

Improve Your Thinking

Rock D (2009) *Your Brain at Work* Harper Collins

Decision-making, problem-solving and creativity use the pre-frontal cortex (PFC). This is the part of the brain that differentiates us from the animals and is therefore known as the human brain. It developed later in evolutionary time and is located as the outer layer around the mammalian and the reptilian brains. The PFC can only process 1-3 things at a time.

Conscious thought (thinking) using the PFC employs 5 processes:

1. understanding
2. deciding
3. recalling
4. memorising
5. inhibiting (stopping unwanted thoughts)

Some mental processes take up more resources than others. One of the most resource intensive thinking processes is putting things in priority order.

Conscious thought consumes energy, which diminishes rapidly over time...the feeling of being "brain dead".

How to better manage your thinking resources

1. Time challenging thinking tasks such as prioritising to early in the day;
2. Prioritise activities according to the amount of challenging thinking (mental energy resources) required
3. Use visualisation to capture issues and concepts. Pictures take up less thinking resources than the equivalent information in words
4. List issues/problems/tasks for later processing, but then set them aside.

Complexity

New concepts and ideas take up more brain space than familiar ideas. The best decisions are made when there are only two choices.

- Simplify challenges by focussing on the salient elements
- Group information into chunks if there is too much. Deal with each chunk separately.

Doing two things at once reduces attention to each task and may cause reduced performance, mistakes and anxiety. If accuracy is important, do one thing at a time.

Multi-tasking is OK if one task is a habit or ingrained behaviour like driving a car or using the phone. Such habitual behaviour is stored in the basal ganglia away from the PFC so takes up much less mental resources. It helps to embed repetitive and routine tasks if they have to be done at the same time as thinking tasks.

Get thinking and decisions in the correct order to avoid decision-queueing. This happens when downstream decisions depend on those upstream.

Distractions

Our attention is easily distracted by both internal and external distractions. For example, being "always on" (via twitter, email, SMS, phone and internet) is very distracting, especially in meetings, reduces IQ and drains mental resources from thinking tasks. It's possible to inhibit mental distractions (by diverting thinking away from them), but this drains mental resources away from the PFC reducing the effectiveness of thinking.

When you need to focus on a thinking task, remove all distractions and clear your mind. Distractions can also be inhibited by physical activity. Distractions increase in intensity and momentum if they are left uninhibited. It's important to catch the impulse to be distracted early. The ease with which a person can be distracted is inverse to their ability to stay focussed. Ability in this area can be measured using the STROOP test.

Performance and Arousal

Peak performance requires the right amount of arousal or stress. The right level of arousal is called being "in the flow". In this state, just the right amount of new connections are being made in the brain. This happens with new experiences undertaken in a safe environment. The things and experiences that arouse us are peculiar to each of us, both in type and intensity.

Two hormones are involved in arousal: Noradrenaline and Dopamine.

Noradrenaline is the hormone of alertness to danger and a sense of urgency. It can be produced just by visualising scary events.

Dopamine is the hormone of interest in pleasant experiences, novelty, the unexpected, fun, and rewards (such as money, sex, food, positive social interactions).

When the two hormones are released they increase arousal. This increase focus and cause more new connections to be created, further increasing arousal. This state is what we call "being on a high". Too much arousal is more deleterious to our ability to think clearly than too little.

Techniques to manage arousal include:

- monitor your levels of interest and alertness during the day and note the triggers;
- write things down;
- Raise your noradrenaline level to achieve increased arousal by visualising a mild fear;
- Bring up Dopamine levels by using novelty, changed perspective, humour, expecting a positive event; or
- Reduce both Noradrenaline and Dopamine by activating other brain regions to take the focus away from the PFC. For example, listening to music or do a familiar physical task.

Getting Past a Mental Block or Impasse

An impasse happens when you are stuck on the same small set of solutions to the problem. Overcome such impasses by putting your mind into idle to reduce the activation of wrong answers. The process of having insights enables you to recognise subtle signals

and allowing loose connections. Insights are more frequent when you are relaxed and happy.

When stuck and unable to solve a problem, seek insight. Insights are revelations that come into the mind through subconscious processes, often when least expected, and when pleasure senses are activated, such as in the shower, while driving, at the gym.

Thinking hard about a particular problem inhibits other ideas and thoughts from being available. Stop thinking and the new ideas emerge.

Techniques for increasing insights include:

- reduce deadline pressure on yourself to reduce anxiety by having fun;
- simplify the problem into its salient elements and features. When insights arise, focus on them.
- take a break, especially to do something completely different and arousing or pleasurable, then return to thinking. The pleasure increases happiness, produces Dopamine and increases insights. Anxiety has the opposite effect;
- ask someone else to help - they take a different perspective;
- look at the big picture rather than the detail. This also increases insight; and
- increase control over your thinking processes (cognitive control by observing your own thinking; also known as metacognition) by accessing a quiet mind state (mindfulness).

Metacognition is the ability to think about how you are thinking. Observing your own thinking is self-awareness or mindfulness. It requires you to take a 3rd person perspective about yourself and your own thinking processes. It is a key skill in moderating and re-directing your behaviour. Real time goal-directed modulation of behaviour is the key to acting as a mature adult. Metacognition is needed to rise above habits and automatic responses and to direct attention towards goals and purpose. The alternative is to live life driven by automatic responses based on anger, sadness, fear, greed and habit.

The Thinking Process

ARIA is an acronym for the four steps in moving towards the solution of a problem using thinking. These four steps are the basis of the coaching process.

A is for Awareness: a light focus on the issue or problem. Summarise it into a few words or one sentence.

R is for Reflection: give yourself time to think. Consider your thinking process in relation to the issue. Take perspective or re-appraise the problem. Seek the semi-awake state similar to taking a warm shower

I is for Insight: options and ideas emerge from the subconscious. These "ah ha" moments release dopamine and noradrenaline giving a brief strong surge of energy.

A is for Action: harness the energy to act or commit to act. Courage and motivation spike up at this time.

Mindfulness

Mindfulness is paying close attention to the present in an open accepting way by having awareness of sensory experiences as they occurs in real time. Strong skills in mindfulness correlate with good physical and mental health and relationships.

When we are not thinking with the PFC and when we are not aroused via the limbic system, our mind state is using one of two states:

1. The default network. This is also known as the narrative network. Here we daydream and re-tell stories and scenarios of our past and future, especially in regard to relationships. This is low resource demanding thinking; and
2. The direct experience network. This network is activated when we experience direct body sensations such as touch (feel), smell, taste, sight and sound. Listening to music, having a shower, watching the sunset all activate this network.

These two networks work against one another. When one is activated, the other is suppressed. Being able to switch easily between these two networks in real time gives increased flexibility of responses to the world, reduced reliance on habits and embedded circuits, reduced reliance on assumptions and expectations, and increases responsiveness.

Sensory experiences include internal states, especially emotions. Its harder to switch states when you are under pressure or aroused.

The Limbic System

The brain is constantly scanning for threats and rewards. This is a process developed when we all lived in caves and had no language. Survival favoured those who were best at detecting threats and rewards and communicating these by expressing emotions. Detecting these threats and rewards brings an emotional response (fear, anger, sadness, joy, surprise, contempt and disgust) from the limbic system, along with the appropriate instant and automatic reaction outside consciousness. Being able to regulate these emotional reactions is a key to having an effective life.

The limbic system is part of the mammalian and reptilian brains and includes the amygdala. The limbic system tracks our emotional reactions to thoughts, objects, people and events. It is how we feel about the world from moment to moment.

Given choice and no time or energy to think everything through with logic, we choose based on value judgements formed by emotional reactions. Every decision of the limbic system is based on what we give attention to, and is directed to minimising danger and maximising rewards.

Towards and Away Reactions

When the limbic system is aroused, emotional reactions are either *towards* safety or *away* from danger.

Towards emotions help us to acquire things that help us to survive. These emotions are slower and harder to arouse and include curiosity, happiness, surprise.

Away emotional reactions help us to move away from threats and include fear, anger, sadness, contempt and disgust. These are faster to arouse and harder to suppress. *Away* reactions have more impact when our tolerance is lowered, such as when we are tired, ill, hungry, intoxicated, already aroused by another event or situation.

When the limbic system is aroused in this way the pre-frontal cortex (PFC) is inhibited, making thinking processes much more difficult by using up brain bandwidth and by

drawing brain resources away from the PFC. If the limbic system is over-aroused we may experience a false sense of confidence.

During over-arousal, the brain relies on the automatic and embedded functions stored in the basal ganglia. (This is why training for and practicing emergency responses is so important). Such overloading reduces metacognition. During over-arousal the brain also tends towards negative emotional responses to move away from the high risk of the threat.

At moments of the onset of high anxiety the brain may suffer an attention blank of up to 0.5 seconds, presenting the person from hearing what is happening.

Arousal of the *away* reaction over a long period of time produces elevated adrenaline and cortisol levels in the blood resulting in a semi-permanent state of threat and a lowered threat threshold.

How to Reduce Arousal

The most important and effective response is to act before the emotion arises. It is important to practice noticing the onset phase of an emotional arousal. There are 3 options:

1. situation selection: avoid people, events and places that you can anticipate will provoke your emotions;
2. situation modification: change the dynamics or arrangements to reduce stress. For example, don't sit opposite someone who you find challenging;
3. attention deployment: when an emotional reaction is anticipated turn your attention away from the provocation.

Emotions are harder to manage once they are full-blown. Use mindfulness to observe your emotional state as it escalates. Options for managing aroused emotions include:

1. express the emotion. This may either reduce or amplify the emotion, but may not be socially acceptable;
2. suppress the emotion by trying to hold it in. This is very mentally resource intensive and exhausting, and may make the arousal more intense and longer lasting. This approach makes others feel uncomfortable, and can cause illness, especially increased blood pressure, reduced memory of the events, and loss of focus.
3. cognitive change: this involves thinking differently about the situation. Options include:
 - Labelling: name and call out the emotion using one word or a metaphor to describe it. (It's helpful to develop a vocabulary for describing various intensities for the *away* emotions of fear, anger and sadness);
 - Re-appraisal: reinterpret the event using another person's perspective or re-framing; or
 - Mindfulness: this reduces the arousal.

Re-appraisal

Re-appraisal is very effective in regulating emotions but it is mental resource intensive. It is best done when well-rested, or with someone else such as your coach, a trusted friend, your mentor or spouse. Re-appraisal gets easier with practice. Optimists are good at re-appraisal.

Four techniques are available for re-appraisal of challenging events or situations:

1. re-interpret the event by seeing it in a wider context, such as "things could be worse";
2. normalise the event: consider it as typical for the situation that you are in: "anyone in your situation would feel the same";
3. re-order the elements of the problem: this involves changing the priorities of the elements of the problem in regard to what you can settle for and what you must have. In this way, different elements move up and down in importance, changing their impact on the decision-making;
4. perspective taking: consider what another person in this situation might think and choose. Look at it from differences of age, gender, culture, time.

A SCARF for Social Connection

The five domains of social connection are *status*, *certainty*, *autonomy*, *relatedness*, and *fairness*. These are all seen as primary needs for psychological well-being. When any of these is enhanced, we experience a release of dopamine and a strong *towards* reaction, but if any of them is eroded, a strong *away* reaction based on anger, fear, or sadness will result. If an *away* reaction is prolonged or frequent, psychological harm may result due to the release of cortisol and adrenalin. Therefore seek to strengthen these in yourself and for others.

Status

Status is also a primary psychological need. Loss of status is a very strong threat and results in a sharp *away* reaction with anger, fear or sadness being aroused.

Status is anything that gives a sense of being "better than", or belonging. It is our sense of where we fit into the pecking order. It is a sense of relative importance as defined by a huge range of sometimes contradictory variables including height, weight, beauty, face, intelligence, income, employment, busyness, idleness, righteousness, political leaning, organising skill, age, joke telling ability, ethnicity, gender, skill level, competence, attractiveness, power, being "in the know", being correct. Exclusion from a group based on perceived differences in status is a strong and powerful threat. It's the basis of most bullying in schools and the workplace.

People will act to protect or increase their status, including avoiding novel experiences in which they may be shown to be less adequate.

Issues of status are more important when our concern is for what other people think about us. A strong sense of self-worth based on internalised values is the best protection against a status threat. It follows that people with a less well-developed sense of self-worth will be more prone to status challenges. Vulnerability to status challenges is a feature of the self-sovereign and social levels of adult maturity as described by Kegan. Kegan's self-authored adults are by definition less susceptible to status challenges.

Avoiding arousal from perceived reduction of status requires a rapid intervention using re-appraisal. Labelling the *away* or negative emotion will almost always be inadequate to manage arousal induced by a challenge to status.

Being wrong is a strong threat because of loss of status. People will go to extraordinary lengths to avoid being shown to be wrong. It is therefore very hard to admit that you are wrong without feeling a loss of status. Further, when you think you are right, and another person tries to put an opposing point of view, you perceive that person and being wrong, and therefore of lower status, and you will stop listening to them. This comes across as arrogance.

Status threats have a very low threshold. Once aroused, the limbic system makes accidental connections, causing us to see things and meanings that are not intended.

If we experience or perceive an increase in status we enjoy a strong *towards* reaction of dopamine, and clarity of thinking, because of a boost to the PFC.

Your sense of status can be improved by playing against yourself. In this approach, you seek to better your previous performance, and derive increased status within your own perception of yourself as a result. If others are aware of your results they may find it threatening due to their perceived reduced status, so avoid boasting unless you want to increase your status at other people's expense.

Status is the most reactive of all five SCARF elements, especially in organisations. It is also the basis for sibling rivalry.

Status threats can be managed as follows:

- lower your own status by sharing humanity;
- using self-deprecating humour;
- admit mistakes;
- give others positive feedback and genuine praise;
- Don't boast or make your status unnecessarily obvious; and
- Use metacognition to monitor status threats, especially from your own behaviour.

Certainty and Expectation

The brain craves certainty from the prediction of outcomes based on the memory of past events and experiences. Correct predictions are rewarding giving reinforcement to the prediction's validity. We often seek and only accept data and information that confirms our predictions. A correct prediction results in a *towards* reaction. (This is the basis of gambling addiction). Conversely, incorrect predictions are seen as a threat and result in an *away* reaction. We will act to ensure that we don't make wrong predictions. This can result in risk aversion. Uncertainty is therefore seen as a threat.

Certainty is knowing what to expect. Expectation of a reward or a desired outcome causes arousal of the limbic system. This arousal also causes an increase in pre-frontal cortex (PFC) function. The process of goal setting establishes expectations of reward from what is valued. This leads your brain to orientate towards events, people, resources, information and opportunities that connect to the goal. You begin to notice things that will help you to achieve your goal.

We see what we expect to see and miss the unexpected. Unmet expectations are a threat and cause an *away* response in the limbic system. We therefore interpret data and events

to have our expectations met, with any tenuous links or data that don't fit the expectation being ignored. This is confirmation bias.

Unexpected rewards release a burst of dopamine creating a *toward* response. Conversely, not receiving an expected reward causes a big drop on dopamine resulting in an even stronger *away* reaction.

People perform better when they are happy. Managing expectations so that they are mostly met or exceeded will result in more dopamine release and increased PFC function. The happiness hormone dopamine can be triggered by novelty, unexpected rewards, belief that things will get better. The opposite happens with unmet expectations, especially in relation to fairness, status, certainty, autonomy, or relatedness. Minimisation of expectations is a key to managing outcomes in times of uncertainty.

Monitor your own expectations to observe how they affect your mind state.

Autonomy and Control

Autonomy is the ability to make your own decisions about your life and work. A decrease in your control over your life or work results in a reduction in autonomy producing a limbic reaction, especially based on fear. This causes anxiety and an *away* reaction.

Loss of autonomy tends not to have as strong a psychological impact as loss of status or perceived unfairness.

Relatedness

Social connections or relatedness is a primary need as important as food and water. Connection comes from experiencing other people's states of mind ourselves. Safe connections are vital for healthy collaboration. We initially class other people as friends or foes, with foe being the default in the absence of positive cues, or safety being confirmed. Making connections takes work to overcome the perception of the person being a foe. Safety is the first consideration in assessing any new social connection.

Skills for increasing safety in a social connection include:

- when first meeting people, connect at a human level by sharing something of yourself and looking for common ground (especially through children, family, passions). This will greatly reduce the perceived threat; and
- Encourage connection at the human level, especially through collaboration.

Fairness

Fairness is another primary need of the brain. Perceptions of decreased fairness are seen as a threat producing an *away* response from the limbic system, evoking the emotions of anger, fear or sadness. Perceived injustices have more impact when our tolerance is lowered, such as when we are tired, ill, hungry, intoxicated, already aroused by another event or situation.

Labelling the emotion being aroused may not be sufficient to arrest the arousal, because fairness is such a sensitive issue. If labelling doesn't work, use re-appraisal. This needs to be done fast, before arousal gets too high.

When we experience or perceive increased fairness, or when unfairness is punished, we experience a dopamine release and a *towards* feeling. If you perceive that someone is treating you fairly this will increase the connection and relatedness with that person. The sense of "doing the right thing by everyone" is especially important in the workplace.

Volunteering links to increased fairness because we equate it with helping to overcome or rectify an injustice. For example, helping other people who have been harmed by flooding or bushfire.

There is a dynamic between expectation and fairness. If you expect to be treated fairly and you are not, this is a double negative. It's particularly profound when a trusted friend (or partner) acts unfairly towards you. The feeling is of betrayal.

There is perhaps less of an impact if you start with the reduced expectation of being treated fairly, especially with your manager in the workplace.

Accepting and dealing with unfairness is a key skill for the workplace. Helping to rectify unfairness is rewarding and results in a *towards* reaction and increased PFC activity. If unfairness is left unpunished this will result in an *away* reaction and limbic arousal.

Changing Others

The standard approach by managers is to seek to produce change in others is by giving negative or "constructive" feedback about their performance. The trouble with negative feedback is that it results in a reduction in the recipient's status and is therefore a threat, resulting in an *away* reaction.

Offering suggestions, guidance and advice are likewise received as threatening because of the perceived reduction in status and decision-making autonomy inherent in them.

Similarly, analysing a problem by drilling down to the granular level gives focus to the problem (and the associated drama), triggering the remembered negative emotions. It almost always leads to mental exhaustion because it is so resource hungry, and to unfulfillable dead-end generalisations. Reduce the description of the problem to a few words or a memorable sentence then move to linking it to a solution.

A focus on solutions and desired outcomes is more creative and provokes *towards* reactions and increased insights. Perspective-taking about the solution helps to identify or elicit loose connections and for insights to emerge.

Stop and think "what might solve this?". Allow yourself to have quiet hunches about the solution. Ask questions about the solution to create new connections. It's necessary to re-visit the solution frequently to keep the new mental circuits alive and for them to become embedded.

When seeking to change others, the first issue to address is safety. This involves putting them at their ease first. This is the purpose of rapport building. It is very difficult to influence others to change if they are aroused by an *away* state of mind induced by fear, anger or sadness. Their reaction will be to move away from the threat rather than engaging in the change process.

To facilitate positive change in others, seek to enhance any or all of their SCARF elements.

Status: encourage, especially in regard to capability;

Certainty: make implicit issues explicit, clarify expectations that are achievable, clarify objectives, give unexpected rewards;

Autonomy: use questioning and listening skills to elicit ideas, encourage learning by mistakes, give ownership;

Relatedness: develop human connections in the workplace, encourage a sense of belonging to the team;

Fairness: make policy and procedures clear, be consistent, reward excellence and address poor performance, share the rough and the smooth.

The central concept of change is to give attention to the solution. This needs practice, and mindfulness will help. Because of our prehistoric focus on survival, attention easily and quickly drifts to threats. These can take over and swamp the solution focus if allowed to take hold.