
- Brain profile data indicated:
  - <35 journalists have an exercise routine which is significantly more diverse than >35s. Older journalists are more set in their ways in terms of exercise, while younger journalists are still in the experimentation phase it would appear.
  - >35 journalists have a significantly more consistent healthy breakfast eating routine than their younger counterparts.
  - <35 journalists have significantly more destructive habits like smoking etc. than older journalists.
  - >35 journalists have more confidence in themselves in terms of their expectations of their performance.



## APPENDIX 1

Drivers of Brain Performance: These are malleable behaviour classes which has been shown to lead to enhanced brain performance. They include:

**Exercise:** As a foundational driver of brain performance, exercise stimulates the formation of new brain cells in the hippocampus, a brain structure critical for building memory and knowledge. Exercise also moves the brain into a relaxed physiological state and reduces chronic stress through its variety of beneficial effects on the three interconnected structures (hypothalamus, amygdala and hippocampus), as well as the brainstem. It further enhances creative problem solving in the dorsolateral prefrontal cortex.

**Nutrition:** Fuelling the brain properly requires continuously available glucose (carbohydrates). The brain constitutes 2% of the body mass yet uses 20% of its energy, underscoring the need for a continuous supply of fuel. The brainstem and hypothalamus regulate cyclical intake of nutrients, while low GI type foods ensure a sustained supply of energy for brain and body.

**Sleep/Wake Cycle:** Sleep is a rhythm as essential as breathing and heartbeat, except that its rhythm is an optimum 7 to 9 hours in 24. But we don't just sleep to rest. Sleep and wake cycles are both highly active brain states regulated by the hypothalamus and brainstem. During sleep the brain builds and consolidates memory via the hippocampus and facilitates challenging problem-solving at the level of the dorsolateral pathways and dorsolateral prefrontal cortex.

**Silencing the Mind:** With Silencing the Mind we refer to purposeful sessions to enhance focus and/or to allow thoughts without reacting, thereby preventing worrying about the future or regretting the past (mindfulness) if you silence your mind for just 15 minutes daily it will positively affect the whole brain/body system. Among its many benefits, it promotes a relaxed physiological state at the level of the hypothalamus and amygdala and enhances the ability to focus and sustain attention at the level of the dorsolateral prefrontal cortex. It promotes brain cell formation in the hippocampus and reduces the sensitivity of the amygdala, calming it down and promoting clarity of mind

**Value Tagging:** Value tagging is an unconscious process that precedes every action. The brain assigns a value to every sensory cue. It asks: Do I belong here? Is this me? Does this give me meaning? The amygdala, ventromedial pathways and the ventromedial prefrontal cortex facilitate value tagging. These structures are richly interconnected with the dorsolateral pathways and the dorsolateral prefrontal cortex (problem-solving machine) and screen solutions for relevance and appropriateness.

**Goal Directedness:** Goal directedness is an unconscious brain state essential for goal achievement. This is not the same as goal setting. Simply put, our goal is to stay alive, survive and ultimately to thrive. To achieve this, the brain has developed a system that avoids threats and seeks rewards. The striatum (not shown here) directs our attention to stimuli. In addition, the amygdala, ventromedial pathways and ventromedial prefrontal cortex play an important role in goal-directed behaviour

**Collective Creativity:** In neuroscience, collective creativity is defined as the ability of a group to solve problems and fashion novel products that are adaptive for the survival and thriving of the group. For the individuals that are part of a collectively creative group, chronic stress is reduced at the level of the amygdala and hypothalamus. At the same time, collective creativity also enhances individual problem-solving ability by putting the dorsolateral prefrontal cortex in control.

**Learning:** The brain learns and builds new knowledge by forming memories. The hippocampus is the key structure in this process. It feeds knowledge to the appropriate long-term memory sites where it can be used as the building blocks of innovation. Learning can be enhanced through a process called neuroplasticity (ability to form new brain cells and brain circuits). This happens especially in the hippocampus.

**Abstraction:** Abstraction is the capacity to make novel internal representations of the possible, a result of accurately grouping non-obvious patterns and their relationships. Abstraction draws upon knowledge (the building blocks of innovation) and largely takes place in the dorsolateral pathways. These pathways are sometimes referred to as the

'super highway' *en route* to the dorsolateral prefrontal cortex, where the most sophisticated problem solving takes place.

**Executive Function:** Executive function is assigned to the dorsolateral prefrontal cortex (outer top part of the frontal lobe). Regarded as the CEO of the brain, it is where the most sophisticated and enriched thinking takes place. The dorsolateral prefrontal cortex is interrelated with the ventromedial prefrontal cortex (inner bottom part of the frontal lobe). Important aspects of executive function include working memory, focus and sustained attention.

**Sensory Integration:** The brain always performs in the context of an external environment that continuously influences it. External cues are registered at the various primary sensory sites. From there the brain integrates the cues and attempts to make internal representations of what is out there and of what is possible. In this sense the external environment continuously affects innovation capability. In a special form of sensory integration known as priming, the amygdala and ventromedial pathways most likely play an important role.