



Neuro-Agility Profile® Training Manual

A practical guide to understanding the NAP™ Brain Profile



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Welcome to the Neuro Agility Profile® (NAP™) Training Program

Congratulations on your decision to participate in Neuro-Link's Neuro Agility Profile™ Practitioner Training Self-Study Program. Adding this training to your toolbox of skills will add tremendous value to people's lives! We are a dedicated group of professionals sharing the passion for developing people.



The World Economic Forum rates 5 of the top 10 most desired skills for people to prosper in the job market of the future as brain power skills. These skills are complex problem solving, critical thinking, creativity, decision making and cognitive flexibility. If people or organizations want to be competitive, they need to out-think, out-learn, out-create and out-perform their competition! We are born with thinking, learning and creative potential. It will however, require learning the appropriate thinking, learning and creative skills to be able to out-think, out-learn, out-create and out-perform the competition. Optimizing brain fitness and neurological flexibility will be a vital pre-requisite to help people learn, think and create with ease, speed and flexibility. This places developing brain power and neuro-agility in the center of people development. All people think, learn and create, but in different ways. To develop these brain power and neuro-agility skills for the future, we need to assist people with a framework for optimizing the drivers that impact their brain performance and identifying the neurophysiological components that influence the ease, speed and flexibility with which they learn, think and process information.

Neuro-Link's NAP™ Practitioner Training Program will provide you with a comprehensive, holistic, and cutting edge framework to identify people's unique talent, create personal brain-based development plans, reduce risk for human error and improve their performance, brain health and happiness.

At Neuro-Link we believe: "you can't improve what you can't measure". Over more than 25 years Neuro-Link has developed a comprehensive assessment, unique in its kind, registered as the Neuro-Agility Profile (NAP™).

The NAP™ brain profile assessment is a multi-dimensional, neuroscience innovation that assesses 6 drivers that can be enhanced for optimum brain performance and 7 neurophysiological components that impact a person's neurological design. It is generally referred to as a brain profile assessment, but is not similar to any other assessments in the market, also referred to as brain profiles, as it is the most comprehensive neuro-agility assessment that exist.

The NAP™ Practitioner Self-Study Program certifies lecturers, teachers, facilitators, coaches, therapists, talent development practitioners and performance improvement professionals to assess others and debrief them on their unique neurological design (potential) and the drivers that optimize their brain performance and brain health.



Neuro-Agility is a theme that will be constantly referred to and reinforced throughout this Training Program.

OUTCOMES OF THE PRACTITIONER TRAINING

After completion of this program, you will be able to:

1. Identify neurological & learning hindrances.
2. Reduce risk of human error.
3. Accurately assess people's neurological design & learning potential.
4. Measure and enhance brain performance.
5. Optimize and improve brain health.
6. Debrief individuals on their neuro-design and the drivers that optimize their performance.
7. Debrief teams on what the team profile and character looks like and the unique contribution each team member can make in the team.
8. Help people align who they are with their job functions and career choices.
9. Accelerate people's learning results.
10. Use Neuro-Link's assessments as a revenue stream to generate income.

Disclaimer:

The information provided in this report is based solely on data developed from Neuro-Link's Neuro Agility Profile™. It should be interpreted in light of other information that is also available about the individual and should never be used as the sole basis upon which to make development, or promotional decisions. To make an informed decision about how to develop this individual's talent, or improve performance, or reduce his/her risk for error, this report should be used in conjunction with other knowledge about the candidate, particularly information from other instruments, or the individual's interview, résumé, as well as feedback from references.

The techniques, activities and suggestions mentioned in this profile are solely for educational, training and/or self-development purposes. The author, does not directly or indirectly present any part of this profile as a diagnosis or as a prescription for any ailment for any person. People using the information, techniques and activities reported here in, do so for educational, training or self-development purposes only. Should you have a specific medical condition, you have to consult with your doctor and follow their instructions.

Module 1 – Your Amazing Neuro Agility Profile® (NAP™)

The Neuro Agility Profile™ Advanced+, abbreviated as the NAP™ Advanced+ is a brain profile assessment for adults, manager, leaders and teams. It provides feedback on 13 components of neuro-agility that determine the ease, speed and flexibility with which people learn and think. The Advanced+ illustrates 7 neurophysiological components of their neurological design and 6 drivers that optimize their brain performance. This brain profile assessment is a practical instrument to discover how uniquely people process information, which natural strengths and preferences they have when learning or thinking and also indicates areas for future development.

You can't improve what you can't measure. The Neuro Agility Profile™ Advanced+ is a must for any person who wants to accurately understand their unique neurological design and optimize the drivers that optimize their brain performance and brain health. This assessment will also improve your self-awareness and provide valuable information to help you formulate your life purpose, increase self-confidence, manage yourself more effectively, understand yourself, understand others, reduce your risk for error and communicate more effectively.

Congratulations! You are investing in the greatest asset you will ever have – Your brain!

The first step towards becoming a NAP™ Brain Profile Practitioner is to understand your own neurological design and also to experience the brain profile for yourself. Completing the NAP™ Advanced+ takes about 45-60 minutes. After completing the NAP™ Advanced+ assessment watch your NAP™ Advanced+ brain profile debriefing videos – 120 minutes.

Go ahead to the following link www.neuro-link.net and take the assessment if you have not done a NAP™ Advanced+ brain profile assessment yet. Your brain profile report will be emailed to you once it has been completed. When you have completed your assessment, please go ahead to the following link www.neuro-link.com/company/cms/my-account/ in order to start with the online course and mark this lesson as complete and then watch the debriefing videos in the next lesson.

Note: Your username and password will be the same for both websites.

Module 2: Introduction

Neuro agility is about the readiness of all the senses and brain regions to function as one integrated whole brain system, being receptive and responsive to receive and transmit bio-chemical impulses at optimum capacity under new and potentially stressful conditions.

People who are highly neuro agile have the flexibility to learn new skills, attitudes and behaviours fast and easy and unlearn old, unwanted behaviour patterns quickly.

“You can’t improve which you have not yet measured”

The Neuro Agility Profile™ measures a person’s flexibility to learn new skills, attitudes and behaviours fast and easy and apply experiences in new situations quickly.

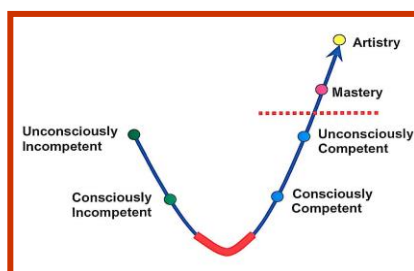
The purpose of the NAP™ is to measure the drivers that optimize brain performance and its impact on 7 neurophysiological attributes of thinking, learning and personality. These factors indicate a person’s neuro-agility, which will have a direct, measurable impact on business performance.

The **purpose** of the NAP™ assessment is:

1. To determine a person’s neuro-agility
2. Select talent
3. Align neuro-design with job, subject & career choices
4. Accurately identify learning potential & talent
5. Optimize brain performance, learning ability & learning agility
6. Improve brain health & wellness
7. Develop talent
8. Reduce risk for human error
9. Increase engagement & happiness

Things to keep in mind when completing the **course work**:

- It is highly recommended that you print your brain profile and keep it handy to refer back to when appropriate;
- Keep all printed manuals and profiles in one file;
- Watch all videos sequentially, while following the appropriate content in the manual;
- Complete all Multiple Choice Questionnaires at end of each module and scoring a minimum of 80% is required to progress to the next module;
- Work through the White Paper, Neuro-Agility and Marketing manuals.



Module 3: Future Skills

Big changes are coming. The world is entering an era of disruptive change. In a report: The Future of Jobs, the World Economic Forum (WEF) predicts an enormous change in the most desirable skills to thrive in the job market of the future. The table below illustrates the top 10 most desired skills for the workplace of the future in order of priority:

- Complex problem solving
- Critical thinking
- Creativity
- People management
- Co-ordinating with others
- Emotional Intelligence
- Judgement and decision making
- Service orientation
- Negotiation
- Cognitive flexibility

Five of the top ten skills can be categorized as “brain power” skills and five falls into the framework of emotional intelligence (EI) skills. With regards to brain power skills, complex problem-solving skills occupies the top slot, critical thinking skills and creativity takes the second and third position, judgement and decision making in seventh position and cognitive flexibility coming in at number ten.

The challenge of disruptive change: Future skills

Lack of skills to cope with information overload

Rapidly changing technologies coupled with data explosion and the generally heightened pace of change will cause disruption on every level of society and in every industry. Information is now more than doubling every year. Today the brain of the average worker must process 30 times more information than 20 years ago. A single weekly edition of the New York Times contains more information than a person would have been exposed to in a lifetime during the 17th century! On the downside of this amazing expansion of available information, is the real threat of being overwhelmed by the sheer volume. An estimated 75 to 90 percent of all illnesses have its origin in chronic stress. Information overload is quickly becoming one of the greatest sources of stress. People are constantly feeling overwhelmed by too much data, often thinking they don't have sufficient brain power skills to process information effectively and cope with processing volumes of information.

Not only are people reading less and slower, they only retain full concentration for 20 minutes at a time. People forget up to 90% of what they learn within one week. The reality is that people are relying on devices like calculators to do their calculations, GPS devices to take them where they want to go and devices to help them remember, but are not relying on their brain's natural ability to think, learn, remember and calculate for itself, that is actually their competitive advantage.

The argument is not that people should not use devices and technology, as they are powerful tools to accelerate what we do. We should however, not stop using and optimizing the brain's ability to flex mental muscle if we want to stay in control of technology and artificial intelligence. What distinguishes man's competitive advantage from artificial intelligence is specifically the fact that our brain has the potential to naturally perform cognitive processes like making predictions and forecasts about future situations, creating new solutions, performing counterfactual thinking (the ability to imagine what can be and identify alternative outcomes), recognizing patterns, experiment and reflect, learn, create and solve problems in sophisticated ways like nothing else in the universe. Having the potential to out-think, out-learn and out-create is unfortunately not enough. Potential plus nothing equals nothing. Potential plus appropriate skills equals competence. Therefore, developing the brain power and emotional intelligence (EI) skills as the WEF suggest, will be essential to our progress and survival.

On average readers read around 200 words per minute with a comprehension of 60%. It is even less in developing countries. While the world is exploding with information, the contradiction is that only one in 10 books that are bought, are read. In a time where we now need to read faster than ever before, we are reading less and slower. Most adults and children don't read any more. Often, managers are complaining about staff that are not reading their emails. Reading and learning problems are at an all-time high. Learning service providers must adapt their courses to video learning solutions as people and especially younger generations now prefer learning through videos rather than script.

To cope with the current reality of information expansion, readers should be reading at speeds above a 1000 words per minute with 85% comprehension. These readers only comprise 1 % of the first world population. To do this, requires the whole brain to function at optimum level, being ready to receive and transmit sensory stimuli and open and responsive to ideas, impressions, and concepts, all at the same time. It will also require advanced visual processing skills, the ability to reduce masses of information to meaningful data, concentration skills and memory skills. Lack of these learning skills, will make people less attractive as job applicants and may prevent billions of people to be employable and competitive, losing their jobs to robots and artificial intelligence.

People are not born with skills. They develop it. Fact is that few learning institutions like schools, colleges and universities provide the necessary skills that will ensure their learners are sufficiently equipped with relevant "brain power" and "EI" skills to not only survive, but to thrive in the job market of the future.

Technological advancements

Big technological changes are on our doorstep. The interplay between fields like artificial intelligence, virtual reality, the internet of things, 3D printing, neuroscience, mobile networks, and computing will create realities that were previously unthinkable. Radical system-wide innovations can happen in short periods of time. Machines can learn, which puts artificial intelligence in direct competition with people, especially those who are doing routine and repetitive

jobs. It will cause widespread disruption to business models and labour markets over coming years.

People who do not have advanced cognitive skill sets as suggested in the WEF's top 10 most desired skills for the workplace, and specialized technical skills, doing basic repetitive or computer work, will be replaced by robots that will take over their jobs. This will cause people who don't have sophisticated skills like the brain power skills mentioned above, and the neuro-agility required to execute those skills well, to lose their jobs. Some sources predict as many as 60-70% of people stand to lose their jobs within the next 10 years.

Human error



One of the greatest risks to the success of businesses is human error. Human errors can be the root cause of both catastrophic organizational accidents and serious individual injuries. Incident reports in some industries show that as much as 80% - 90% of serious injuries and accidents have been attributed to human error. The overall cost of human error to US and UK businesses is \$ 18.7 billion per year. To reduce human error, businesses are spending billions on artificial intelligence and technology that can help them reduce the risk for injuries and accidents, saving lives and improving productivity and profits, but often replacing people and taking their jobs.

The fact of the matter is that if the world of business wants to reduce their risk for human errors, they should primarily focus on first helping employees reduce their risk for error before considering technology as the primary solution. Unfortunately, little is done in general to help employees reduce their risk for error, suggesting we are not all that clear about how to help employees reduce their risk for errors.

Workplace engagement

Employee engagement is a workplace approach resulting in creating and maintaining the right conditions for all members of an organization to perform at their best each day. Engaged workers are great assets to their companies as they are committed to their organization's vision and mission, motivated to contribute to organizational success, with an enhanced sense of well-being. Employee engagement is vital for a company's productivity, success, and progress. Disengagement equates for 51% of the US workforce. Actively disengaged employees are costing the US \$450-550 billion in lost productivity. Organizations with engaged employees out-perform those with low employee engagement by 202%.

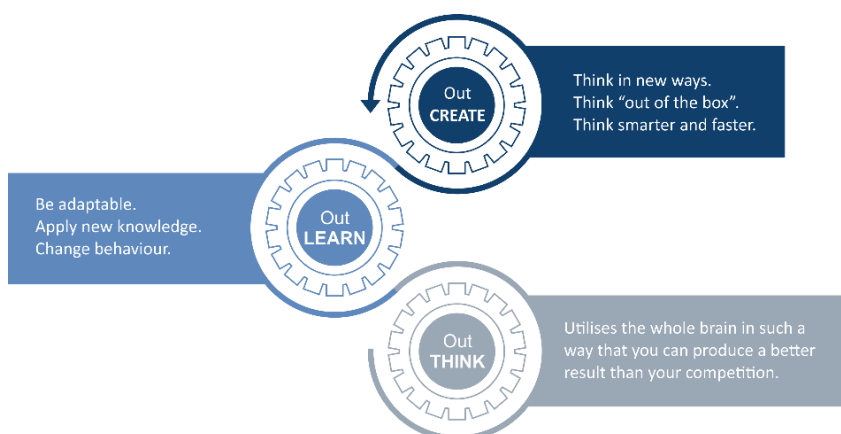
One of the primary reasons why people are disengaged in their jobs is the lack of alignment between who they are (their neurological design) and what they do (career and job functions). It explains why they are passionate about their jobs, enjoy their work, are energized, engaged, happy and in flow, or not. People's neurological design also has numerous implications for how agile they are to adjust to new change, talent development, maintaining constructive relationships, the roles they play in teams, stress and fatigue management, whole brain communication, emotional intelligence, and how they learn and think.

Because of disruptive change as described above, jobs are becoming more complex and global and as a result, individuals moving into these roles need to be flexible, adaptable, and able to learn from experience fast and easy, applying that learning in new and stressful situations quickly. The selection of high potential talent should therefore primarily account for people's agility to learn and adapt to the demands of new roles fast and easy and not simply their performance in a prior roles as was the case previously.

Learning & Neuroscience

Learning

The only way that people and business will maintain a competitive advantage in this rapidly changing, information soaked, and turbulent world, is to be able to out-think, out-learn and out-create any competition. Learning is the DNA of the mind. By gaining deep insight into how the brain functions in support of learning, critical thinking, creativity, and problem-solving, neuroplasticity and decision making, we can better prepare people to adapt to, and prepare for a continually changing market place, thus allowing companies to maintain a competitive advantage in highly turbulent business environments.



Brain power is our competitive advantage. Ultimately the brain's main purpose is to let people survive. On a physical level, it is about regulating bodily functions. On a mental level, it is about a person's ability to adapt, survive and thrive in a continuously changing world. Man's learning ability to adapt, adjust, learn new information with ease and speed, and unlearn old behavior faster than their competition, will be crucial to his survival and progress in an era of disruptive change.

To stay competitive in today's business world requires a fierce ability to learn, to improve, and to adapt. 'The ability to learn is a meta-concept reflecting a constellation of individual characteristics and attributes that enable people to develop or refine their job related knowledge and skills in response to changing job demands and in service of improving their performance.

Former strategist and executive of Shell Oil Company, Arie de Geus said:

“A company’s ability to learn faster than its competitors, may be its only sustainable competitive advantage in the future”.

The collective mental flexibility of an organisation’s people to continuously adapt and adjust to new systems, strategies, structures and technology, fast and easy, certainly is their greatest competitive advantage. Learning therefore, is not only the DNA of the mind but also the DNA of any progressive and competitive organization.

A learning organization is an organization that nurtures and improves a culture of learning and innovation, one in which employees continuously seek, share, and apply new knowledge and skills to improve individual and organizational performance and drive business results.

Progressive companies realize that if they want to prosper, they must become and stay learning organizations who build learning into their organization’s strategy, provide learning as a core competency, and remain committed to establishing and maintaining a culture of learning. Future learning organizations will be enterprises whose workforce has the learning agility to continuously adapt and adjust in diverse and continuously changing circumstances faster than their competitors. Their workers’ ability to learn will comprise of a diverse set of attributes and competencies that include, but is not limited to attributes such as neuro-agility, openness to experiences, motivation to learn, recognition of new opportunities, recognition of new skills needed when change occurs, and resilience in the face of adversity.



Successful global companies like Toyota know that their workforces’ ability to learn is requisite to survival and progress in a highly competitive market. Toyota understands that its workforces’ ability to learn consist of a constellation of learning skills that enable them to develop and refine job related knowledge and skills in response to changing job demands, continuously improving their performance

and adapting to change. Subsequently, they have adopted a philosophy called “Kaizen” (which means ongoing learning and improvement) to invest in reskilling, up skilling and multiskilling by continuously rotating the jobs people do, to change behaviour conducive to out-performing their competition.

Because of the continuous changes occurring in today’s organizations and markets, adaptability, agility, and flexibility have become increasingly important to safeguarding organisations’ and people’s future progress and improving their performance. Organizations are only as agile as the people who work there, the people who make the company what it is. The term “agility” refers to “the power of moving quickly and easily” and “the ability to think and draw conclusions quickly”. People’s agility to adapt, adjust, learn new information fast and easy, unlearn old behaviour quickly, and be flexible in moving across ideas and

understandings in such a way that they are able to maximize the potential learning value of a given experience, will be crucial to their survival, progress and competitiveness.

As organizations become more complex and dynamic, peoples' ability to learn from experience becomes more important. The ability to learn from experience reflects a person's ability to master the changing demands of his or her job. It is referred to as learning agility and the concept has attracted considerable attention from human resource professionals and talent development consultants interested in selecting and developing employees' ability to learn from experience.

The traditional concept of learning agility however, has not taken into consideration factors like the drivers that improve people's brain performance or the neurophysiological components of a person's neurological design and the interplay between these factors. This has fuelled great interest into the concept of neuro-agility, as it is the core competence responsible for the ease, speed and neurological flexibility with which people learn and think.

Leading companies are already using a person's learning agility – the ability to learn from experience and apply that learning in new and stressful circumstances, in order to improve future performance – as one of their primary criteria in talent selection to employ high potential talent. The speed with which people learn and the flexibility they exhibit in learning both within and across situations has become a major criteria to identify future high-potential talent.

Neuroscience



NEUROSCIENCE

Neuroscience, also referred to as neurobiology, is a multidisciplinary branch of biology that deals with the structure, development, function, chemistry, pharmacology, learning implications, and pathology of neurons, neural circuits of

the brain and nervous system and various brain regions. It is not only concerned with the normal functioning of the brain for medical and healing purposes (the pathology perspective), but also with people's behavioural and developmental purposes and the learning and thinking implications of the brain (the development perspective).

Neuroscience focus on the brain and its impact on behaviour and cognitive functions across all disciplines. As an interdisciplinary science, it is one of the major accelerating forces of change across industries like medicine, business, psychology, philosophy, linguistics, chemistry, economics, education, engineering, talent development and performance improvement.

The brain power skills suggested by the WEF as the most desired skills for the workplace of the future clearly illustrates the importance and value of neuroscience. All people think, learn, are creative and solve problems, but in different ways, based on their unique neurological design. If skills like complex problem solving, critical thinking and creativity is not anchored and aligned with the neurophysiological components that impact the speed, ease and flexibility with which they think and learn and they are not equipped with the core neuro-agility competencies requisite to excel at these skills, they will not be able to be competitive and thrive.

Neuroscience of Learning

Cognitive neuroscience is a major branch of modern neuroscience – the study of higher cognitive functions that exist in humans, and their underlying neural bases. It draws from neuroscience, cognitive science, psychology, education and the science of learning.

Recent advances in neuroscience research has significantly enhanced our understanding of brain processes, and the functions of its underlying neural systems (how the brain stores and processes information, how neural plasticity impacts learning and observable behaviour, etc.).

This has led to stronger understanding of biological processes involved in learning, the relationship between brain hemispheres and sensory dominance, the impact on cognitive control, the meta-concept of learning ability, personal motivation, and social and emotional learning.

Until now, the science of learning principally was rooted in education and psychology. While these areas of research have greatly advanced our understanding of how knowledge is transferred, new skills are developed, and behaviour is changed to adapt in dynamic environments, the methods employed in behavioural sciences such as these have relied extensively on hypothetical constructs and have been able to measure relevant variables only indirectly.

Scientific research focusing specifically on the brain, such as physiology, neuro-physiology, chemistry, psychoneuroimmunology, and anatomy, provide methodology that support more direct observations of relevant variables, which serves to validate findings from the behavioural sciences.

This reciprocal and synergistic relationship between the sciences provides the promise of making tremendous gains in our understanding of how humans learn and will continue to provide direction in leveraging the reciprocal relationship between brain and environment as it helps to separate facts from fiction.

The neuroscience of learning is a branch of cognitive neuroscience. It is concerned with anchoring the science of learning into neuroscience. It provides sufficient evidence that can be put into practice to validate learning as one of the essential ingredients, if not the most sustainable ingredient for improving the performance of the workforce, improving productivity, impacting company bottom line and ensuring survival and progress of a company.

This places the neuroscience of learning in the centre of any talent management and performance improvement initiative where identifying potential, selecting talent, or modifying, optimizing and developing people's ability to learn, and reducing risk for error is a focal point.

The neuroscience of learning is revealing new insights about the neurophysiological mechanisms and components that influence talent and personality, offering new ways to approach talent selection, talent development, performance improvement coaching and the reduction of human errors. For example, we are learning that factors like fatigue and stress negatively impact people's unique information processing style, causing neurological hindrances that may significantly impact an individual's propensity for human error.

Why neuroscience of learning matters

- It validates learning and the behavioural sciences as it is grounded in hard sciences such as physiology, chemistry etc.
- It is inclusive of all cultures, races, genders, and generations and therefore requisite to any global people development and performance improvement initiative as a brain have no culture, race, gender or religion;
- It complements behavioural sciences and integrates easily with different learning technologies;
- It offers fresh perspectives on the meta-concept of "ability to learn" and learning agility;
- It offers a higher return on investment in talent development and performance improvement initiatives when grounded into the hard sciences;
- It separates facts from fiction, thereby solidifying learning practices.

Fundamental Principles of the Neuroscience of Learning

There are certain fundamental premises of the neuroscience of learning that are essential for learning professionals and practitioners to understand its applications to organizational learning. Any person responsible to prepare children, students, and workers for developing the skills necessary to prosper in the new landscape predicted for the future, will be well-served to have a clearer understanding of issues such as:

- The bio-chemistry of learning and thinking;
- How the brain works and processes information;
- Mechanisms that influence brain functions and learning;
- Learning implications of different brain regions;
- The concept of brain fitness and how to nurture and improve it;
- How to prepare and activate the brain for learning, thinking and creativity;
- How to identify and improve drivers that optimize brain performance;
- Advanced visual skills for workers who processes volumes of information;
- How to develop complex problem solving, critical thinking, creativity, emotional intelligence, and memory skills for 21st century workers;
- How neuroplasticity and learning agility is at the core of developing learning ability and behaviour change;
- The concept of neurological dominance, it's relationship between brain hemisphere and sensory dominance and its impact on performance and safety;
- How to determine people's unique neurological design (neuro-design) and learning potential;
- How people's neuro-design impact their propensity for error, sense of purpose, engagement, and performance;
- How to develop neuro-agility as a core competence requisite to learning ability and learning agility;
- Aligning workplace practices with memory and attention spans;
- Aligning working and learning environments with brain ergonomics principles.
- How to accommodate social and emotional learning preferences in the workplace;
- Grounding talent development and performance improvement practices into neuroscience;

Incorporating these fundamental principles and applying this evidence-based knowledge into their practices of human capital development, would be highly beneficial for people development and performance improvement practitioners, lecturers and teachers, as studies prove it produces better performance results, return on investment, sustainable behaviour change, wellness, productivity, and safety.

Neuroscience of Talent Development

The short shelf life of skills and a tightening labour market are giving rise to a multitude of skill gaps. Businesses are fighting to stay ahead of the curve, trying to

hold onto their best talent and struggling to fill key positions. People and organizations are consciously developing skills to stay relevant in the age of automation.

"As the rate of skills change accelerates across both old and new roles in all industries, proactive and innovative skill-building and talent management is an urgent issue. What this requires is a talent development function that is rapidly becoming more strategic and has a seat at the table."

— World Economic Forum

"The ability of the talent development function to positively affect company culture and help plan and execute change make it a dynamic player in driving organizational agility, innovation, and growth"

— Tony Bingham, CEO of ATD

Talent development therefore, should be top of mind for all organizations, as it is responsible to on board, enable, develop, and activate the key differentiator of any organization—its people. As a point of departure, talent developers should build a talent strategy and the infrastructure of employee journeys and experiences. They hone employee talent and create learning content to empower employees to continue to grow.

Talent is the natural ability that people are born with to excel at doing something that is hard or challenging. It is about the natural abilities that stand out in people and make them unique. All people are gifted, but in different ways. Some have more talent than others, but everybody has talent.

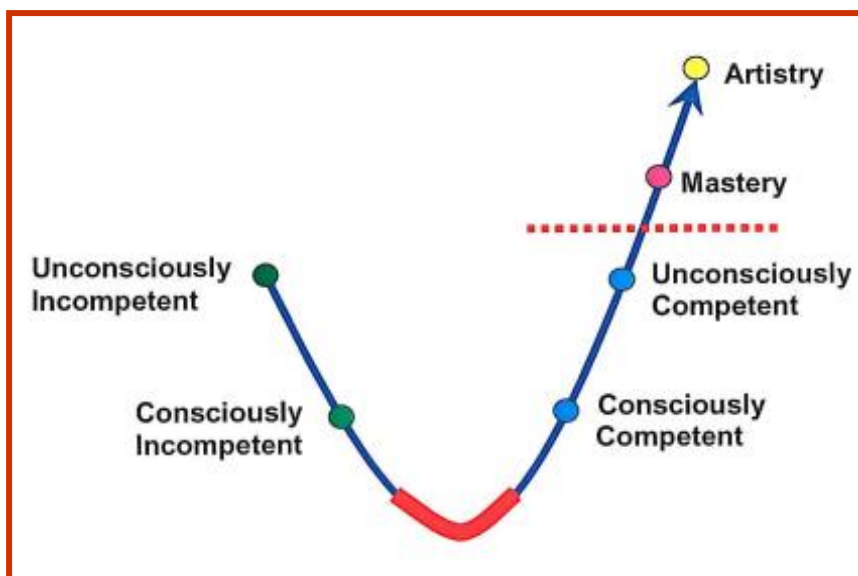
The neuroscience of talent development is a crucial component of the neuroscience of learning. People learn in different ways and are talented differently, based on their neurological design. Neuroscience research has significantly enhanced our understanding of brain processes and mechanisms that impact neurophysiological aspects of personality and how people are talented.

People's neurological design is about how their naturally strengthened neural networks influence their predisposition towards which brain regions, senses and intelligences will dominate (lead) during learning, thinking and cognitive processes. These strengthened neural networks will cause people to be consistent in their brain, sensory and intelligence preferences, establishing a specific blueprint for how they would prefer to think, learn and process information differently.

At Neuro-Link we believe that talent is the sum total of nature and nurture, or differently stated, neurological design (potential) plus alignment and reinforcement of appropriate skills. Understanding how people are wired, is the first indication of their unique potential and how they are talented. It should not only be part of any talent identification, selection and talent development initiative, but actually be the point of departure.

Talent development journey

The journey towards mastery and artistry of talent can be illustrated as follows:



Unconsciously incompetent

People are born with potential, but not with skills. Potential without skills stay potential. It is only an indication of what can be, but not of what is. A person can have exceptional linguistic potential to be a great speaker, but without learning the appropriate skills to present and speak and then practice those skills for a long time, the person will not become the speaker he or she potentially could be. This is the tragedy of many – the fact that they have never truly discovered what it is they have potential for. They are unaware of their potential and therefore unconsciously incompetent. Workers for whom this is the truth, will normally be disengaged workers – part of the 51% disengaged workers previously mentioned. People cannot be what they don't know.

“Unaware of potential”

Consciously incompetent

Some people are aware of their potential, but have not developed appropriate skills aligned with their potential, which makes them consciously incompetent with regards to how they are talented.

“Potential + no appropriate skills = potential”

Consciously competent (good)

Others have learned skills, but never discovered their true potential or have not developed skills that are aligned with their true potential and therefore are not the best they can be. They are consciously competent or even well skilled and good at what they do, but will not be passionate about what they do, because of the misalignment between their potential (neuro-design) and skills. If they are good at

what they do, it is because they have practiced and reinforced their skills well. More often than not, they are workers who produce a minimum performance to stay employed, but are not high potentials or high performers. Many people become stuck at this level of their talent development journey.

“Potential + average reinforced skills = average competence”

Unconsciously competent (great)

Talented and gifted people have merged their potential and skills and reinforced it exceptionally well, exhibiting high performance capability in a specific field until it becomes second nature. They have moved past the level of being consciously competent to a level of being unconsciously competent. They exhibiting high performance capability, but are not always aware why they are great at what they do. Producing consistent outstanding performance, for them, has become an automatic response. These individuals are “high potentials” who have aligned who they are with what they do, therefore engaging well in the workplace.

“Potential (neuro-design) + very well reinforced appropriate skills = Talented / Giftedness”

Mastery and artistry (excellence)

Continuously sharpening the saw, by modifying, optimizing, reinforcing and strengthening their talent over a long period, will lead people to reach levels of mastery, being experts at what they do. They will possess unusual capacity in a certain area of expertise. Few may even move on to a level of artistry, reflecting excellence and even sometimes perfection.

The journey to mastery and eventually artistry of a person’s talent, cannot have a more fundamental starting point than taking into consideration the neurophysiological aspects that influence a person’s talent and personality. Talent cannot effectively be improved if it cannot be measured. Assessing talent starts with assessing a person’s neuro-design, that will be an indication of the person’s potential and how that person is talented.

As an example, we now know that alignment between how people are naturally talented and the job functions they perform is crucial to be highly engaged and productive. Professionals responsible for selecting the right talent for the right position should not only take qualifications and experience into consideration, but even more so what the candidate is naturally talented for, risk for error and learning agility – gaps that has not sufficiently been addressed previously.

With technological advancements, the world has become a small place and the workplace will increasingly more consist of people from different nationalities. This means that all organizations are forced to become more inclusive in their approach to people development. It leaves them with no alternative but to have a global perspective on developing talent. There can be no better approach than following a neuroscience approach to talent development, as a brain has no culture, race or gender.

Neuroscience Strategy To Develop Talent And Build A Culture Of Learning

- Get support to integrate learning with company success
- Integrate learning with talent management & performance improvement
- to drive business results
- Create awareness about neuro-agility & culture of learning
 - Create personal development plans for every employee:
 - Measure drivers & neuro-design components
 - Create individual pathways of learning
 - Get accountability for the learning specified in those plans.
 - Optimize drivers that impact brain performance-
 - Develop skills to integrate the neuro-design components
 - Unlearn old habits & learn skills to future proof the organization
 - Monitor, reinforce, reward and recognize employee learning.
- Assess and develop neuro-agility, learning agility and learning ability
- Measure progress and results.
- Adjust, re-align and continuously improve and develop.

Any practitioner responsible for selecting and developing the talent of others should anchor their assessments and development initiatives into neuroscience, as it is an approach that are inclusive of all people. Therefore, having a neuroscience approach to talent development is not optional anymore, but mandatory.

Neuroscience of Performance Improvement

Performance improvement cannot start at any other place than getting the most out of your brain. To following analogy explains the impact of overall brain fitness. One horse pulls between two to three tons of weight, but two horses pulls between six to eight tons of weight. There is a multiplication effect when the two horses pull together. Similarly, there is a multiplication effect when the two hemispheres and all neural systems and brain regions start synergizing, creating optimized brain performance.

To ensure a person taps into all their cognitive resources to achieve top performance, they have to leverage all the drivers that impact their brain's performance. There is a compelling body of evidence that ties improved performance to drivers like brain fitness, stress coping skills, sleep, movement and exercise, optimistic mind-set and nutrition. These drivers can significantly improve our brain health, memory, focus, cognition and energy, thereby impacting productivity, engagement, learning agility, well-being and overall brain fitness.



From a talent development perspective, performance improvement starts with measuring a person's neurological design that will be an indication of that person's unique potential. Subsequently, potential will be changed into performance by aligning potential with appropriate skill sets and then modifying, optimizing and sufficiently practicing and reinforcing these skill sets until a satisfactory level of performance is achieved.

The neuroscience of performance improvement is intricately interwoven with the neuroscience of talent development. The interplay between the drivers that optimize brain performance and a person's neuro-design will determine how fast or slow they learn, how they process information, their level of risk for error, how effective they are and how efficiently they perform.

Having a global approach to performance improvement that is inclusive of culture, gender, and race, is not optional any more, but mandatory. The drivers that optimize brain performance is beneficial to all people, regardless of race, culture, gender or even the level of education for that matter. Therefore, following a neuroscience approach to performance improvement is a prerequisite to any person who is responsible for developing themselves or others.

PERFORMANCE



Module 4: Neuro-agility & why it matters



Dr André Vermeulen, corporate consultant, business innovator and student of neuroscience has been working in the field of talent development and performance optimization for more than 30 years. As a part time lecturer and member of the Neuroscience Research Group of the University of Pretoria, he stays current with the latest neuroscience research. He is a workplace learning specialist, using applied neuroscience to develop learning solutions that address client needs. As a business innovator, being in the frontline of experiencing workplace challenges with clients, he has developed a state of the art talent development and performance improvement system consisting of cutting edge neuroscience assessments and learning solutions.

“Knowing your unique neurological design and understanding the drivers that impact this, is the key to potential development and performance improvement”

His research on different talent development and performance improvement needs in a global market place that should be inclusive of culture, gender, and race, led him to formulate a new paradigm for talent development and performance improvement called neuro agility. It is a universal need, relevant to all people who need to learn, think, and process information easy and fast and be flexible to adapt to the challenges of constant disruptive change. For athletes to be at the top of their game and very competitive, they do not only have to execute their skills with precision, but have the fitness and agility that will allow them to execute those skills with ease, speed and the flexibility to think, learn and perform well under first time conditions.

Just like ballet dancers need the agility to move quickly and easy, executing their dancing skills with precision, today's workers need the neuro-agility to learn, think and draw conclusions fast and easy and be flexible in moving across ideas, experiences and understandings in such a way that they are able to maximize the learning value of any experience and apply that learning to perform well under first time conditions.



Neuro agility requires the whole brain to be ready to receive sensory stimuli and transmit bio-chemical impulses to all brain regions, establish new neural networks, retain, express, and apply information, change behaviour and perform according to potential.



Neuro agility underpins the brain's ability to be in-flow, learning fast and effectively, committing as little human error as possible. It requires being able to concentrate while engaging the whole brain effortlessly during cognitive processes like learning and thinking.



Neuro agility is about the readiness of all the senses and brain regions to function as one integrated whole brain system, being receptive and responsive to receive and transmit bio-chemical impulses at optimum capacity under new and potentially stressful conditions.

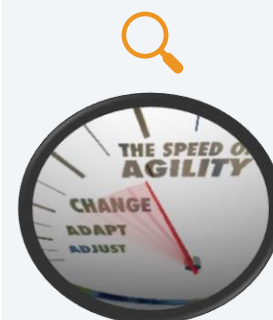
Neuro-agility is a construct whose time has come. This new neuroscience innovation offers the solution to developing the super learning skills people need for safeguarding themselves against future job losses, as it focuses on the neurological components of learning, thinking and cognitive processes – components that make people human and determine their competitive advantage. It provides fresh insights into how uniquely people learn and why some learn faster, easier and are more flexible than others – shedding light on issues such as learning problems and risk for error – issues that has not sufficiently been addressed before. This multi-dimensional, neuroscience framework, compliments and strengthens constructs like “ability to learn” and “learning agility”, but is neither exhaustive nor exclusive to any of these concepts.

The term “agility” refers to “the power of moving quickly and easily” and “the ability to think and draw conclusions quickly”. Before people can be learning agile, they need to optimize the drivers that influence their brain performance and integrate the neurophysiological components that impact their learning agility and learning ability. **Neuro-agility** helps people to **adapt, adjust, learn new skills** quickly, **unlearn unwanted behaviour** fast, be **flexible** in moving across ideas and understandings in such a way that they are able to maximize the potential learning value of a given experience. Neuro-agility enhances the degree to which people engage in agile learning.

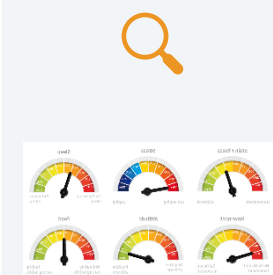
Developing neuro-agility is a prerequisite for the brain to function at optimum level as one integrated system without any neurological hindrances. It is about the readiness of all the senses and brain regions to function as one whole brain system, being receptive and responsive to receive and transmit bio-chemical impulses to all brain regions, establish new neural networks, retain, express, and apply information, change behaviour and perform according to potential. Neuro agility underpins the brain’s ability to be in-flow, learning fast and effectively, committing as little human error as possible. It requires being able to concentrate while engaging the whole brain effortlessly during cognitive processes like learning and thinking.

The framework for the construct of neuro agility was conceptualized according to two dimensions that includes drivers that optimize the brain’s performance and neurophysiological attributes that influence a person’s neurological design. The interplay between people’s neurological design (referred to as neuro-design) and the drivers that optimize their brain performance, significantly influences the ease, speed, and flexibility with which people learn and their propensity for error.

The construct of neuro agility is situated within the broader domain of learning. Neuro agility is an essential component of the “ability to learn” because it focuses on the neurophysiological attributes of learning, thinking and cognitive processes. This multi-dimensional, neuroscience approach, compliments and strengthens the ability to learn and learning agility, but is neither exhaustive nor exclusive to any of these concepts. The framework for neuro agility brings new constructs like neurological design and brain fitness into the arena of the meta-concept of “ability to learn”. It also offers innovative perspectives on the neuroscience of performance improvement, talent development and reducing risk for human errors.



Neuro-agility refers to the brain’s ability to learn quickly and easily, to think, learn and draw conclusions quickly and to be flexible in moving across ideas and understandings in such a way that they are able to maximize the potential learning value of a given experience and apply that learning to perform well under new or first-time conditions.



Drivers that optimize brain performance is:

- Brain Fitness
- Stress
- Sleep
- Movement
- Attitude
- Brain Food
- Physical Environment
- Learning Skills

Why neuro-agility matters

- It validates learning agility as it is anchored into neuroscience;
- It advances the relevance, importance and impact of learning agility
- It offers an inclusive approach requisite to all global learning practices;
- It serves as the point of departure in understanding how people learn;
- It offers innovative solutions on developing people's ability to learn;
- It showcases a conceptual framework for people's neurological design
- It advances the neuroscience of performance improvement and talent development
- It suggest new ways to approaching reducing risk of individual error
- It integrates easily with talent selection, talent development and performance improvement practices;
- It offers a higher return on investment on talent development and performance improvement initiatives when grounded in hard sciences;
- It separates facts from fiction, thereby solidifying learning practices;
- It offers new solutions to reducing risk for error;
- It significantly contributes to an individual's awareness, growth, learning and development.

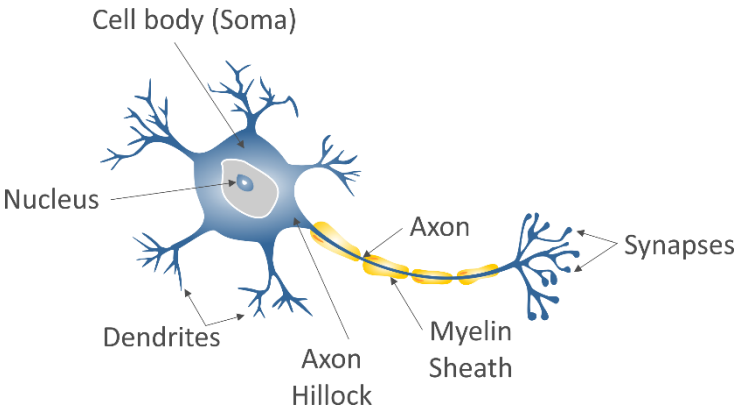
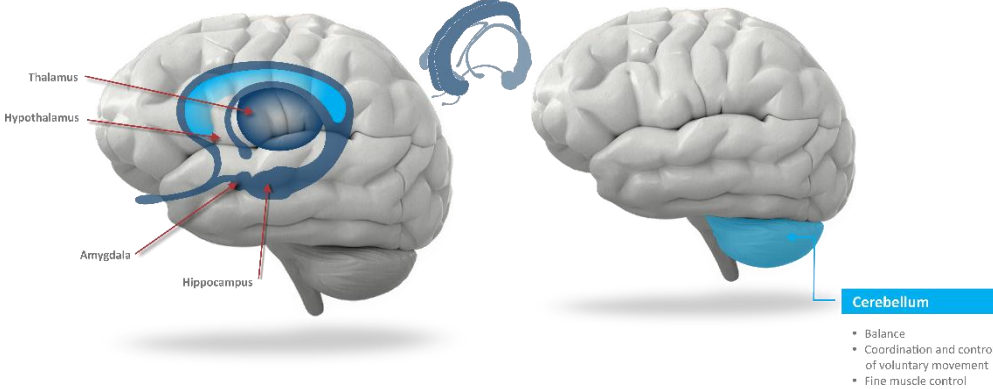


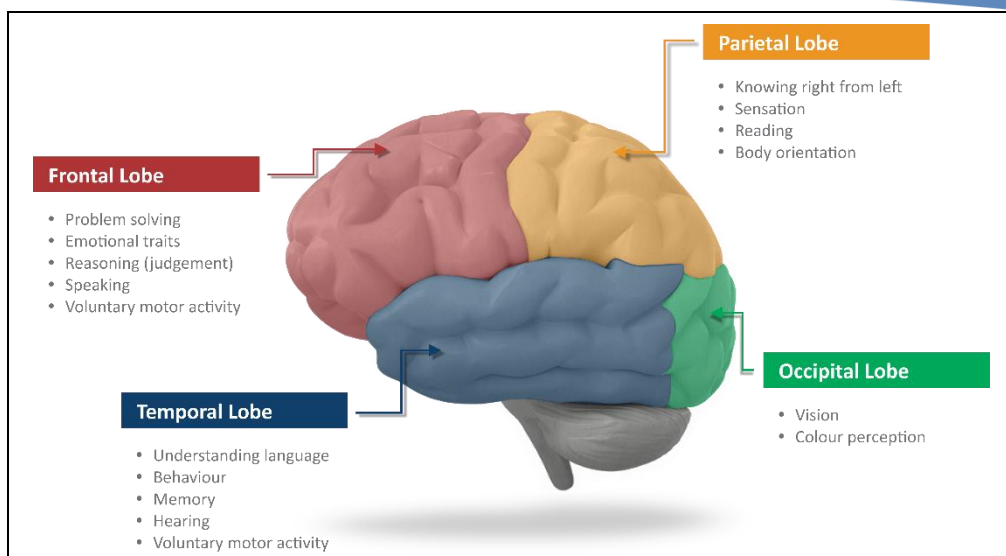
The neuro-design factors are:
 Relative lateralization,
 Expressive-receptive preference,
 Four quadrants,
 Rational-emotional preference,
 Brain and sensory dominance
 pattern,
 Sensory preference and
 11 intelligence preferences



Module 5: An Introduction to the brain areas & brain basics

Vocabulary list

	
Neurons	Cells that communicate events in and outside of the body
Axons	Carry information on neurons to end feet
Dendrites	Receptors on neurons receiving information
Synapse	Chemical bridge from one neuron to the next
Myelin	Fatty insulation around neurons
Neurotrophins	Proteins that induce the survival, development and function of neurons
	
Reptilian Brain	Area for basic survival and self-defense (Medulla, Pons and Cerebellum)
Limbic System	Area of brain involved with processing emotions
Cerebellum	Balance and co-ordination area of the brain
Neo-cortex	Outer layer of cerebrum where synthesis and major thought processes occur



Frontal Lobe	Area of neo-cortex associated with synthesis of ideas, compassion and altruism
Parietal Lobe	Area of neo-cortex for information synthesis and storage of all sensory areas (proprioception, touch)
Temporal Lobe	Area of neo-cortex associated with auditory and olfactory function
Occipital Lobe	Area of neo-cortex associated with visual functions
Motor Cortex	Area of neo-cortex where all motor function originates
Sensory Cortex	Area of neo-cortex where all sensory functions are received and deciphered (proprioception, touch, temperature)
Right Hemisphere (Gestalt)	Brain hemisphere associated with creativity, movement, intuition and subjective reasoning
Left Hemisphere (Logic)	Brain hemisphere associated with organization, language, linear function and objective reasoning
Corpus Callosum	Nerve fibers that connect right and left hemispheres
Sympathetic	Automatic system associated with body stress and survival – fight or flight
Parasympathetic	Automatic system associated with relaxed body functioning

<p>THE LEFT HAND FOCUSES ON:</p> <ul style="list-style-type: none"> • Gross-motor activities • Non-verbal gestures and body language 	<p>THE RIGHT HAND FOCUSES ON:</p> <ul style="list-style-type: none"> • Fine-motor activities • Written and verbal communication
<p>THE LEFT EYE:</p> <ul style="list-style-type: none"> • The far-sighted eye • Tracks from right to left – reading difficulty • Focuses on colour, shapes and feelings 	<p>THE RIGHT EYE:</p> <ul style="list-style-type: none"> • The near-sighted eye • Tracks from left to right – reading eye • Focuses on visual order, sequence and detail
<p>THE LEFT EAR LISTENS TO:</p> <ul style="list-style-type: none"> • Emotions • Rhythm and tone of voice • How things are said • Non-verbal content 	<p>THE RIGHT EAR LISTENS TO:</p> <ul style="list-style-type: none"> • Words / language • Facts and details • What is said • Verbal content

The structure and components of the brain

The **nervous system** is our body's decision and communication centre.

The **central nervous system (CNS)** is made up of the brain and the spinal cord and the **peripheral nervous system (PNS)** is made of nerves.

Together they control every part of our daily life, from breathing and blinking to helping us memorise facts for a test. Nerves reach from our brain to our face, ears, eyes, nose, and spinal cord... and from the spinal cord to the rest of our body.

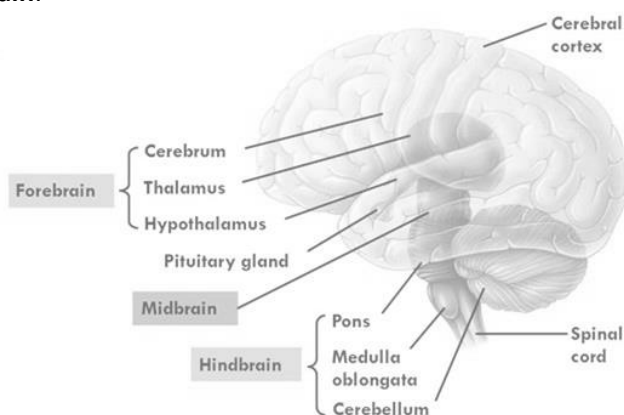
Sensory nerves gather information from the environment, sends that information to the spinal cord, which then speeds the message to the brain. The brain then makes sense of that message and fires off a response.

Motor neurons deliver the instructions from the brain to the rest of our body.

The **spinal cord**, made of a bundle of nerves running up and down the spine, is like a superhighway, speeding messages to and from the brain every second.

The brain itself, is made of **three main parts**:

1. the **forebrain**,
2. **midbrain**, and
3. **hindbrain**.



- The forebrain consists of the **cerebrum**, **thalamus**, and **hypothalamus** (part of the limbic system).
- The midbrain consists of the **tectum** and **tegmentum**.
- The hindbrain is made of the **cerebellum**, **pons** and **medulla oblongata**.
- Often the midbrain, pons, and medulla are together referred to as the **brainstem**.

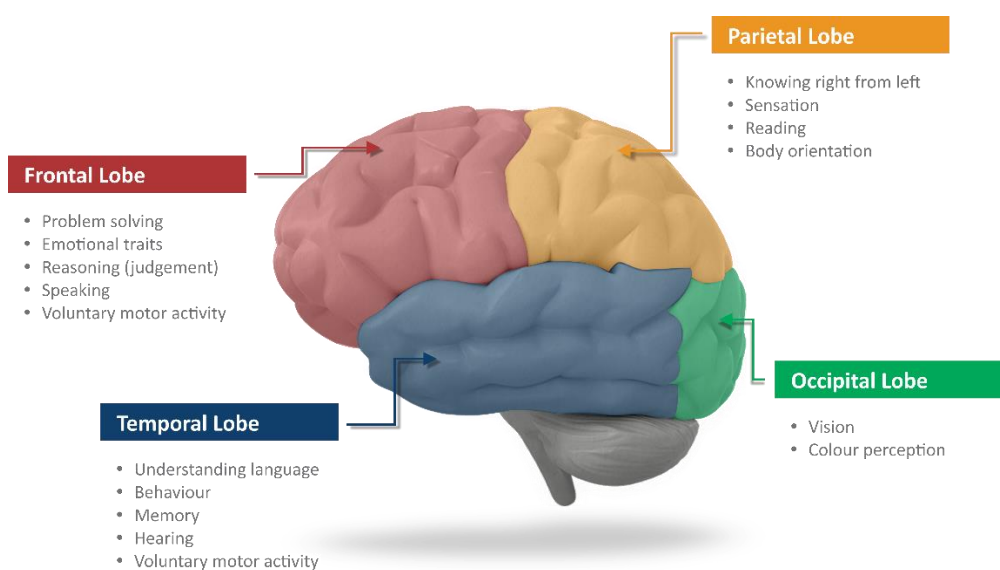
Let us explore the major areas of the brain in more detail . . .

The Cerebrum

The cerebrum or **cortex**, is the largest part of the human brain and is associated with higher brain function such as **thought** and **action**.

The cerebral cortex is divided into **four sections**, called "lobes":

- the **frontal** lobe,
- **parietal** lobe,
- **occipital** lobe, and the
- **temporal** lobe.



- **Frontal Lobe** – is associated with reasoning, planning, parts of speech, movement, emotions, and problem-solving.
- **Parietal Lobe** – is associated with body orientation, recognition and perception of stimuli.
- **Occipital Lobe** – is associated with visual processing.
- **Temporal Lobe** – is associated with perception and recognition of auditory stimuli, memory, and language.

Note that the **cerebral/neo-cortex** is highly wrinkled. Essentially, this makes the brain more efficient, because it can increase the surface area of the brain and the number of neurons within it.



*In humans, 90% of the cerebral cortex is **neo-cortex**.*

*The **cerebral cortex** and the **neo-cortex** are the same thing. The cerebral cortex is the outer layer of the brain. It consists of 6 cell layers. It was the last part of the brain to evolve, hence the term 'neo-cortex'.*

A deep furrow divides the cerebrum into **two halves**, known as the **left** and **right hemispheres**.

The two hemispheres look mostly symmetrical, yet it has been shown that each side functions slightly different than the other.



Generally, the **right hemisphere** is associated with **creativity** and the **left hemisphere** is associated with **logic abilities**.

Nerve cells make up the **grey surface** of the cerebrum which is a little thicker than your thumb.

White nerve fibres underneath, carry signals between the nerve cells and other parts of the brain and body.

The **neo-cortex** occupies the bulk of the cerebrum. This is a six-layered structure of the cerebral cortex which is **only found in mammals**.

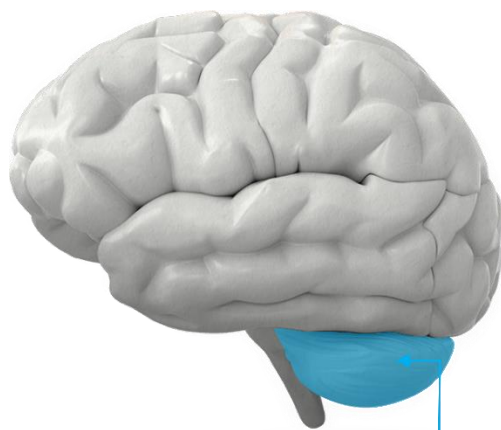
The neo-cortex is a recently evolved structure and is associated with **"higher" information processing** by more fully evolved beings (such as humans, primates, dolphins, etc).



For more information about the neo-cortex, [click here](#).

The Cerebellum

The cerebellum, or "**little brain**", is similar to the cerebrum in that it has two hemispheres and has a highly folded surface or cortex. This structure is associated **with regulation and coordination of movement, posture, and balance.**



Cerebellum

- Balance
- Coordination and control of voluntary movement
- Fine muscle control

The cerebellum is assumed to be much older than the cerebrum, evolutionarily.

In other words, animals which scientists assume to have evolved prior to humans; for example, reptiles, do have developed cerebellums.

However, reptiles do not have a neo-cortex.



Go to the following web site for a more detailed look at [evolution of brain structures and intelligence](#)

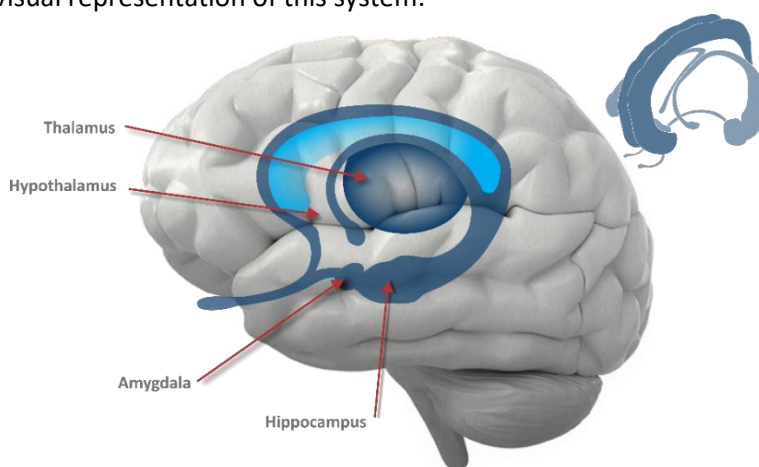
Limbic System

The limbic system, often referred to as the "**emotional brain**", is found buried within the cerebrum. Like the cerebellum, evolutionarily the structure is rather old.

This system contains the:

- **thalamus,**
- **hypothalamus,**
- **amygdala, and**
- **hippocampus.**

Here is a visual representation of this system:



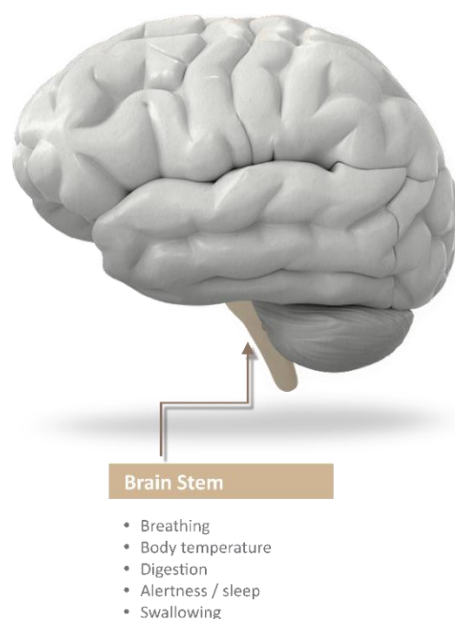
Thalamus	The thalamus is a large mass of grey matter deeply situated in the forebrain. This structure has sensory and motor functions. Almost all sensory information enters this structure where neurons then send the information received to the overlying cortex.
Hypothalamus	This structure is involved in functions including homeostasis, emotion, thirst, hunger, circadian rhythms, and control of the autonomic nervous system. In addition, it controls the pituitary gland.
Amygdala	The amygdala is located in the temporal lobe and is involved in memory, emotion, and fear. The amygdala is large and located just beneath the surface of the temporal lobe.
Hippocampus	This part of the brain is important for learning and memory . . . for converting short term memory to more permanent memory, and for recalling spatial relationships in the world around us.



[Click here](#) if you are interested in knowing more about the functions of the Limbic System

Brain Stem

Underneath the limbic system is the **brain stem**.



This structure is responsible for **basic vital life functions** such as breathing, heartbeat, and blood pressure.

Scientists say that this is the "simplest" part of the human brain, because most animals' entire brains, such as reptiles (who appear early on the evolutionary scale) resemble our brain stem.

The brain stem is made of the:

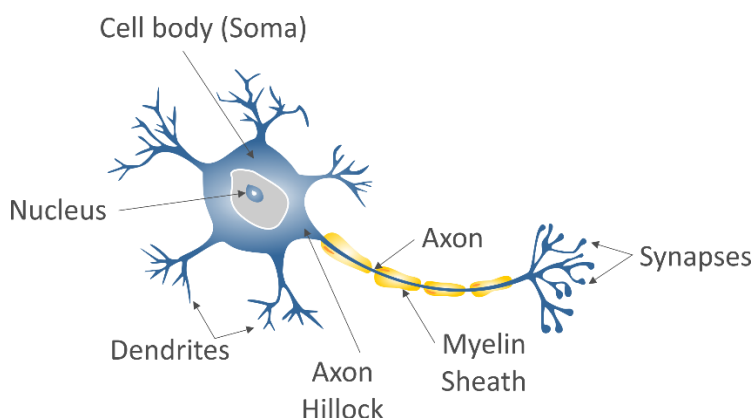
1. **midbrain,**
2. **pons,** and
3. **medulla.**

Midbrain / Mesencephalon	It is involved in functions such as vision, hearing, eye movement, and body movement.
Pons	It is involved in motor control and sensory analysis; for example, information from the ear first enters the brain in the pons. It has parts that are important for our level of consciousness and for sleep. Some structures within the pons are linked to the cerebellum, thus are involved in movement and posture.
Medulla Oblongata	This structure is the part of the brain stem, between the pons and spinal cord. It is responsible for maintaining vital body functions, such as breathing and heartrate.




The role of neurons

Neurons have three basic parts:

1. **Cell body or soma**
 2. **Axon**
 3. **Dendrites or nerve endings**
- **Cell body or soma.** This main part has all of the necessary components of the cell, such as the nucleus (which contains DNA), endoplasmic reticulum and ribosomes (for building proteins) and mitochondria (for making energy). If the cell body dies, the neuron dies.
 - **Axon.** This long, cable like projection of the cell carries the electrochemical message (nerve impulse or action potential) along the length of the cell. Depending upon the type of neuron, axons can be covered with a thin layer of myelin sheath, like an insulated electrical wire. Myelin is made of fat and protein, and it helps to speed transmission of a nerve impulse down a long axon. Myelinated neurons are typically found in the peripheral nerves (sensory and motor neurons), while non-myelinated neurons are found in the brain and spinal cord.
 - **Dendrites or nerve endings.** These small, branch-like projections of the cell make connections to other cells and allow the neuron to talk with other cells or perceive the environment. Dendrites can be located on one or both ends of a cell.



Neurons come in **many sizes**. For example, a single sensory neuron from your fingertip has an axon that extends the length of your arm, while neurons within the brain may extend only a few millimetres.

Type of Neuron	They also have different shapes depending on their functions.	These fundamental members of the nervous system also vary with respect to their functions .
 <p>Multipolar (Motor neuron)</p>	<p>Motor neurons that control muscle contractions have a cell body on one end, a long axon in the middle and dendrites on the other end.</p>	<p>Motor neurons carry signals from the central nervous system to the outer parts (muscles, skin, glands) of your body.</p>
 <p>Unipolar (Sensory neuron)</p>	<p>Sensory neurons have dendrites on both ends, connected by a long axon with a cell body in the middle.</p>	<p>Sensory neurons carry signals from the outer parts of your body (periphery) into the central nervous system.</p>
 <p>Bipolar (Interneuron)</p>	<p>Interneurons or associative neurons, carry information between motor and sensory neurons.</p>	<p>Interneurons connect various neurons within the brain and spinal cord.</p>

The simplest type of neural pathway is a **monosynaptic** (single connection) **reflex pathway**, like the knee-jerk reflex.

When the doctor taps the right spot on your knee with a rubber hammer, receptors send a signal into the spinal cord through a sensory neuron. The sensory neuron passes the message to a motor neuron that controls your leg muscles. Nerve impulses travel down the motor neuron and stimulate the appropriate leg muscle to contract. The response is a muscular jerk that happens quickly and does not involve your brain.

Humans have lots of hardwired reflexes like this, but as tasks become more complex, the pathway circuitry gets more complicated and the brain gets involved.



Some interesting facts about the brain



Some more BRAIN FACTS DID YOU KNOW?

An Infographic

- The brain has a **trillion** brain-cells, including **100 billion** active nerve-cells and **900 billion** other cells that “glue”, nourish and insulate the active cells, and can grow up to **20 000 “branches”** on every one of those 100 billion nerve-cells.
- ... sends messages at **120 m/per second**.
- Has three (3) distinct brains in one:
 - An **instinctive** brain
 - An **emotional** brain
 - A **rational** brain
- Has two (2) sides that work in harmony:
 - The **left “logic / academic”** brain
 - The **right “gestalt / creative”** brain
- Has **four** (4) distinct lobes.
- Runs a **“telephone exchange”** that shuttles **millions** of messages per second between the left and right sides.
- Has **twelve** (12) different **“intelligence centres”**.
- Operates on at least **four** separate wavelengths.
- Controls a transmission system that flashes **electro-chemical** messages instantly to every part of your body.
- The **non-dominant** brain hemisphere **“switches off”** under excessive stress.
- Some people only **ACCESS one** brain hemisphere at a time.
- The **left eye dominant** person would prefer to read from right to left.
- We use approximately **0,5 - 5%** of our brain's **potential**.
- The **right ear dominant** person listens to what people say - the **left ear dominant** person listens to **how** people say things..
- The brain generates approximately **20 watts** of electricity.
- A single brain cell can handle up to **50 000 messages per minute**, which is more than the average secretary handles in **5 years**.

The question is therefore:

Do we have the brain power (potential) to adapt to our ever changing environment and thrive in this new information-driven world?

The answer is – **We have more brain power than we can ever attempt to use up!**

The electrochemical functioning of the brain

The brain functions **electrochemically**. There are two important principles here;

- Electricity, and
- Chemicals.



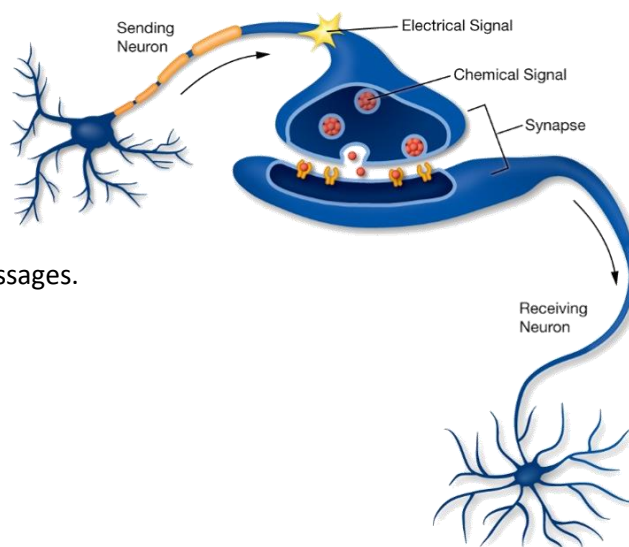
When we look at this picture, it is an enhanced image of what our brain cells look like when sending electrochemical messages from one cell to another.

As mentioned previously, your brain is made of approximately 100 billion nerve cells, called **neurons**.

Neurons have the amazing ability to **gather and transmit electrochemical signals**. Think of them like the gates and wires in a computer.

Neurons share the same characteristics and have the same make-up as other cells, but the electrochemical aspect lets them transmit signals over long distances to send messages to each other.

There are many chemicals, but two categories – **facilitator** neurotransmitter chemicals that transmit electrical impulses between neurons and **inhibiting** chemicals that slow down and hinder transmission of messages.



We will discuss **electrochemical functioning of the brain** in much more detail in Module 6.

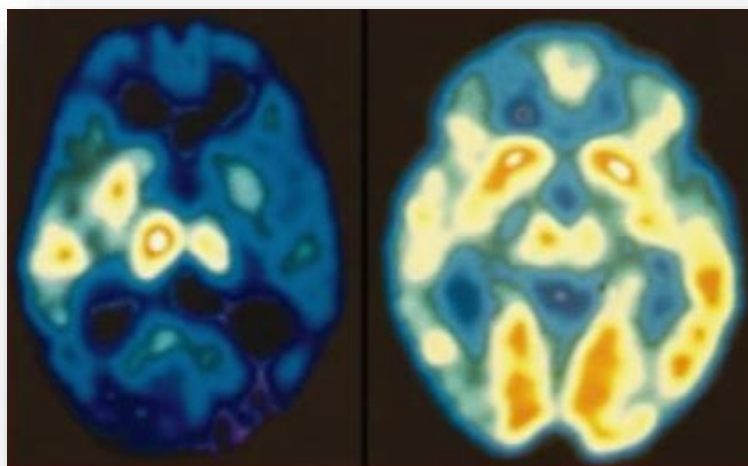
Neurophysiological Mechanisms & Dynamics That Impact Brain Function

Neuroscience is an interdisciplinary science which means that empirical research from other disciplines such as education and psychology, must be included and considered when researching new neurological constructs. Some scientists may only focus on principles and research inside their disciplines' field of expertise that they are familiar with, but may not understand or consider the impact of mechanisms or dynamics relevant to other disciplines. The purpose of this section is to clarify some principles, dynamics and mechanisms that will strengthen understanding the construct of neuro-design and its greater impact on neuro agility.

Neurological Dominance

The science of learning provides evidence of a significant reciprocal relationship between neurological dominance and why people learn, think, and behave differently, why we process information uniquely, why we are smart in different ways and how we are talented. Lack of accurately understanding the concept of neurological dominance and how it relates to the construct of neuro-design, has caused many to miss-interpret or de-bunk principles relevant to neuro agility.

Our human species have been designed with 2 brain hemispheres, 2 eyes, 2 ears and 2 hands, with the purpose of using both. We are all whole brained most of the time. Even if we are whole brained, MRI and PET scans prove that at a given time, there will be more activity in one hemisphere over the other. This visually illustrates what dominance is all about. All people have a dominant brain hemisphere, eye, ear, and hand. In this context, the definition for dominance is it is the hemisphere, eye, ear, or hand that leads, while the other follows.



Prevailing research in neuroscience avoids the definite left-right brain labels as many have oversimplified the conclusions of Nobel Prize Laureate Roger Sperry's discovery of the differences of left- and right brain hemisphere functions, which is unwarranted by the literature. Scientists now use the term "relative lateralization",

as much of Roger Sperry's original work remains valid today. It can still safely be said that the left hemisphere processes information in an analytical, sequential way, while the right hemisphere processes information in a random holistic way. Although we are using both hemispheres of the brain most of the time, it can also be said with impunity that at any moment, there will be more activity in one hemisphere than the other. It can also not be argued that some people starts solving problems by following an analytical approach and others follow a conceptual, holistic and creative approach. All people think, learn, create and solve problems, but in different ways, depending on our preferences.

The eyes are the only part of the brain that is visible. It illustrates how the brain works. To illustrate dominance, one only must look at how the eyes function when processing information. If a person looks through a rolled-up paper at an object with both eyes, one eye leads (focuses), while the other follows. The dominant eye will be aligned with the rolled-up paper. This clearly illustrates that although the person looks at the object with both eyes, the dominant eye will actively process information while the non-dominant eye follows more passively.

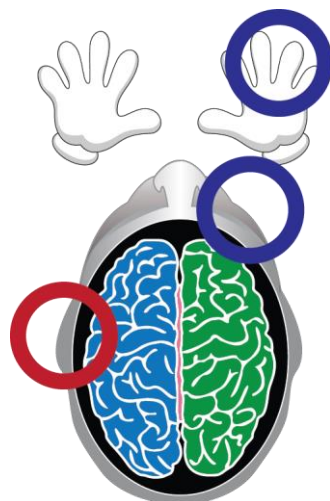


Neurological dominance is a natural part of our design. All people have a unique genetic coding which will influence our predisposition towards which hemispheres, and senses will lead (dominate) when processing information. When one person speaks to another, but the other person cannot hear clearly, it may be that the person who cannot hear clearly, may turn one ear towards the other person. This response indicates an auditory dominance response. It illustrates that although we have two brain hemispheres, eyes, ears, and hands, and use both to process information, there will always be a dominant brain hemisphere, eye, ear, or hand that takes the lead to process information actively, while the other one follows, processing information more passively.

Just like the muscles you use must become stronger, so does the brain hemisphere and senses that lead when we process information and learn, become dominant. As people learn and develop, we strengthen neural networks that connect different brain regions and the senses we prefer to use, making certain parts lead stronger and others follow. As a result, we develop physiological preferences for using some brain hemispheres, brain regions and senses over others. These neural networks make it easier to think, learn and create in ways that are consistent in our preferences, hence the reason all people think, learn, and act in different ways.

Understanding a person's neuro-agility primarily begins with an accurate understanding of their neurological dominance patterns, consisting of their unique combination of brain hemisphere, eye, ear, and hand dominance. It helps us understand the very foundations of our personalities and risk for error. It is the blue print of who we are and explains the ways in which we differ and how to improve

our effectiveness. By learning to understand our unique information processing style and those of others, we learn to respect our personal wiring and the uniqueness of others. It makes understanding, connecting, establishing social bonds, and synergizing with others much easier. Neurological dominance has numerous applications in the areas of personality, relationships, whole brain communication, emotional intelligence development, potential identification, and team functioning.



Dominance is essential to our survival and how we think, learn, and behave, as it provides us with an automatic response in any given situation, especially new or stressful situations. It helps us understand our preferences. Understanding our preferences help us understand who we are and how we are talented. Aligning who we are (how we are talented, gifted and smart) with what we do, improves engagement, happiness and our performance.

Based on our unique neurological wiring and coding, all people have different preferences of brain hemisphere, eye, ear, and hand dominance. It results in 16 different combinations of how people process information that forms the foundation of our neurological design.

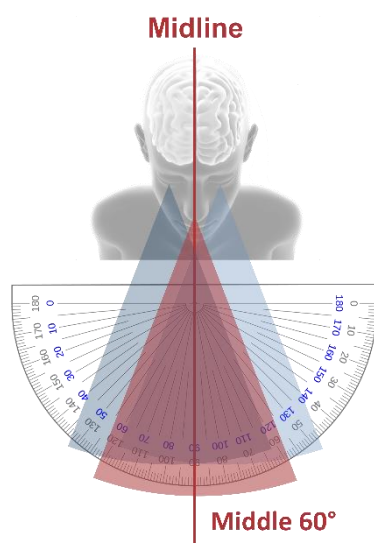
Homolateral / Bilateral Functioning

The brain consists of two hemispheres. The left brain hemisphere controls the right side of the body and vice versa. When we are born, we alternate between the hemispheres, utilizing only one hemisphere at a time, processing information in a parallel (one sided) manner rather than a bilateral (also referred to as cross-lateral) manner. When people alternate between the two brain hemispheres when processing information, it is referred to in educational terms as difficulty with midline crossing. It is also referred to as homolateral functioning. The picture illustrates how parallel processing will influence physical movement. The person is asked to do a crawling related (cross lateral) movement, moving the arm and opposite leg. Instead the person moves the arm and leg on the same side of the body.

The midline is an imaginary line down the centre of the body that divides the body into left and right. Crossing the body's midline is the ability to reach across the middle of the body with the arms and legs. To be able to cross the midline we need to use both brain hemispheres simultaneously. Crossing the midline allows people to



perform a task on the opposite side of their body. Most activities in life require bilateral (two sided) functioning as using both eyes and ears requires us to be able to cross the midline. The picture below illustrates a bilateral movement.



The following analogy clarifies hemispheric functioning. When a person moves from point A to B, but only jumps on one leg to get there, it will be slower and take longer for the person to get there. When people function in a homolateral manner, they alternate between using the left or right brain hemispheres, slowing them down and causing learning, thinking or processing information to be slower, harder and more difficult. In educational terms, this will be referred to as difficulty with crossing the midline. In popular terms and to make the principle easier understandable, homolateral functioning can be referred to as lack of brain fitness. This will directly impact their neuro agility negatively.

When a person moves from point A to B, walking with both legs, it will be easier and faster. The person may even run, getting to point B faster. When people function in a bilateral manner, they will use both hemispheres to process information simultaneously. Bilateral functioning makes learning, thinking and processing information easier and faster, allowing that person mental flexibility to adapt to change in new situations faster. In educational terms, it means the person crosses the midline with ease because of using both brain hemispheres simultaneously. Bilateral functioning is a prerequisite for neuro agility.

Using both brain hemispheres simultaneously, is a learned response, not an automatic response. People are born with two legs, but have to learn the skill to use both to walk. Similarly, we have to learn how to use both brain hemispheres simultaneously. Crawling for example is one of the most basic ways for infants to start learning to use both brain hemispheres, as it requires both hemispheres to function simultaneously in a bilateral fashion.

Just because people learned to crawl when they were babies, however does not imply they function in a bilateral way. Crawling is only an example of one of many activities needed to help people become bilateral. It is one thing to become bilateral, being able to cross the midline with ease and speed. It is another to stay

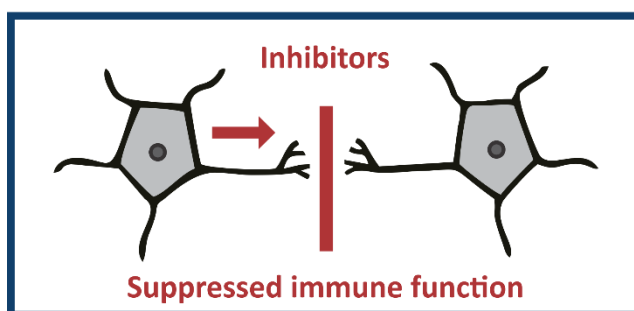
bilateral. The brain is a progressive organ. It either progresses or regresses, but it never stays the same. Neuroplasticity tells us that new neural networks are formed all the time and that old neural networks become dormant, if not continuously reinforced. This validates the statement: “If you don’t use it, you lose it”. This principle applies to bilateral functioning as well. If a person stops doing activities that continuously strengthen their bilateral neural networks, they **lose their bilateral functioning and become homolateral again.**

Being able to cross the midline in a bilateral manner can popularly be referred to as being brain fit, as using both brain hemispheres simultaneously causes ease, increases the speed and improves the flexibility with which people learn, think and process information. Bilateral functioning is a vital prerequisite for neuro agility.

Neurological Stress & Fatigue

The result of disruptive change is that people are constantly experiencing feelings of burn-out, stress and fatigue. Short bursts of stress are not the problem. Continued stress and fatigue however, are the brain’s greatest enemies. During stress, the brain releases cortical inhibitors that decrease or inhibit electrochemical transmission in certain brain regions.

Negative Emotions / Pessimism / Stress / Fear



BAD FUEL!

This is referred to as neurological stress. It causes the non-dominant brain regions to “switch off”, leaving the dominant brain regions to carry on with its primary functions. Stress thus limits people’s performance, learning effectiveness, information processing abilities, and overall learning agility, causing them to become either too logical (more left hemisphere) or too creative (more right hemisphere) oriented than the whole brain person they can and should be.

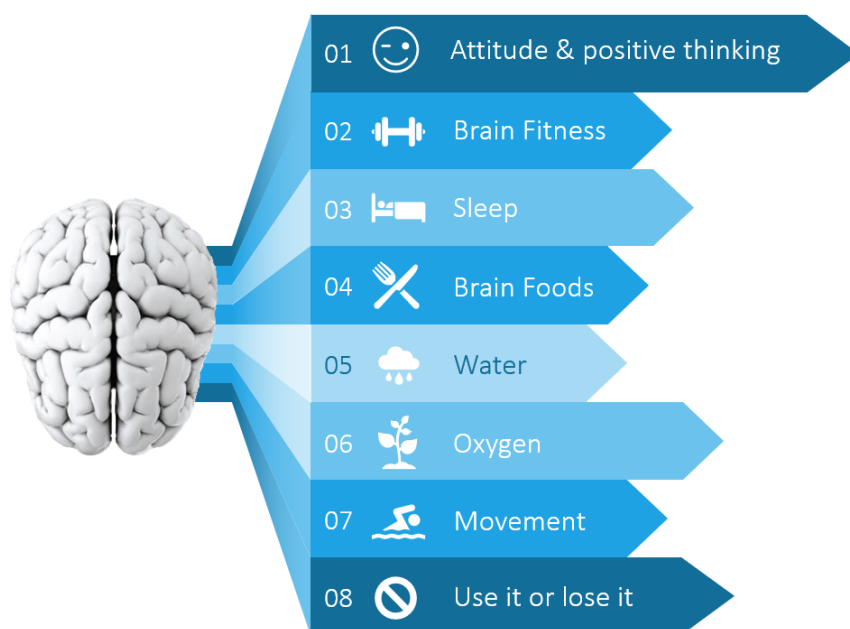
When people are homolateral (less brain fit, alternating between hemispheres), or experience continued stress or fatigue (mainly due to lack of rest and sleep), their dominant senses opposite the dominant hemisphere will be adept at processing information. If their dominant senses are on the same side as the dominant brain hemisphere, their information processing ability may be inhibited and sensory transmission may become limited during stress or fatigue, causing neurological hindrances that may increase people’s risk for error.

Brain Basics

The brain can be compared to the most powerful sports car on earth. It may have unlimited power, but if a person does not have a key for it, does not have the skill to drive it, does not know what fuel it needs, or does not know how to maintain it, it cannot perform like something with unlimited power.

This principal is applicable to humans as well. The brain has unlimited power, but cannot perform as well as it is supposed to, if we do not know how to prepare and activate it for performance, or maintain it properly.

In order to increase the brain's performance, a person has to align their life style with the following **brain basics**:



We will discuss each of these brain basics in more detail on the pages following. . .

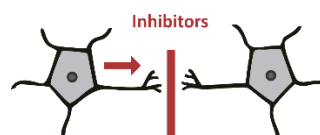
Attitude and positive thinking

The first step towards mental integration is to **create a physiological environment** in the brain, conducive for learning and integration.

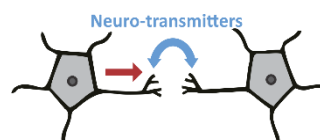


Remember:

When people think **negative** thoughts, they secrete **inhibitor chemicals** which block or limit the flow of electrochemical impulses.



When people think **positive** thoughts, they secrete **neurotransmitters** which facilitate thinking, learning and creativity.



Attitude: a settled way of thinking or feeling about something.

Attitude, refers to the way you habitually think about yourself and the world around you.

Whole brain utilisation – Brain fitness

We mentioned being “Brain fit” previously. But just to recap;

The two hemispheres of our brain work either **homolaterally** or **bi-laterally integrated**.

All people are born homolateral. Therefore, if we are homolateral, it means that we use one brain hemisphere at a time, in an alternating fashion. If you are bi-lateral, it means that we use both hemispheres simultaneously (at the same time).

To illustrate this;

If you try and get to the entrance of a building by jumping on one leg only, it will get you there, but it is going to take you longer and may be harder for you to do. You will also be slower (as opposed to someone walking using both feet), get tired quicker and you may not enjoy it that much.

This is often how learning and thinking is for some people, who use one brain hemisphere at a time in an alternate fashion. It may even slow them down.

In the world of education, this type of person is often referred to as someone who has difficulty “**crossing the midline**”.



The word “homo”, means one and the word “bi” means two.



We will discuss **brain fitness** in much more detail in Module 8.

Sleep / Brain wave rhythms
















Sleep is essential for brain health and optimum brain performance.

To appreciate the **quality of our sleep**, we need to understand our brain wave rhythms.

You get different brain wave rhythms, each of which influence your **levels of alertness**.

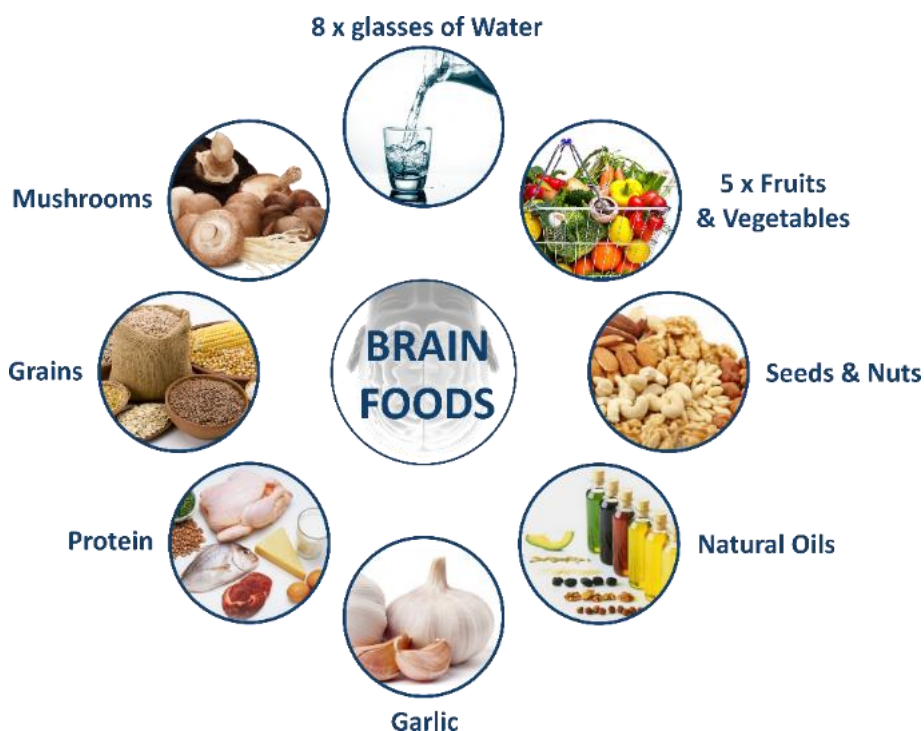


We will discuss *sleep* in much more detail in Module 8.

Brainwave State	Wave Frequency	Characteristics
γ GAMMA WAVE   	29 – 40 cps	SUPER-CONSCIOUS / EXCITED Stress – Higher Level Consciousness – Hyper Concentration & Focus
β BETA WAVE   	13 – 28 cps	ACTIVE Practical – Alert – Performance – Doing
α ALPHA WAVE   	8 – 12 cps	RELAXED / FLOW STATE The “Zone” – Positive Thinking – Accelerated Learning
θ THETA WAVE   	4 -7 cps	DROWSY / SUB-CONSCIOUS Deep relaxation – Dreaming – Creative Thought
δ DELTA WAVE   	0,5 – 3 cps	SLEEP / UNCONSCIOUS Deep Dreamless Sleep – Healing

Brain foods and diets

Brain Foods = Nature's produce



We will discuss *brain food* in much more detail in Module 8.

When we talk about brain food, we are referring to **nature's produce**. If we look at the illustration, we see a representation of nature's produce and no artificial, processed or commercialised man-made products. This implies a healthy and natural lifestyle, and avoiding quick fixes and fast foods as much as we possibly can. With **moderate usage**, most foods can be eaten without serious energy blockages.

Water



As adults, we need to drink at least **8 glasses of water per day**.

What research tells us, is that when people drink their 8 glasses of water per day, the water enhances the haemoglobin's (the red blood cells') ability to **take on more oxygen**. In other words, more oxygen particles are sucked into the blood stream and therefore, more oxygenated blood goes to the brain. Hydration is the key to **cerebrospinal fluid** production which enhances our focus. Cerebrospinal fluid is mainly composed out of water and sodium chloride bicarbonate ions.

We will discuss “water” as a brain principle in itself, in more technical detail later in module 8.

Below are a few of the **health benefits** of drinking sufficient water:

- 75 – 80% of your total body mass consists of water.
Water constitutes:
 - 75% of your brain.
 - 83% of your blood volume.
 - 22% of your bones.
 - 75% of your muscles.
- Drinking water helps to regulate your body temperature.
- Water helps your body to absorb nutrients. Drinking water on an empty stomach, purifies the colon, making it easier to absorb nutrients.
- Water removes waste and toxins from your body, and even reduces the risk of cancer.
- Water keeps your skin glowing and clear and makes you look younger and healthier.
- It protects and cushions your joints and vital organs.
- Water helps convert food to energy.
- It moistens oxygen for breathing.
- Water helps carry nutrients and oxygen to your cells, and increases the production of new blood and muscle cells.
- Drinking a lot of water helps with weight loss. Drinking ± 500 ml (16 ounces) of chilled water in the morning can boost your metabolism by 24%.
- Water balances your lymphatic system. Lymph glands help you to perform daily functions, balance your body fluids and fight infection.
- Water is a natural remedy for headache.
- Being sufficiently hydrated relieves fatigue and improves your productivity and mood.

Oxygen



As you are reading this, you are breathing. Oxygen is going into your lungs, and then in your red blood cells, the haemoglobin sucks the oxygen particles into your blood stream.

Oxygenated blood then goes to your brain.

The brain extracts this oxygen and the “oxygen poor” blood goes back to the heart, and the process circulates. So, oxygen is a vital fuel for the brain.

Your brain runs on oxygen just like a motorcar runs on petroleum.

We mentioned previously, (and it is also fairly obvious) that you get oxygen through breathing, that’s why deep breathing is highly recommended to oxygenate your blood before and during performing any action or activity as well as when learning.

Exercise is good for your body and good for your brain. Exercise enriches your blood with oxygen.

*Cut off the supply of oxygen and you destroy brain-cells.
Stop it completely and you die!*



How to get more oxygen into your bloodstream and your brain:

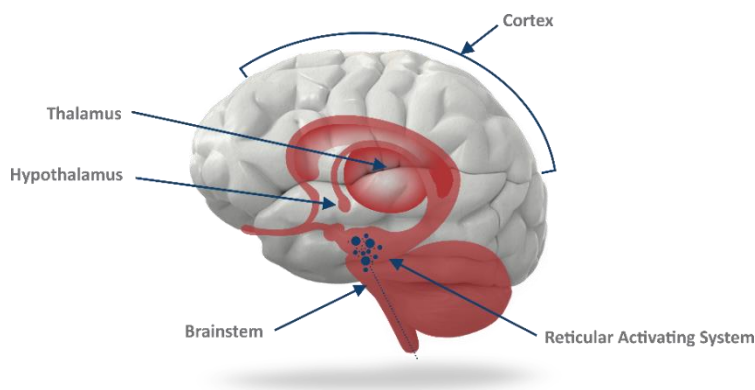
1. Do breathing exercises - Breathe slowly and deeply (4 x in, 4 x hold, 4 x out, and 4 x hold).
2. Do physical exercise.
3. Drink 8 glasses of water.
4. Surround yourself with plants in your personal and work environment.

Movement

“Movement is the door to learning” Paul E. Dennison

When you move, you stimulate the motor-cortex of the neo-cortex of the brain through the **reticular activation system**. This creates a diffusion effect that occurs throughout the whole brain, stimulating all of the senses, major thought areas and major memory centres.

This system therefore wakes up the thinking centres of the brain, and that is why we say movement is the **“door to learning”**.



The **reticular activation (activating) system**, or RAS, is a piece of the brain that starts close to the top of the spinal column and extends upwards around two inches.

It has a diameter slightly larger than a pencil.

All of your senses (except smell, which goes to our brain's emotional center) are wired directly to this bundle of neurons that's about the size of your little finger.

Often, the RAS is compared to a filter or a nightclub bouncer that works for your brain. It makes sure your brain doesn't have to deal with more information than it can handle.

Thus, the reticular activating system plays a big role in the sensory information you perceive daily.



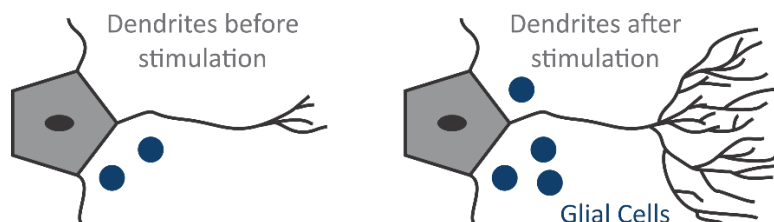
We will discuss **movement** in much more detail in Module 8.

Use it or lose it - Challenge

Generally, aging itself does not have a large impact on deterioration of brain function. While a debate continues around this issue, it is clear that the primary assailants on neurons are:

- Medication
- Disease (especially heart disease)
- Extended grief over personal losses
- Alcohol
- A dull, unchallenging life-style
- Lack of exercise
- Lack of oxygen
- Lack of sleep
- Lack of stimulation
- A low educational level and absence of curiosity or a desire to learn
- Malnutrition
- Depression

The more we use our brains, (even during aging), the higher our performance level stays and the higher our ratio of synapses to neurons is – our brains stay denser the more we use them.



Nerve growth factor (NGF) is one of many trophic, or nutritional agents that stimulate and support **growth of the myelin sheath** – the coating of the neural fibre – and of new synapses.

NGF is released as a result of neural transmission itself. In other words, **by using our brain and nervous system, we grow it.**

When the brain is stimulated by challenge or novel experiences, new connections between neurons are formed, which form permanent neuron pathways, if properly reinforced, like for instance playing chess etc.



George Frederic Handel wrote The Messiah at age 56.

Franz Joseph Haydn wrote the Creation at 67.

Richard Wagner composed the opera Parsifal at age 69.

Giuseppi Verdi wrote the opera Falstaff at age 80.

Nelson Mandela became president of SA at age 74.

*The lesson in all this is therefore: **USE IT OR LOSE IT!***



*We will discuss **neurological stress**, **how the brain switches off and neuroplasticity** in much more detail in Modules 6, 7 and 8.*

Neuro-myths

Neuro-myths are common **misconceptions** about how the **mind** and **brain** function, many of which relate to learning and education. These myths resemble brain facts but are **really fiction**. Once these myths take hold in the public consciousness, it's often difficult for people to separate brain facts from fiction.

Factors to consider before debunking neuro-myths:

- Commitment to science and facts, but EI smart,
- Motive with debunking,
- Expertise knowledge & experience
- Accurate reasoning
- Growth mind-set – curious, creative, optimistic, solutions, possibilities, holistic
- Alternative solution

Below are eight highlights:

- Some are 'left-brained' and some are 'right-brained',
- Brain development has finished by puberty.
- The brain cannot grow new cells.
- Mental capacity is hereditary and cannot be changed by environment or experience.
- We only use 10 percent of our brain.
- When we sleep, the brain shuts down.
- Classical music increases reasoning ability.
- Learning styles





Individual Activity 1

Match definitions on the right with descriptions on the left.

	Neo-cortex	A.	Fatty insulation around neurons
	Temporal Lobe	B.	Visual functions of neo-cortex
	Parietal Lobe	C.	Balance and coordination area of the brain
	Occipital Lobe	D.	Brain area for emotion processing
	Frontal Lobe	E.	A chemical bridge from one neuron to the next
	Neurons	F.	Gears body for fight or flight
	Myelin	G.	Sensory information synthesis and storage
	Axon	H.	Cells that communicate events in and outside the body
	Dendrites	I.	Neo-cortex area where motor functions originate
	Synapse	J.	Area of brain for basic survival and self-defense
	Cerebellum	K.	Hemisphere associated with organization, language and linear functions
	Reptilian Brain	L.	Outer layer of cerebrum where synthesis and major thought processes occur
	Limbic System	M.	Neo-cortex area where sensory functions are received and deciphered
	Corpus Callosum	N.	Relaxed functioning of the body
	Right Hemisphere	O.	Pathway of information from center of neuron to other neurons
	Left Hemisphere	P.	Nerve fibers that connect the right and left hemispheres of the brain
	Motor Cortex	Q.	Hemisphere associated with creativity, movement, intuition and subjective reasoning
	Sensory Cortex	R.	Auditory functions of the neo-cortex
	Sympathetic	S.	Neo-cortex area associated with synthesis of ideas, compassion and altruism
	Parasympathetic	T.	Receptors on neurons receiving information from other neurons



Please complete this activity in your *Workbook*.

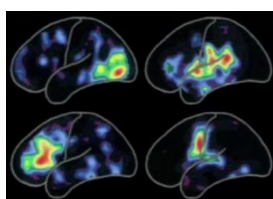
Module 6: How the brain works

The electrochemical functioning of the brain

As previously mentioned in module 5, the brain functions **electrochemically**.

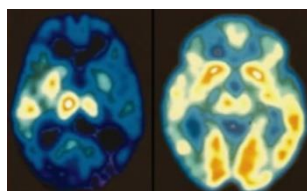
If we look at the picture below, you will see there are 4 images of electrochemical functioning in the brain.

This is how we discover and learn about different brain regions and their functions in terms of learning and thinking. We can see why our brains are important to us when we monitor the electrochemical functioning in our brain.



You will see different spots and different colours in different areas. They illustrate where there is electrochemical activity in the brain.

When we look at the next picture, you see a picture of two brains where the influence of stress on the brain has been monitored. **To stress means to lose control over certain brain regions.** On a visual level, when we start experiencing stress, the electrochemical activity in certain brain areas are being **inhibited** or **shut down**.



In this case, the picture on the right-hand side (where you see the yellow spots) indicates more areas of electrochemical activity. On the left-hand side, there is less electrochemical activity in those areas, which indicates a “switched off” or stressed out brain.

When we look at the image on the right, it shows you that the distribution of electrochemical activity is very balanced. This is a picture of what a relaxed brain looks like.

It is through monitoring this electro chemical activity, that we are learning how the brain works and how can we optimise brain functioning.

So, the question is;

How do we process information electrochemically?

First, let’s start with the electrical part of how the brain naturally works. . .

Positive and negative energy – Mind-sets

Our brain produces between **20 – 25 Watts of electricity**. As you are reading this and learning and processing, your brain is producing energy.



It is important to understand that our brain **produces electricity**, as well as **conducts electricity**. People feel the impact of this electricity as energy that we radiate.

To illustrate this principle:

*When we drop a stone into water, it has a ripple effect. We can compare this to the way energy works. People **produce energy** and they **emanate this energy** into the world. Subconsciously we feel this energy, whether it is **positive or negative energy**.*

Think for a moment – there are many people whose presence we enjoy, because they radiate a lot of positive energy. Being in their presence motivates and inspires us.

We also know that there are people who we tend to avoid because they radiate a lot of negative energy and that negative energy may make us feel bad.

This is the first **learning implication** about how the brain functions that all people must be aware of. The energy we produce, positive or negative, will be experienced by others, which implies that we influence others all the time in either a positive or negative way, without even being consciously aware of the impact we have on them.

So, the question is:

What energy do you take into your home?

What energy do you bring to your work?

What energy do you bring to society?

We don't even have to tell people what the core of that energy will be about. They will be able to **notice it, experience it and feel it**.

If we want to make a constructive difference in this world, we need to be mindful of the impact of the energy we produce on others. When the core of our spirit, our soul - who we are - is positive and constructive, we radiate that positive energy into the world. It rubs off on others. People will enjoy being in our presence and connecting with us.

A positive mind produces positive energy. A negative mind produces negative energy. A negative mind can never produce positive energy. If we are negative, fearful, angry, bitter, or frustrated, without saying a word, others will notice that energy. As light chases away darkness, positive energy chases away negative energy. This is the first difference you and I can choose to make - **when we choose to become positive, constructive beings** ourselves.



View an infographic on our ability to transmit energy by [clicking here](#).



Our chemical state of mind

The next aspect to understand the electrochemical functioning of your brain, is to understand the impact of chemicals that run your brain.

Everything in your body is always about chemicals. There are many chemicals. When we laugh, we feel happy – Why do we feel happy? Because we have produced a chemical called **serotonin** that makes us feel good. Serotonin is the name of the body's happiness chemical.

There are many chemicals, but two categories – “**facilitator**” neurotransmitter chemicals that transmit electrical impulses between neurons and “**inhibiting**” chemicals that slow down and hinder transmission of messages.

Example;

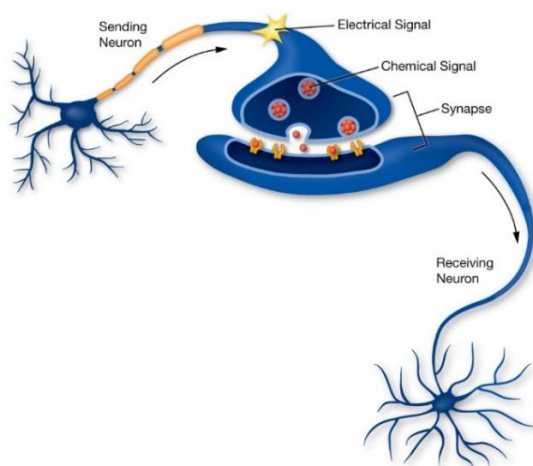
*If you drive down the street and someone runs in front of you . . . you hit the brakes, and the car comes to a standstill. What do you feel? You feel “pins and needles” in your legs the moment the car comes to a standstill. The names of the chemicals that causes the “pins and needles” feeling is, **adrenalin**, **endogenous morphine**, and **cortisol**.*

1. The **adrenaline** normally gives us extra power.
2. **Morphine** is an inhibiting chemical that subdues the pain message, and
3. **Cortisol** is the name of the stress hormone.

These chemicals are **inhibiting chemicals**

Another example;

*If someone got hurt in a serious accident, the person may not feel the pain or less pain for a few minutes to an hour, because the person produced endogenous morphine that subdues or inhibits the pain. The pain is there but the morphine will inhibit and even block the transmission of the pain message. That is why we call it an **inhibitor**. Inhibitors **slow down the speed of electrical transmission**, or sometimes even block it.*



Inhibiting chemicals, slow down the speed of electrochemical transmission between neurons and may even sometimes block it.

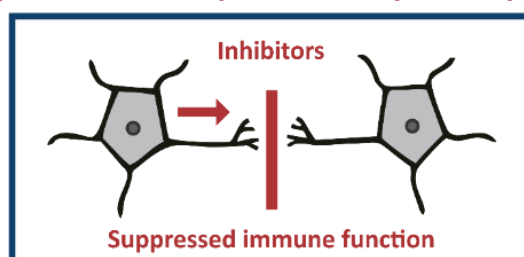
If our state of mind is dominated by inhibiting chemicals, it will negatively impact all thinking, learning and creative processes and we will not be able to flex mental muscle to solve complex problems, be innovative, make smart decisions and think and learn as effectively as we should.

Although it is natural for all human beings to have a negative thought or experience a negative emotion, it is essential to not get stuck there. It is not a problem to have a negative thought or experience, but the continuous secretion of inhibiting chemicals will have a negative impact on our health, wellness, happiness, performance, communication, and social cohesion.

The inhibiting **bio-chemical impact** of being stuck in a negative mind-set like pessimism, will in the medium to long time, **drain our energy** and **weaken our immune system**. It has profound implications for us as individuals, parents, and leaders.

That is why we refer to these inhibiting chemicals constantly being produced over a long period of time, as **bad fuel**. Continuous bad feelings produce bad fuel, which negatively impact our immune system, health, and wellness.

Negative Emotions / Pessimism / Stress / Fear



BAD FUEL!

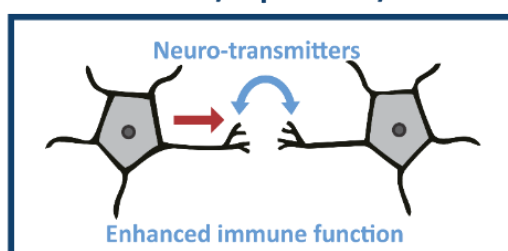
For us as 21st Century workers, and people who want to make a constructive difference and get the most out of our brain, it means we must run on the right fuel.

So, what is the right fuel?

Neurotransmitters which facilitate transmission from one cell to another is considered good fuel.

Positive thoughts and emotions produce chemicals which **conduct** electrical impulses between brain cells, energise us and strengthen the immune system. Continuous good feelings produce good fuel.

Positive Emotions / Optimism / Relaxation



GOOD FUEL!

When these chemicals are the **dominant chemicals** that run our brain and body, we set the stage to create an environment that can facilitate thinking, learning, innovation, and creativity.


Self-management is a trademark of successful people. It cannot start at any other place than becoming accurately aware of the chemicals that run our mind and body and is therefore crucial for us to ensure we run on more good fuel than bad fuel.

This means we need to constantly be aware of the chemical state of our mind and take deliberate actions to **produce more facilitating neurotransmitter** chemicals.

The impact of Lateral Dominance on how people process information

Although left-right brain theory has been oversimplified, it can safely be said that the left hemisphere processes information in an analytical, sequential way, while the right hemisphere processes in a random holistic way. We are using both hemispheres of the brain most of the time, but it can still be said with impunity that at any moment, there will be more activity in one hemisphere than the other.

If you look at the next image, you will see that the two brain hemispheres of the brain have **different (and complimentary) information processing functions**:

LEFT Hemisphere		RIGHT Hemisphere
Logical		Creative
Detail		Holistic
Facts		Emotions
Planning		Impulsive
Structured		Spontaneous
Task-orientated		People-orientated
Learn through language		Learn through pictures
Think “inside of the box”		Think “outside of the box”
Theoretical		Practical
Systematic		Multi-task

It is essential to have an accurate understanding of what the functions of the different brain hemispheres are, so you can understand your own strengths and preferences and optimise your performance by utilising the **whole brain as one functional system**.

Whole-brain thinking and functioning

To explain the importance of “whole brain thinking/functioning”, let’s look at an example:

Your brain works like a movie. A movie has a soundtrack and it has pictures. Without either the soundtrack or the pictures, you won’t make sense of what the movie is about. In fact, you may even make up your own interpretation of the movie, which may or may not have anything to do with the actual storyline of the movie. You need the whole brain!

Just as we have sensory dominance, we also have **hemispheric dominance**. Therefore, when we solve problems, think, communicate, or learn, it is essential to understand how the functions of our dominant hemisphere, will influence how we solve problems, think, communicate and learn and what our strengths will be.



Refer to your NAP™ Advanced+ brain profile. What is your relative lateral dominance preference? How do you think this will influence how you learn, think and solve problems?

The mechanics of how information is processed

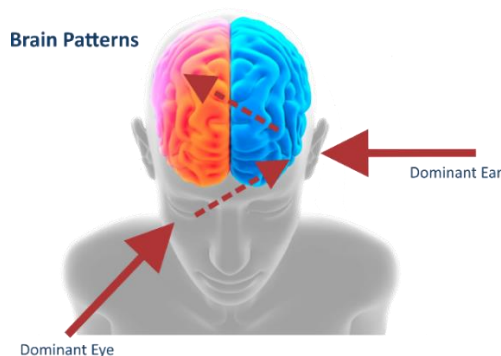
Previously, we looked at how the brain works at its smallest level. If we say that thinking, learning and creativity is going to be our competitive advantage in the future, it is essential for us to have an accurate understanding of how our brain processes information.

It is important to remember that, the **left brain hemisphere** controls the **right side** of the body and vice versa.

People absorb information through constantly taking in **sensory data** as the different nerves send visual, auditory, **olfactory**, **tactile**, and **gustatory** messages to the brain.

More information is **actively processed** through the **dominant senses**, while the **non-dominant** senses follow in a more **passive** manner.

This **sensory dominance pattern** will have a direct impact on how people process information, their performance and risk for error.



Dominance does not mean strongest. It means the brain hemisphere, eye, ear, or hand that leads...that **actively processes information**.

The **non-dominant** hemisphere, eye, or ear, or hand **passively** follows.

It is important to note that all our dominant senses are not necessarily on the same side. Your dominant senses also are **not indicative** of your dominant brain hemisphere.

Even though we have and use both brain hemispheres, one hemisphere will lead, and one will follow.

Incoming sensory information is received in the back of your brain as an **“impress”**.

The information is then processed to the front part of your brain to be **“expressed”**.



Olfactory: relating to the sense of smell.



Tactile: relating to the sense of touch.



Gustatory: concerned with tasting or the sense of taste.



Brain dominance is influenced by your genetic coding. What is your combination of brain hemisphere, eye, ear & hand dominance? (see your NAP™ Advanced+ brain profile)) How do you think your dominance profile influence your risk for error?

Information processing stages

Information processing theory, is a cognitive approach to understanding how the human mind transforms sensory information.

There are many **Information processing theories** and models. Most suggest that the information processing process involves **3 key stages**:

Stage 1: Input/Encoding



The brain is exposed to stimuli, at which point it analyses and evaluates the information.

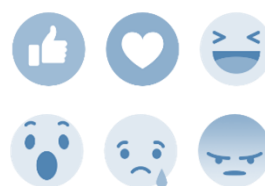
For example; you read this information and determine whether it is worth remembering.

Stage 2: Storage



Your brain stores the information for later use (memory). It also adds it to your **mental schema** and encodes it. **If the information is not reinforced, the brain may simply forget it over time.**

Stage 3: Output/Retrieval



Your brain decides what it is going to do with the information and how it will react to the stimulus. For example; after reading this information, you may choose to use this information you have learned to overcome a challenge.



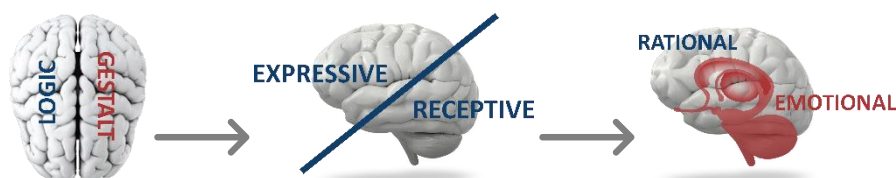
Refer to your NAP™ Advanced+ brain profile. How do you process information? What are your natural sensory preferences?

How you process information through the various stages is useful to remember. It relates directly to your risk for human error, how you learn, and **how we make memories.**

The brain under stress

While it is generally acknowledged that stress profoundly influences the way in which we think and behave, few people understand why this is so.

Recent research shows that the reason for our changed thinking and behaviour under stress is that stress causes parts of the brain to “switch off”.



Flight / Fight / Freeze

Human beings are uniquely designed to be either bilaterally integrated (two-sided) or homolaterally specialised (one-sided). Our species has evolved to be two-sided for most movement skills. Our two-sidedness (for vision, hearing, hand-eye co-ordination and whole-body movement) allows us to compensate with one side when the other side is lost or injured. During stress or times of new learning the non-dominant brain tends to radically decrease its function, leaving the dominant brain to carry on primary functioning. If we rely too much on one side alone, instead of two sides together, we place unnecessary and stressful demands upon our whole system. We call this the “switched-off” state.

The right brain hemisphere controls the left side of the body and the left eye and ear. Likewise, the left-brain hemisphere controls the right side of the body and the right eye and ear. The nerves to the muscles and sensory organs cross over from the controlling brain hemisphere. When one side of the brain is in control, the other side either co-operates and co-ordinates its movements with the controlling hemisphere, or it may “switch off” and block integration.

If over indulgence in activities that cause “switching-off” occur before a person has developed the visual skills necessary to shift back to the three-dimensional vision of everyday living, or if they lull him/her into ignoring his/her depth perception skills, chronic stress may result. Even under such stress, learning continues. Once this “switched-off” pattern is learned, it becomes difficult to “unlearn”. The person becomes stuck in a mode of one-sided response.

The body may experience a number of situations as stressful – a change in attitude, danger, competition or other threatening situations such as the inability to meet a deadline or a sales target, for example. Whatever the perceived threat, the body reacts by secreting adrenaline, cortisol and morphine’s (endo-morphine’s). These primarily increase the body’s chances of survival, as they prepare the body for fight or flight (adrenaline causes more blood to flow to the muscles as a result of an increased heartbeat), as well as protect the body against injury (morphine’s keep the body from feeling pain) response.

Neuron pathways and its impact on our behaviour

To recap what we have previously discussed;

Your brain has 100 billion brain cells. . . and right now, as you are working through this information, your brain cells are growing dendrites (tentacles) that connect with each other, transmitting electrochemical messages from one brain cell to another.

Neuron Pathways (Neuroplasticity)

When you learn, think, and process information, your brain cells connect with other brain cells, forming pathways. When what you learn is sufficiently **repeated and reinforced**, that pathway becomes a permanent neuron pathway. When a neuron pathway becomes permanent, your responses and behaviour become automatic.

Let's look at an analogy:

If you walk on grass, and you continue to walk up and down on the same path a thousand times, you will create a pathway in the grass. When you reinforce what you learn sufficiently, it becomes a permanent pathway in your brain. Developing good skills require great repetition if you want to become a master. Hence the reason why we will repeat important information and principals frequently in this course

So, in summary:

The **left hemisphere** decodes information and processes impulses and experiences into words and assists in developing understanding.

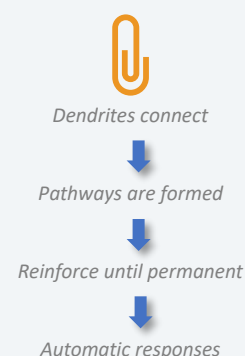
The **right brain** encodes information and makes a map or concrete picture of the words.



The words and pictures are then arranged into a **brain pattern**, called a **neuron pathway**.

If sufficiently reinforced, this neuron pathway becomes a permanent neuron pathway, which is called a **perception** or **attitude** that will automatically influence your responses and behaviour.

The process described above is called neuroplasticity. This is how the brain wires itself and how we learn to become masters at our trade. This process continues until death or stops when we stop using our brain. Remember: "Use it, or lose it"



Attitude will be discussed in more detail in Module 8.

A practical example of this principal is **driving a manual car**.

To learn the skill to drive a manual car is to first start off by studying material (a manual) on how to drive a car and the rules of the road. When you feel that you have sufficiently mastered the information, you write a (learners) test.

Once you have passed this theoretical test, a pathway has been created. You can then physically get into the car and start practicing how to drive it. This practice reinforces the pathway(s) that have been established, and therefore your skills then become an automatic response. You do it now without thinking.

Especially when a person drives a manual car, they do not always have to consciously think about shifting from one gear to the next – this will happen automatically because the pathway has been reinforced sufficiently.

When you go for your practical exam/test, you are tested to see if your behaviour and skills have become second nature/automatic.

If you are doing all the right things automatically, it means that this pathway has now been reinforced in your brain in such a way that you can drive a car without consciously having to think about every single action you are performing.

Reinforcement and the impact on your self-esteem

Your self-esteem is formed in the same way and it is based on the **feedback** (constructive and destructive) we get **from our environment**.

Research tells us that in the western world, children's brains will be bombarded with at least 50 000 negatives before they go to school, which mainly comes from their personal/home environment.

So, if a message has been reinforced 50 000 times, it means that this message has been turned into a permanent pathway. That is why/how so many people grow up with a negative mind-set.

It is therefore very important to understand how easy it is to grow up with a negative/low self-esteem. This is not because we are "bad" people . . . but it very often has to do with the absence of the ingredients needed for a healthy self-esteem (e.g. a loving family environment) as well as the constant bombarding of negative messages from information sources (media, radio, television, books, the people around us, etc.).

These negative messages **influence our self-esteem** tremendously.



A recent survey suggests that the average 21st Century learner in the western world, will experience between 300 – 400 negative experiences in a 6 – 8-hour day at school. This includes feedback from teachers or friends, negative feedback that people give themselves (“I am bad at maths” ...“I can’t do this” ...) or negative experiences such as confrontations and disappointments.

Let’s think about it;

400 negatives per day x 365 days per year. . .

that equates to **146 000** negative messages per year.

This is a massive amount of negative reinforcement that takes place!

The same survey suggests that the average western student watches about 2 ½ hours of television per day. Their brains will be exposed to an average of 58 negatives per hour.

Let’s do the math . . .

*58 negatives per hour x 2 ½ hours per day x 365 days per year, equals **52 925** negative messages received from media, per year.*

So, when adding the negative experiences at home and school, plus the negative experiences received from media, statistics suggest that an average of 8 out of 10 people suffer from low self-esteem, basically because of how we grow up and what we are exposed to.

This highlights the importance of, and need for **positive reinforcement**.

Your thinking controls who you are. You need to think about your thinking. What is the truth about your thinking? Is it mostly positive or negative? Emotionally smart people control their thinking. Their thinking does not control them.

How did school influence you?

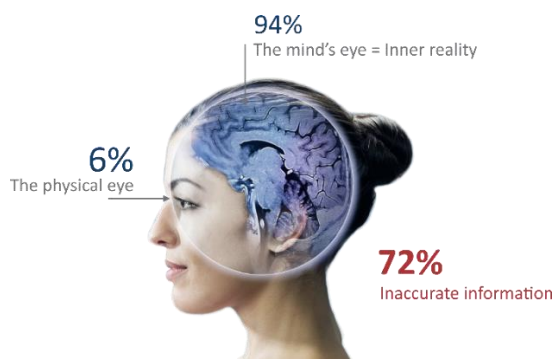
How many hours of TV do you watch per day?



Watch the video on “Jessica’s Daily Affirmation” by [clicking here](#).



Our mind's eye and its impact on our perceptions of the world



This image illustrates, that only **6%** of what we see, we “actually see” with the physical eye.

We need to remember that the eye is the only part of the brain that is visible. Your eyes are the gates through which visual impulses come into the brain. But the neuron pathways in your brain learns to make sense of those visual impulses, and this is how people learn to see.

So, you learn to **see mostly with the brain**, and not with your eyes. The best way to understand this, is for example;

When a baby is newly born, and their eyes are open, that does not mean they are “seeing” – because they don’t yet know what they are looking at.

Another example is when a blind person says, “come here, let me feel what you look like”. Through what they feel with their hands, they create a “picture” and try to make sense of what the person looks like, without physically being able to “see” the person.

With regards to how you process information, impulses come in through the senses, but more through the dominant (leading) senses, and **act as “gates” to your brain**.

This information is filtered through the neuron pathways in your brain (**your mind's eye**) to add meaning to the information.

The **pathways** (both positive and negative) you have established inside your brain, will determine how you **filter, interpret** and **understand** the impulses that come in.

Your self-esteem is one of the lenses that filters the information you receive.

The mind's eye becomes the lens through which you look at your world. If your lens is dark/negative, you will look at your world in a dark/negative way. The same goes for the opposite . . .

In order for you to observe your world accurately, you need to constantly ask yourself;

How do the pathways in my brain and my mind-sets, influence what I see?

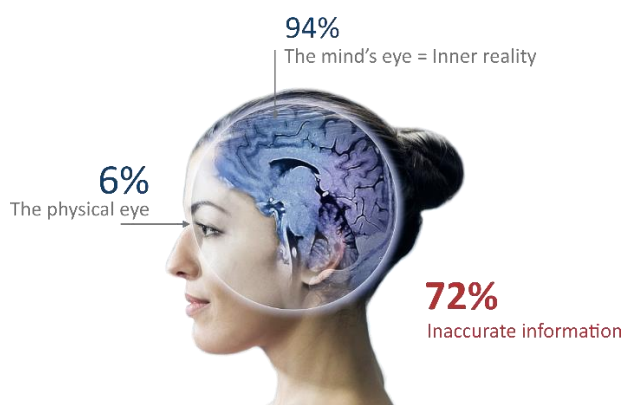


Our mind's eye refers to the pathways we have established in our brain, and this makes up 94% of what we “see”.

People tend to project “their truth” and “their reality” onto the world. That is why, a negative mind-set produces negative perceptions which produces negative behaviour.

A negative mind produces a negative life, the same as a positive mind produces a positive life.

Referring to the illustration again:



Research suggest that $\pm 72\%$ of what the average person believes as a fact or the truth is not necessarily the truth whatsoever.

A lot of information people believe about their world, others, themselves, or how the world and how their brain works, is inaccurate.

If 72% of the software on the body's “computer” is inaccurate, how can people expect to have accurate perceptions and produce accurate responses?

You need to challenge our mind's eye. Ask yourself if the information you expose your brain to is accurate or not, or more specifically;

“Is what I believe aligned with the truth? Is the map inside my brain aligned with the realities of the world outside?”

Your self-perception therefore, has a massive impact on how you view the world and others.

The good news is there is a lot that we can do about it!



To view a powerful video on positive and negative mind-sets, [click here](#).

Think about your thinking. How accurate are your beliefs and the thoughts you maintain about yourself, people and your world? What do you think your percentage of accuracy would be?

Mind-sets – the power of a positive mind

When people change their thinking, and choose to look at the world in constructive ways, they see opportunity, they see solutions. They start looking at themselves for who they really are and who they could be.

“You will never solve a problem with the same type of thinking that created the problem”. – Albert Einstein

Imitative learning is the most powerful form of learning. You look at your world and become what you know. You can’t be what you don’t know! You become what you choose to expose your brain to most and reinforce.

With regards to leadership there is a statement that says, *“You need to lead by example”*. The reason for this is that people will mirror or imitate the examples they see. If the CEO of the company is always late, how can he/she expect his/her employees to be on time? He/she is not leading by example.

“Be the change you want others to be”. - Gandhi

To be that example, you need to start by feeding your brain with positive information and aligning your thoughts with positivity, the truth, constructive people and positive events.

You are **body (flesh), mind (soul), and spirit**.



Your soul (mind) and spirit controls your brain (flesh) – which is your body’s “computer”. Your soul and spirit can determine what “software” you choose to put onto your computer (brain).

So, the analogy is: to have a positive and constructive life, you need to ensure you have **positive software on your computer**.

Think about the three people you spend the most time with. Are they positive or negative? What influence do you think they have on you?

Mind power / mind management principle

Your behaviour reflects your thinking. If you want to change your behaviour, performance and happiness, we must start with changing our thinking by **reprogramming** ourselves.

An important principle here is:

Your thinking determines your whole life. You must take charge of your thinking and steer your thinking towards the outcomes you want to achieve.

True brain power is about thinking about your thinking, understanding how to take **charge of your thinking** and programming yourself accordingly to achieve your goals.

That means, you need to spend more time on your future and your solutions, than on your past or even the now, in order to become the person you want to be.

You cannot always change your circumstances, but you can change how you think about your circumstances.

Nelson Mandela was famous for saying “*I was in jail for 27 years, but my mind was never in jail*”, meaning that although he lived a life with physical constraints, he never allowed an unjust system to steal his optimism, dreams, sense of humour and thinking.

Another example may refer to people living and struggling with cancer. Cancer is a serious illness . . . but how people think about this illness determines how they approach recovery. Many people have survived this illness by thinking the solution (life), rather than the problem (illness).

Am I going to start thinking like a person that is healing and learning what I need to, in order to try and survive this serious challenge in my life, or have I accepted this as too difficult an obstacle to overcome and there is nothing I can do about it?

If the latter is true, we become a victim of our circumstances.

We do not have to be victims of our world, we can be victorious of our world!

Self-management starts with managing your mind, managing your thoughts, and programming yourself to overcome the obstacles you have to overcome ... It means taking charge of your mind and managing your mind towards your future goals.



View the inspirational story of Dick and Ricky Hoyt by [clicking here](#).



Module 7: Learning Implications of Your Neurological Design

Neurophysiological Aspects That Impact Neurological Design & Flexibility

People's neurological design (referred to as neuro-design) is as unique as their fingerprints. It comprises of their specific combination of strengthened neural networks between the dominant senses and various preferred brain regions and intelligence preferences that form a specific blueprint for how they are wired and talented.

Talent is the natural ability that people are born with to excel at doing something that is hard or challenging. It is about how they are gifted. At Neuro-Link we believe that all people are talented, but in different ways. Some may be more talented than others, but everyone has talent(s). The reciprocal and synergistic relationship between the following 7 neurophysiological aspects influence people's unique neurological design and therefor, how they are talented:

- Relative lateral dominance
- Expressive-receptive preference
- Rational-emotional preference
- Figurative thinking and learning languages
- Sensory preferences
- Information processing style
- 11 Intelligence preferences



The interplay between the above mentioned neurophysiological factors form the basis of peoples neuro agility and ability to learn easy, fast and efficiently, that already is and will be people's competitive advantage in the future.

When a person's NAP™ indicate that they are balanced WRT one of the 7 neurophysiological attributes of learning e.g. Balanced WRT left and right brain hemisphere, their neuro flexibility dashboard will indicate a score of somewhere between 80-100%



Neuro flexibility is the balance a person maintains between the two extremes of a particular component of a neurophysiological attribute of thinking and learning. If we are not agile, we alternate between these parts which means we are either the one or the other – analytical or creative - but not the one and the other – analytical and creative.



If we are flexible (integrated) with regards to that component, it means we have a dualistic approach of being the one and the other – analytical and creative. The sum total of being both at the same time, however, is much greater than when people alternate between the extremes of a specific component of learning.

Relative lateral dominance

When trying to understand how people respond to stress and new experiences, how they process information, and which mode of thinking (critical-creative), learning (verbal – visual) and communication (verbal – non-verbal) they will be more comfortable with, the most appropriate point of departure will be to start with understanding their natural lateral preferences.

As mentioned earlier, prevailing research in neuroscience avoids the definite left-right brain labels as some have oversimplified the conclusions of Sperry's discovery of the differences of left- and right brain hemisphere learning, thinking and processing functions. Scientists now use the term "relative lateralization" as much of Roger Sperry's original work remains valid today. Relative lateral dominance refers to how the specific processing functions of a person's preferred lateral mode of performance (the left and/or right brain hemispheres depending on the level of homolaterality or bilaterality), influence how they mostly, but not only prefer to process information, think and learn.

Each of the hemispheres of the brain has prescribed functions or specialties which play a role in determining how we process information, learn, think and act. It can still safely be said that the left hemisphere processes information in a linear, analytical, sequential way, while the right hemisphere processes in a random, holistic way. The brain works like a movie. The left brain hemisphere is responsible for the soundtrack (mainly, but not only). The right brain hemisphere is responsible for the visuals (mainly, but not only). Although people use both brain hemispheres most of the time, it can also be said with impunity that at any moment, there will be more activity in one hemisphere than the other.

In this manner the brain hemispheres avoid duplication of functions and complement each other. We will always experience a combination of right and left hemisphere functions in everything we do. There is, however, a natural tendency for one hemisphere to lead and be dominant.

The best way to illustrate how the brain hemispheres function, is to remind you of how the eyes function when processing information. The eyes are the only part of the brain that is visible. If a person looks through a hole they made with their hands at an object with both eyes, one eye leads (focuses), while the other follows. The dominant eye will be aligned with the hole the person made with their hands. This clearly illustrates that although the person looks at the object with both eyes, the dominant eye will actively process information while the non-dominant eye follows more passively.



Gestalt: to conceptualise or form a picture.

Similarly, a person will use both brain hemispheres when learning or thinking, but one hemisphere will take the lead to process information actively and one hemisphere will follow, processing information more passively, even if both brain hemispheres are functioning equally (100%), when executing a specific function like solving a problem. This implies we all use the whole brain when solving problems, but our point of departure in how we do it, will be different. Left hemisphere dominant people will prefer to start solving problems by starting to analyse the facts and gather detail first and then conceptualize the data into a meaningful picture. Right hemisphere dominant people will first prefer to conceptualize a picture of the problem and then back track into the details and facts.

All people learn, think and are creative, but their point of departure in doing it will differ. When learning, we need to learn through words and pictures, instructions and illustrations. Even if we learn through pictures and instructions, illustrations and words, some will need to start with language, words, instructions and verbal explanations, while others will need to start with pictures, illustrations and demonstrations first.

The hemisphere that naturally leads, will also impact how people learn and think when experiencing stress or fatigue significantly. A person's relative lateral dominance will determine which brain hemisphere becomes less receptive ("switches off") during stress, and which hemisphere will lead.

Also, whether people are homolateral or bilateral (their level of hemispheric integration) will influence their learning ease, speed and flexibility. If a person is still homolateral, that person may be more visual or language orientated, learning slower, harder and experiencing more difficulty with learning. If the person is bilateral, the person will experience more ease, learning faster and smarter as the person will be visual and sound, words and pictures, instructions and illustrations oriented. Neuro agility requires bilateral functioning. Developing talent and improving performance cannot start at a more fundamental place than learning how to utilize both brain hemispheres simultaneously as one integrated system.



Left Hemisphere vs. Right Hemisphere Dominance

Language centres for most people, mainly (but not only) reside in the **left-brain hemisphere**.

Therefore, left-brain dominant thinkers and learners, are people who will **start** with language when they think and when they learn. They therefore prefer to talk, debate, argue and discuss to make sense of information.

A left hemisphere dominant person is normally an “analytical” thinker.

The **right hemisphere** is also called the **gestalt** brain hemisphere. It helps you to conceptualise (see) the **“big picture”**.

A right hemisphere dominant person is normally a “big picture” thinker.

They prefer pictures, illustrations, and demonstrations, to think, and learn. They often ask, **“show me”**, whereas the left hemisphere dominant person may ask **“tell me”**.

Can you see that as “whole-brain people” we need to be “show me” and “tell me” people, or “tell me” and “show me” people, depending on your lateral dominance? Even if we are both (balanced), one hemisphere will lead. It is therefore essential for you to understand with which hemisphere you **lead**.

In terms of learning, left hemisphere dominant people will prefer to start learning through language and then go to pictures. Right hemisphere dominant people will start learning through pictures and then go to the language.

If we are **“brain-fit”** we will use both. Even if we use both, one hemisphere will lead.

The **left hemisphere** is also known as the **analytical** brain hemisphere. This means that this part of the brain breaks information down into the smallest bits of meaningful information. They are therefore detail oriented people.

Left hemisphere dominant people are frequently referred to as **analytical thinkers**. They prefer to analyse facts, gather information, and research data to make sense of things.

Left hemisphere thinkers are logical thinkers who typically think **“inside the box”** and enjoy rules, structure, sequence, and order.



Gestalt: to conceptualise or form a picture.

Right hemisphere dominant people are frequently referred to as “big picture” thinkers. They are holistic and need to conceptualise information - create a picture. Once they have made sense of the bigger picture, they will go to the detail.

We all learn, think, and create, but in different ways because our point of departure in thinking and learning is different.

Right hemisphere thinkers are usually creative, “**outside of the box**” thinkers who enjoy finding innovative ways to think faster and smarter, breaking new ground and challenging the “**status quo**”.



You need to be a “**whole-brained**” person. There are times when you must think inside the box, follow rules and regulations, sequences, and structure. But there are also times when you should think freely, be innovative, creative and come up with new ideas to work faster and smarter and do things differently.

Whole-brain functioning is the key to optimized performance, but you should also remain accurately aware of where you “start”, as this will dominate your thinking, communication and learning processes and determine your natural strengths and how you are talented.

Different people make sense of the world in different ways. Our mind's eye (perceptions that determine how we see, understand, and respond to the world) is naturally shaped differently by our unique combinations of brain hemisphere and sensory dominance, intelligence preferences and information processing styles!

Left / Right Brain Hemisphere Characteristics

Left Brain (Logical / Analytical)	Right Brain (Gestalt / Creative)
1. Logical – Analysis	1. Intuitive – Estimates
2. Planned and structured	3. Fluent and spontaneous
4. Sequential thinking	5. Simultaneous thinking
6. Works with numbers, formulas, lists, data, facts	7. Remembers faces, pictures, postures, voices
8. Language oriented	9. Feeling- and experience-oriented
10. Prefers talking and writing	11. Prefers drawing and manipulation
12. Prefers multiple choice tests	13. Prefers open-ended questions
14. Discerns sharp perceptual and conceptual boundaries – black or white	15. Identifies boundary perceptions – grey areas
16. Distinguishes between right and wrong	17. Flexible, more tolerant
18. Identifies differences	19. Looks at similarities
20. Future oriented, time -conscious	21. Present-time oriented, less time-conscious
22. ‘Make it happen’ attitude	23. ‘Let it happen’ attitude
24. Needs structure	25. Essentially self-acting
26. Controls feelings	27. Free with feelings
28. Prefers hierarchical (ranked) authority – autocratic	29. Prefers participative authority – democratic



Whole-Brain Teaching & Learning Considerations

Left Brain Hemisphere	
Learns through:	Learners Respond to:
<ul style="list-style-type: none"> • Acquiring and quantifying facts • Applying analysis and logic • Thinking through ideas • Building cases • Forming theories • Organizing and structuring content • Sequencing content • Evaluating and testing theories • Acquiring skills through practice • Implementing course content • Laws and principles • Language and words – ‘Tell me’ 	<ul style="list-style-type: none"> • Formalized lectures • Academic environment • Auditory learning • Fact-based content (lists, etc.) • Text books • Structure • Facts and figures • Financial / technical discussions • Step-by-step learning • Thorough planning • Sequential order • Organizational / administrative case discussions • Judgment based on past experience

Right Brain Hemisphere	
Learns through:	Learners Respond to:
<ul style="list-style-type: none"> • Taking initiative • Exploring hidden possibilities • Relying on intuition • Self-discovery • Constructing concepts • Synthesizing content • Listening to and sharing ideas • Integrated experiences with self and others • Moving and feeling • Harmonizing with the content • Emotional involvement • Pictures, illustrations, demonstrations – ‘Show me’ 	<ul style="list-style-type: none"> • Spontaneity: Free flow • Holistic concepts • Experimental opportunities • Poetry and fantasy • Playfulness • Aesthetics • Future-oriented case discussions • Visual displays • Individuality • Being involved • Sensory movement • Music • People-oriented case discussions • Group interaction

Remember:

Left brain hemisphere:

Functions: words, language, instructions, detail

Learning implications and preferences

Right brain hemisphere:

Functions: pictures, illustrations, demonstrations, holistic

Learning implications and preferences

Whole-brain integration:

Consider the impact of the level of whole-brained learning and thinking homolaterality or bilaterality

Expressive / Receptive Preference



Regardless of relative lateral hemispheric dominance, people's thinking, learning, communication and personality is also influenced by either being more expressive or receptive. Although people use all lobes of the neocortex, there will be more activity in some lobes than others, depending on the lobe(s) that lead when processing information. Expressive and/or receptive preference refers to people's preferred mode for being more expressive, using the language centres in the frontal lobes of the neocortex or more receptive, using the sensory lobes when learning and thinking

Information processing during the learning process can be viewed as an input-output model. The frontal lobes and the sensory cortex of the brain also has prescribed functions or specialties which play a role in determining how we process information, learn, think and act. Information enters through the senses as an input in the sensory lobes in the back of the brain. The receptive mode is typified by absorbing information through the senses and reflecting upon that information in an abstract, quiet manner.

Information is then processed to the expressive centers of the brain in the frontal lobes. The expressive mode is typified by expressing thoughts and feelings verbally. People who focus more electrochemical activity to the frontal lobes tend to be more expressive and verbal. The characteristics of the expressive and receptive modes are as important to establishing a person's mental preferences when learning, thinking and communicating, as the differences between the left and right brain hemispheres.

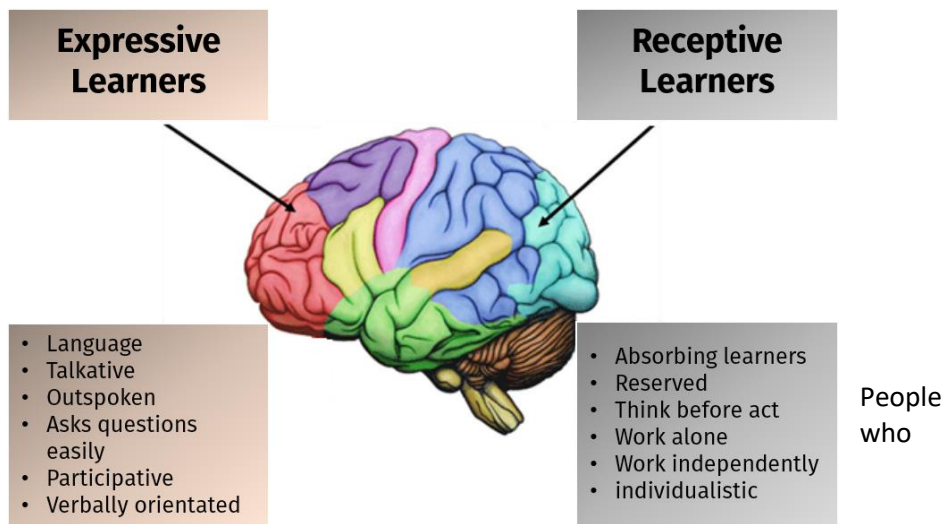
Neuro agility requires people to have the mental flexibility to be expressive and receptive, depending on what response is required in the specific situation.

Therefore:

People who focus activity more to the **frontal lobes** tend to be **more expressive**. The expressive person is more verbally oriented and spontaneously expresses themselves through language and emotions. They usually enjoy talking and taking part in discussions.

People who focus activity more to the **back of the brain** tend to be more **receptive**. Receptive people appear to be more reserved and absorb information, thinking about it before saying anything. They observe rather than participate, therefore usually enjoying functioning independently rather than in a group.

During times of stress, the characteristics are dominant and sometimes even exaggerated, so people who focus activity in their frontal lobes will typically start to talk more and louder, whilst people who focus activity in the back of the brain may stop talking altogether.

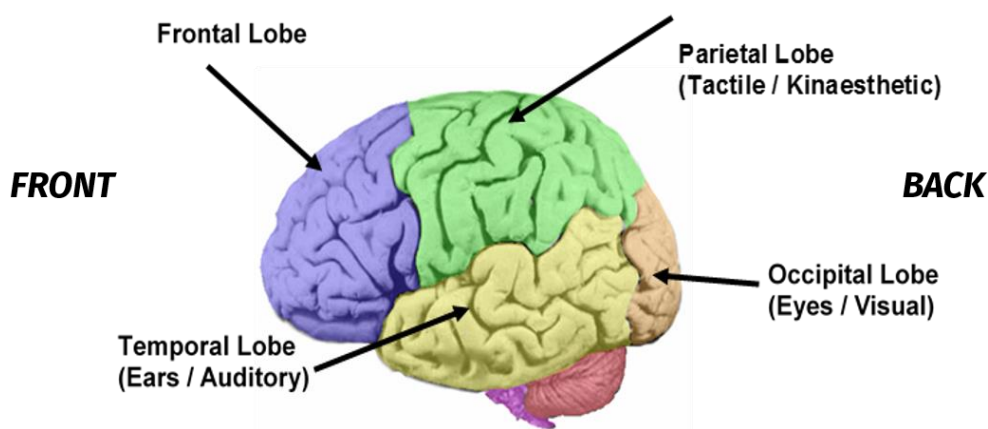


The receptive back brain is necessary when we need to process information in recognizable 'chunks' where no analysis or linear, sequential operation is necessary. The receptive brain receives information passively, without judgment or sense of limitation. It contains our connection with our bodies, nature, and our surroundings. The back brain consists of the parietal, occipital and temporal lobes that receive information from the five senses.

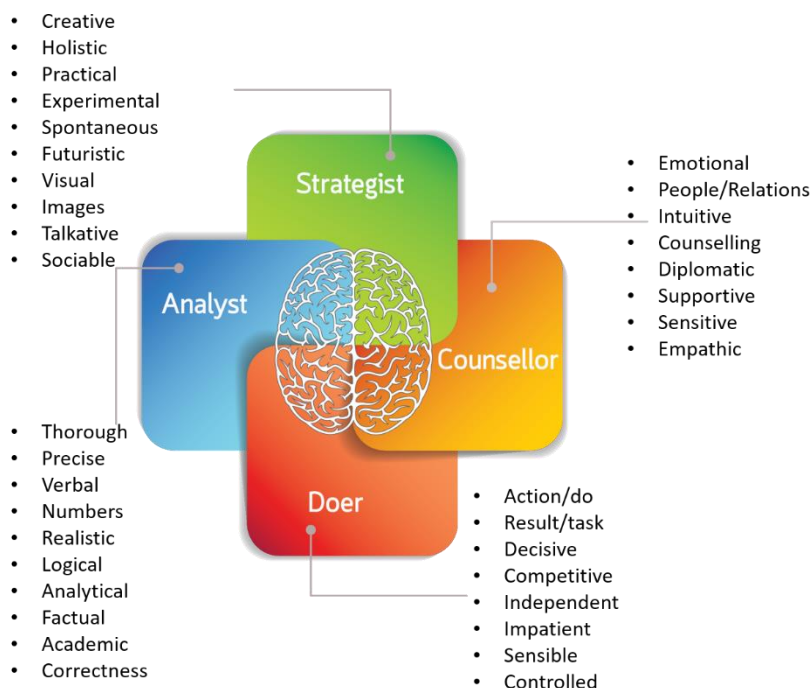
become more aggressive during stress are in **FIGHT mode**.
 People who just want to jump up and walk away are in **FLIGHT mode**, and
 People who shut down and become very quiet, are in **FREEZE mode**.

The Eight Lobes

The lateral hemispheres are the centers of reasoning and integration. This Neo-mammalian brain, also called the Neo-cortex, equals 80% of the total brain matter and is where the nerve net occurs. These two hemispheres each consists of four major lobes:



The Four Brain Quadrants



Regardless of relative left or right brain hemisphere preferences and expressive-receptive preferences, people will always experience a combination of all these functions in everything they do, if they do not experience too much stress and/or fatigue.

Amongst others, a person's neuro-design consist of the unique inter-relationship between relative lateral dominance (left-right hemisphere) and expressive-receptive (front-back) preference in the cerebral cortex.

The interplay between these brain regions in the cerebral cortex creates uniquely strengthened pathways that lead to 4 different modes (4 quadrants) of how people prefer to think, learn and communicate. Although people can talk all 4 figurative languages, they would naturally prefer to start with their dominant mode and then follow a specific sequence in speaking the other figurative languages when solving problems, thinking, learning and communication. Understanding how people prefer to utilize the figurative learning and thinking languages of the neocortex in normal everyday situations provide powerful insights about their neuro agility, the specific contributions they make in teams, the roles they play and how they communicate, learn and think.

Neuro agility would dictate that people need to have the cognitive flexibility to adapt to, and speak other people's figurative learning and thinking languages.

The Four Quadrants Explained

Doers

Doers are task-orientated people. They focus on getting the job done. Doers need not be double-checked. Another word for them is completer-finishers. In general they get immediate results and show a strong sense of perseverance. They invite and accept challenges. Doers tend to talk in bold letters; meaning that their requests might sound like a command/instruction. They have the ability to make quick decisions, are problem solvers, hardworking and self-sustaining.

Doers should be mindful of the following:

Doers might come across as insensitive towards other people. They make decisions quickly and therefore tend to not give as much attention to risks and dangers within certain situations/scenarios. Because they are hard workers, they tend to take too much work on themselves. They dislike it if they are limited. They may be impatient at times because they are working towards quick results. At times they could display characteristics of inflexibility and unyieldingness. They may also sometimes expect too much from other people.

Analysts

Analysts are analytical thinkers, being detail-oriented people. In general they are very neat, thorough and disciplined. They come over as extremely competent, precise and show diplomacy when dealing and interacting with people. Also, they are extremely dedicated to quality in terms of their work and general approach towards life.

Analysts should be mindful of the following:

Analysts could at times be indecisive and too inflexible with regards to method of doing or implementing. They often lack spontaneity and might distrust other people. They can easily get stuck in too much detail. They could come across as pessimistic, fault finding and avoid conflict.

Counsellors

Counsellors are very supportive, loyal, stable, predictable and reliable. They are agreeable, service oriented and in general appear to be good listeners. People feel safe around them. They are guardians of relationships.

Counsellors should be mindful of the following:

Counsellors often resist change and can be too lenient. They are often indecisive and possessive, especially in terms of relationships. They may experience difficulty to reach deadlines and tend to procrastinate and postpone tasks and also avoid conflict. In general they have many good ideas, but don't take initiative to implement them.

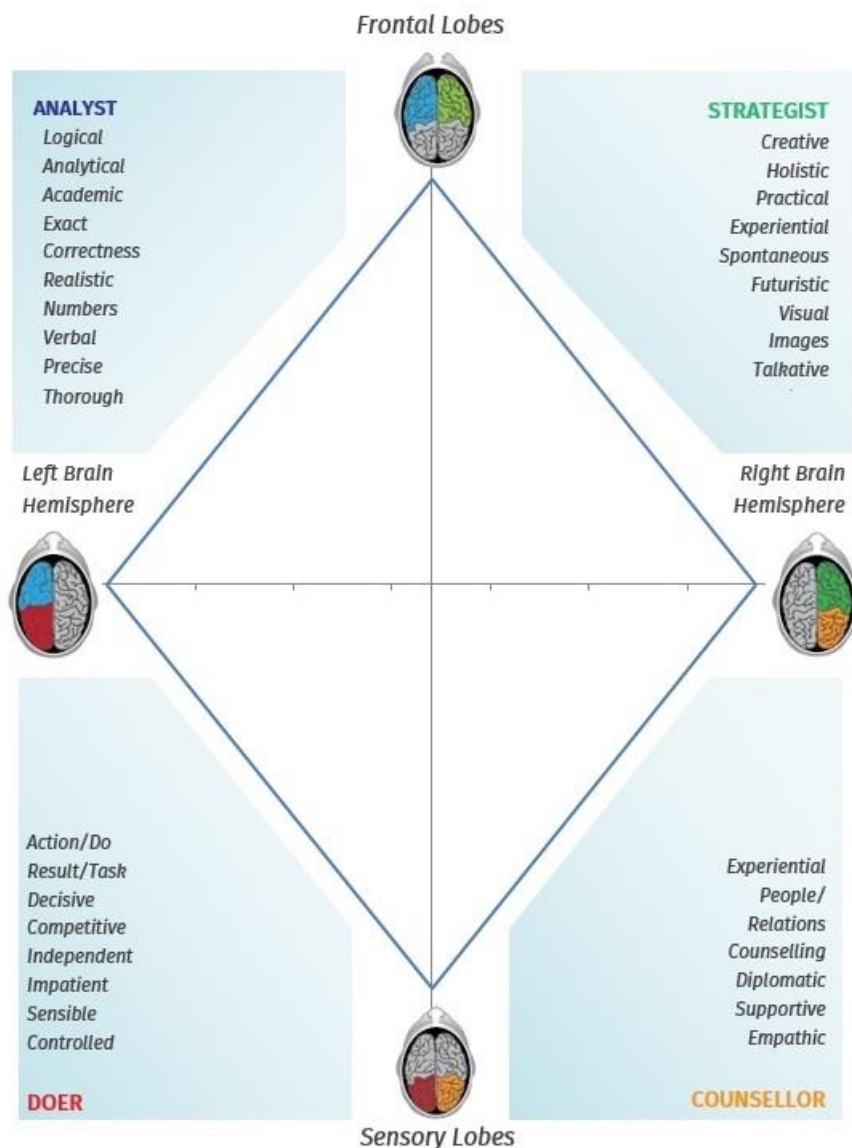
Strategists

Strategists are the conveyers of dreams and possibilities. They push boundaries. In general they are optimistic, people oriented and easy communicators. They usually create a pleasant atmosphere and are enthusiastic about life and people. They make a good impression, are convincing and are friendly and outgoing.



Strategists should be mindful of:

Strategists sometimes lack the ability to execute on ideas and tasks. They may tend to overestimate their abilities and be impulsive. They may also find it hard to say no and by doing so, take on too much. They also have a tendency to be overoptimistic about end results and to over talk the Issue. Strategists jump to conclusions too quickly and may also sometimes tend to be manipulative.



Rational / Emotional Preference



Some people are naturally more emotionally sensitive. Others are more rational. Some are more academic learners and others more experiential. People's preferred mode of performance (the cerebral cortex and/or limbic system) influence how they think and learn.

Some people prefer to focus more electrochemical activity in the cerebral areas (**outside layer**) of the brain, while others prefer to focus more electrochemical activity to the limbic system (**deeper inside areas**) of the brain.

The cerebral mode is typified by cognitive, intellectual and rational ways of thinking. The limbic mode represents emotional – “just feel” – ways of knowing.

Being able to easily fluctuate between rational and emotional, academic or experiential modes of learning, will significantly improve people's neuro agility.

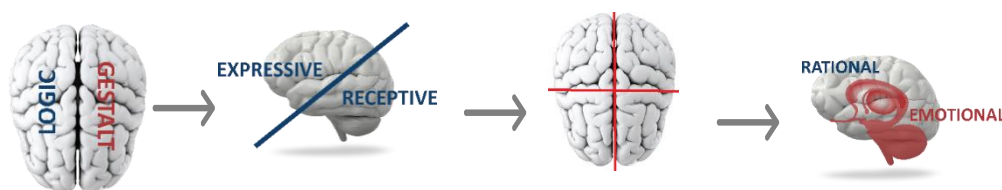
The characteristics of the cerebral and limbic modes are just as important in establishing a person's distributions of mental preferences, as what the differences between the left and right modes are.

Therefore:

People who focus more activity to the outside layer of the brain tend to be more rational, **thinking things through before reacting**. Rational thought will usually dominate their emotions. They are often perceived as thinkers and philosophers.

People who focus more activity to the limbic system (also known as the midbrain) tend to be more **emotional, spontaneously reacting and expressing** what they feel or experience. Often their emotions may dominate rational thought.

For people to be learning agile, they need to have **three-dimensional cognitive flexibility** to easily fluctuate between the brain hemispheres (left-right), expressive-receptive brain regions (front-back) and emotional – rational (top-bottom) brain regions as illustrated below:



Remember:

Top brain (Rational): Functions: task-oriented, objective, reasoning, thinker, controls emotions.

Bottom brain (Emotional): Functions: people oriented, emotional, subjective, feeler, express emotions.

Information Processing and Sensory Preference

The information processing style indicates your unique genetic brain and sensory dominance pattern. People process information by what they see, hear, smell, taste and touch. We have two brain hemispheres, two eyes, two ears and two hands, but we will always have a dominant brain hemisphere, eye, ear and hand.

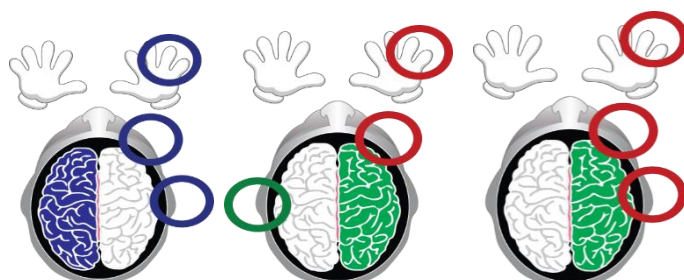
Dominance indicates which brain hemisphere, eye ear or hand takes the leading role to process information actively. The other brain hemisphere, eye, ear or hand follows more passively. This implies that different people have different combinations of the dominant brain hemisphere, eye, ear and hand and will therefore learn and process information differently.

Each brain hemisphere and the senses has specific processing functions. In this way each hemisphere and senses avoids duplication of functions and complements each other. In a natural, relaxed state you will usually experience balance between all functions. There is however, a natural tendency for one hemisphere, eye, ear and hand to lead.

This dominance pattern will affect how you respond, especially during stress and in new learning situations. It will have an influence on your personality and how you learn, think and communicate. Everyone has a unique information processing style.

Furthermore, there are at least sixteen different combinations of brain hemisphere, eye, ear, and hand dominance that cause people to process information differently when learning and thinking, especially during stress and when fatigued. It becomes their blueprint for learning, thinking and how they behave.

People's unique dominance pattern will determine whether they have access through their dominant senses to their dominant brain hemisphere during stress, or not. If their dominant senses are on the same side as their dominant brain hemisphere during stress, fatigue, or lack of brain fitness, they may experience a neurological hindrance that inhibits electrical transmission between the senses and the hemispheres that may result in human error. When the dominant senses are opposite the dominant brain hemisphere, there will be no neurological hindrance during stress, which will reduce the person's risk for error. Added to the unique processing style of each person, is the influence of the processing preferences of each hemisphere on the specific senses it controls as well as the person's emphasis on, and sensory preference for visual, auditory, and kinaesthetic learning.



Senses: People process information through what they see, hear, smell, taste and touch. We have two brain hemispheres, two eyes, two ears and two hands, but we will always have a dominant brain hemisphere, eye, ear and hand that will actively process information.



Opposites: The left brain hemisphere controls the right side of the body and the right brain hemisphere controls the left side of the body, regardless of the location of the dominant senses



Neurological Hindrance: When people are homolateral (one sided and therefore less brain fit), or experience stress, the dominant senses opposite the dominant hemisphere will be adept at processing information. If the dominant senses are on the same side as the dominant brain hemisphere, your information processing ability may be inhibited and sensory processing functions may become limited during stress, which causes a neurological hindrance



Dominance: Dominance indicates which brain hemisphere, eye, ear or hand takes the leading role to process information actively.

During Stress:

Left-brain-dominant people focus more on details, analyze situations and have a strong need for understanding every little detail or aspect of the situation. They also need to verbalize and formulate thoughts through talking or writing. Stressed logic-oriented learners are without joy, appearing tense and insensitive towards people. Their movements tend to be mechanical.

Right-brain-dominant people focus more on the big picture and experience the emotions of a situation. Language is not an initial response. These people might feel a strong need to physically move or express emotions. Stressed gestalt-oriented learners act without thinking, appear too emotional and have difficulty expressing them and remembering details.

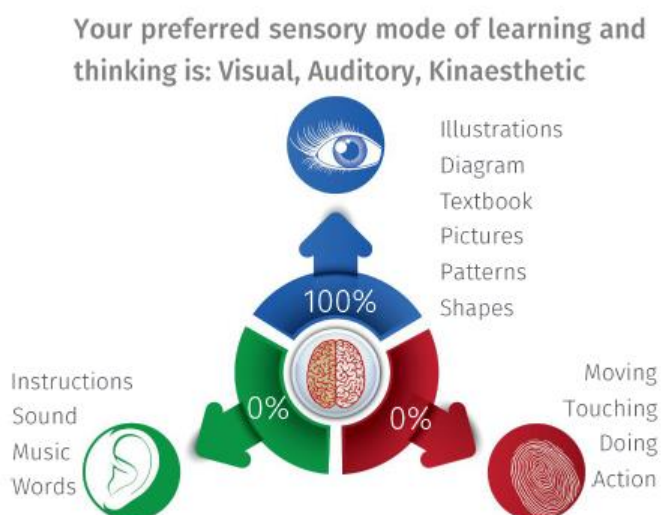


Stress = Cortisol release from the adrenal glands.

Sensory Preference

How a person's preferred sensory mode of performance (visual, auditory, kinaesthetic) influence how they think and learn.

Regardless of your information processing style and if you have access through your dominant senses to your dominant brain hemisphere or not, your brain uses three symbolic languages during thinking, learning and creating. These symbolic languages are Visual, Kinesthetic and Auditory. Our profile indicates the value each person place on each of these sensory modes of learning, thinking and creating.



The Dominant Eye

If the dominant eye is opposite the dominant brain hemisphere, the person is regarded as a visual learner, because he/she will actively process information through that eye to the opposite brain hemisphere, even during stress and 'switched off' conditions.

People who assimilate information visually tend to speak quickly but inaccurately. Their brain visualizes everything at a faster pace than they can articulate. Consequently, they often fail to find the most appropriate words, even though they know what they want to say. They tend to use phrases such as, 'I see what you mean', or 'I get the picture'. They often enjoy drawing and watching television and films.

General strengths of visual learners

They tend to:

- Be effective organizers
- Be conscientious about their personal environment
- Not be distracted by noise or a busy office
- Like sitting where they can see what is going on
- Remember faces better than names
- Close the eyes and visualize what they hear
- Work neatly
- Find something else to look at, when bored
- Benefit from the use of large pictures, posters and models

General hindrances of a visual learner

They may tend to:

- Easily lose concentration in meetings or training situations
- Struggle with information that has not been written down or that they cannot see

What visual learners should do?

- Make notes using diagrams, flow charts and bullet points
- Try to read new information rather than listen to it
- Create mental pictures to aid memory
- Approach all verbal presentations with extra concentration

Gestalt eye (left eye)

The experience of the visual/ gestalt eye is shaped by the gestalt brain hemisphere. This is the **far-sighted** eye, always seeking out the distant horizon, the **movement**, and the bigger picture. It is activated by **color**, tone, shape, and "feeling" or mood. The left/gestalt eye seeks **emotive** contact. It receives the visual experience, welcoming the varieties of **shape** and **shade** without any need to analyze.



Consider the influence of the dominant eye on personality.

Consider the influence of the dominant eye on learning preferences and information processing.



This eye sees the vivid and uncontrolled images of a dream or the spontaneous visualization. It seeks some visual order and fluidity. The left/gestalt eye prefers to track from right to left; therefore people who are left eye dominant often experience difficulty with reading a language written from **left to right**. Letter reversals often appear. A person who is left/gestalt eye dominant will prefer video's, photographs and diagrams to books, words and numbers.

Logic eye (right eye)

The analytic eye is the right eye which is the **close focus** eye. Its visual choices are monitored by the language/analytic brain hemisphere. This eye seeks out the smaller **details** and **near-point** activities. Reading, writing, simple math, and other linear, **sequential** activities are the preferred modes of processing. This eye works well with the hand for near-point tasks. This eye likes to draw and use tools, cut and paste, copy and analyze form. This eye is intrigued by line, static objects, symmetry and systems. The abilities of this eye and the associated brain hemisphere give us visual acuity. Organization tends to be confined to small, immediate spaces. The right language/analytic eye prefers to track from **left to right**, therefore this eye is often referred to as the reading eye. People who are right language/analytic eye dominant usually experience more ease with reading.

Suggestions to accommodate visual learners

- Use graphic organizers
- Incorporate overheads and Power Point slides into lectures and presentations
- Provide hand-outs to accompany lectures and presentations so students can read along
- Show maps
- Teach through visual imagery
- Use graphs and charts to represent data
- Show movies and news clips
- Allow students to respond through drawings (with accompanying written description/summary)
- Assign posters and illustrations to accompany presentations and reports
- Provide written copies of speeches, lyrics, poems
- Use color codes



The Dominant Ear

If the dominant ear is opposite the dominant brain hemisphere the person is regarded as an auditory processor of information because he/she will actively process sounds through that ear, even during “switched off” conditions.

Auditory learners are at their best with sounds or the spoken word. They speak at a medium speed, often very eloquently, which makes them excellent mimics or raconteurs. People who learn in this way use phrases such as, “**I hear you,**” or “**clear as a bell,**” and open sentences with the word “**Listen**” They enjoy listening to the radio or to music. When they read, they sometimes move their lips or even say the words aloud, or hear the words in their mind.

General strengths of auditory learners

- Like group discussions
- Remember verbal instructions
- Absorb verbally presented information easily
- Are at their best in a face-to-face or telephone conversation
- Sit where they can hear. Do not always pay attention to what is shown.
- Remember names but tend to forget faces
- May mumble or talk to themselves if bored
- Like the sound of their own voices
- Talk a lot
- Listen to what others say
- Able to concentrate in a noisy environment
- Like listening to music

General hindrances of auditory learners

- May produce written work that is dull and flat
- May experience difficulty in matching colors
- Are poor at visualization
- Need to talk through written instructions
- Are easily distracted

What auditory learners should do?

- Listen carefully to verbal presentations: don't take unnecessary notes
- Ask for verbal explanations of charts
- Dictate any material they want to learn or understand into a recorder, then play it back
- Read complicated instructions or written passages out loud; try to explain them to someone else
- Try to keep noise and other distractions to a minimum

The left ear is the gestalt/tonal ear. It listens to the emotions, rhythms, sounds and HOW things are said. The right ear is the analytic / language / logic ear. It listens to



Consider the influence of the dominant ear on personality.

Consider the influence of the dominant ear on learning preferences and information processing.



words, human speech and **WHAT** is being said. Each hemisphere crosses over to the opposite ear, but each ear has access to both hemispheres through integration.

Tonal / gestalt ear (left ear)

The left ear is the gestalt/tonal ear. The right/gestalt hemisphere controls this ear irrespective of dominance. The right/gestalt/tonal ear listens to **emotions, rhythms, sounds** and **HOW** things are said. People with this ear dominance often become musicians or therapists, listening in-between the lines etc.

Language / analytical ear (right ear)

The right ear is the language/analytical/logic ear. The left/logic brain hemisphere controls this ear irrespective of dominance. It listens to **words, human speech, details**, the **lyrics of Music** and **WHAT** is being said. This ear breaks sounds down into small pieces. People who are right ear dominant often do well in academic learning situations where they have to listen to language and details.

Suggestions to accommodate auditory learners in your class / lecture room

- Lecture
- Read aloud
- Focus on phonics
- Lead discussions
- Allow small-group discussions
- Hold sharing sessions at the end of lessons (students share verbally what they accomplished during a work session)
- Hold debates
- Assign oral presentations
- Assign recitations (poetry, speeches)
- Play music related to theme
- Listen for beats and rhythms
- Play recordings of speeches
- Let students teach each other in pairs



The Dominant Hand

In the learning situation, the hand people write with is regarded as the “dominant” hand. If the writing hand is opposite the dominant brain hemisphere the person will have access through that hand to the dominant brain even during stress.

They are often referred to as Haptic or Kinesthetic learners. Kinesthetic learners, learn best when they are involved, moving, experiencing and experimenting.

People who learn kinesthetically are physically oriented in every way: they enjoy physical contact, communicate with gestures, and often stand close to other people when they are talking to them.

Kinesthetic learners speak slowly and deliberately and use phrases such as, “This feels right for me.” They may use a guide when they are reading – a finger or perhaps a bookmark placed under each line of text.

General strengths of kinaesthetic learners

- Prefer action to words
- Learn by doing
- Have a good idea of what they can and cannot do
- Respond positively to physical rewards
- Often choose a place where they have space to move around, eg. on the fringe of the group
- Find it difficult to repeat what they have heard
- Need to be active at all times
- Many short breaks are recommended
- Use hand movements and gestures while talking
- Fidget with anything at hand when bored
- Move around a great deal
- Need active participation for effective learning
- Restless in class if they have to sit and listen or watch
- Often need much attention and affection

General hindrances of kinesthetic learners

- Can sometimes become restless, and unnecessarily involved in a problem
- May get lost, both physically and mentally, when attempting unfamiliar tasks

What kinesthetic learners should do?

- Act out new scenarios before the real event
- Make notes in text margins
- Seek practical demonstrations
- Avoid sitting still when they are studying



Consider the influence of the dominant hand on personality.

Consider the influence of the dominant hand on learning preferences and information processing.



Fine-motor oriented, verbal kinesthetic hand

A person who is left/language brain dominant and right handed is fine motor oriented and is considered a verbal or **communication** learner. This person usually expresses him / herself very well through verbal and/or written communication. Such a person is usually good with talking and/or writing and **fine motor** activities like writing and **using tools** with intention.

If a person is right hand and right brain dominant, this person's verbal expression will be limited during stress.

Gross-motor oriented, non-verbal kinesthetic hand

The person who is right/gestalt brain dominant and left handed is regarded as a non-verbal learner. This person usually expresses him/herself through non-verbal gestures, emotions and facial expression. Such a person is an experiential learner and needs to move around more. They are good at **gross motor** activities like catching a ball etc. If a person is left hand and left brain dominant, this person's expressions with hand and body gestures will be limited.

Suggestions to accommodate tactile – kinesthetic learners in the class / lecture room

- Allow students to role-play
- Assign performances of poems, speeches, songs
- Provide manipulative whenever possible, not only in math
- Get in touch with feelings and gut reactions
- Bring in artefacts (such as fossils, clothing related to historical period, etc.)
- Offer foods related to theme (depending on age, students can prepare and bring in)
- Assign models and dioramas to accompany presentations and reports
- Assign plays for students to perform or read aloud (Readers Theater)
- Schedule field trips
- Teach note-taking strategies
- Incorporate dance
- Take pictures to illustrate projects



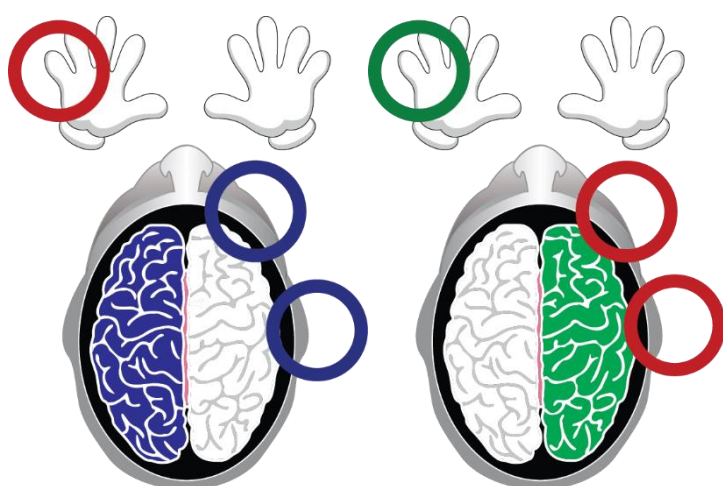
Information Processing & Dominance Categories

Mixed Dominance

Over fifty percent of the learning-disabled population falls into the mixed-dominance category. This dominance pattern may lead to confusion and disorganization, especially in the homolateral state and when it comes to fine motor skills. People with a mixed-dominance pattern have the dominant hand on one side of the body and the dominant eye and/or ear on the other side. The hemisphere which is 'on' for the hand is not the one that is 'on' for the eye.

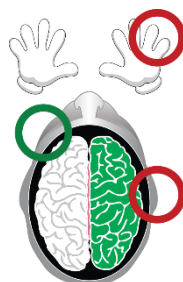
This is especially difficult when people are left-eye-dominant and right-handed. In order to read from left to right, they compensate by 'switching off' the dominant eye in order to lead with the right eye. Visual memory and gestalt skills may therefore not be available to the learner.

Directionality and perceptual problems most often develop when there is mixed dominance. This confusion often results from an inner confusion in the homolateral state, between the dominant hand controlled by one hemisphere and the dominant eye and ear controlled by the other.



Case Study: Jack - Mixed Dominant

Jack is a management executive, age 46, who wants to improve his slow reading skills. He explains that he has never really enjoyed reading as it is such a struggle for him. His dominance pattern is right-gestalt brain dominant, right-handed, left-eyed, and right-eared.



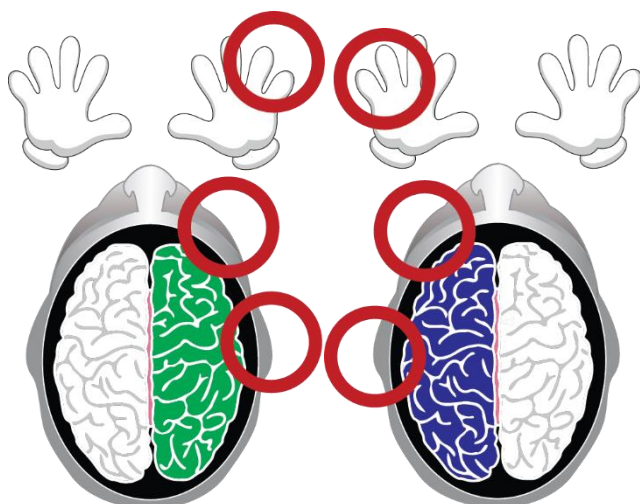
As Jack reads across the page his eyes jump uncontrolled instead of flowing back and forth from line to line. He stops every few lines to think or to re-read something he has already forgotten. His reading voice is strained, high-pitched, rather than his natural speaking voice. He sometimes stumbles over the punctuation or gasps for air in the middle of a phrase. When asked to explain what he has read, he is unable to paraphrase; instead he searches his analytic short-term memory for the exact words of the author. He confides that he has wonderful ideas but seems to forget them the moment he picks up a pencil to write them down with his right hand.

Jack is a 'typical' dyslexic reader, who processes visual information through his dominant left eye. He is homolateral and has survived the educational system by 'parallel processing', alternating from hemisphere to hemisphere, memorizing and 'cramming' his way through printed verbal material.

Blocked Dominance

Many people are dominant in one hemisphere, and use not only the hand controlled by the non-dominant hemisphere, but the eye and ear as well. As a result, for reading, writing, listening, and most academic functions, they are subjected to processing the information with their non-dominant brain hemisphere and personality whenever they are under stress.

This pattern may cause learners to be highly stressed. The person is all right-sided and right-brained, or all left-sided and left-brained. The dominant eye, ear and hand all require the control of the non-dominant brain hemisphere. The dominant hemisphere is difficult to access, especially in the homolateral state. Blocked dominance can result in energy flow hindrances.



Case Study: Edward – Gestalt-Blocked Dominant

Edward is an incredibly talented artist and musician. His paintings are enchanting and when he right-handed, right-eyed, and right-eared.

Edward is "homolateral" and does not use his non-dominant language hemisphere during stress. He stopped practicing his music. He says he was a senior in high school

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NAP Practitioner Training Program

Learning Content Guide

Version: 1.2

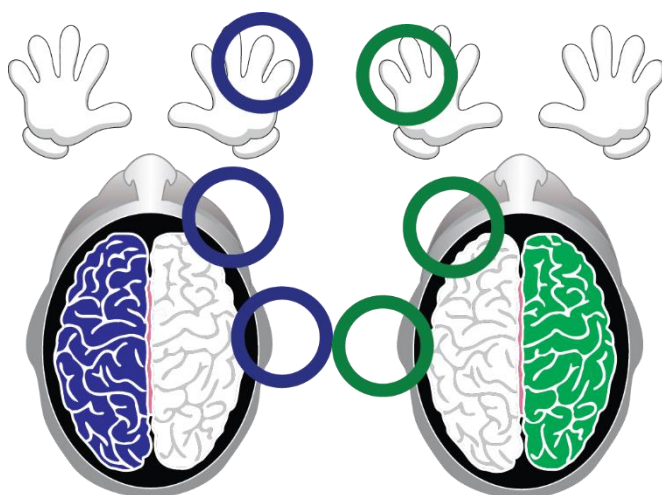
and was competing academically with hundreds for admission to a prestigious Ivy League school. The more he studied, the more stressed, compulsive, mean, and difficult he became.

Miraculously, he survived two major automobile accidents where he had been the driver. Edward experienced difficulties to access his dominant right gestalt brain hemisphere, even to drive, while in this homolateral state of mind. Corrections to help him become bilateral/integrated, and advice to return to his art and music, helped him to achieve more hemispheric integration. He is now able to access both his highly-trained, non-dominant language hemisphere *and* his naturally preferred right-brain hemisphere. Edward is living proof that the whole is more than the sum of its parts.

Uniform Dominance

Laterality is uniform (sometimes called 'normal') and therefore not usually a problem for people who are right-handed, right-eyed, right-eared and left-brained, with expressive (language/analytic) functions centered in the left cerebral hemisphere. These people usually do not have difficulty with reading skills.

People, who are right-hemisphere-dominant, left-handed, left-eyed, and left-eared, would also be considered uniform-dominant. However, they may experience reading difficulty if they use their dominant left eye to read from left to right.



Case Study: George – Full Sensory Access

George is a first-grade child who reads at the fourth-grade level. He is a top achiever in all academic subjects without making any apparent effort. He is the 'teacher's pet' because he is always ready, follows directions and understands everything the teacher says in class.

George is left-brain-dominant, and right-eye, right-ear, right-hand-dominant. His left brain hemisphere processes the information from the right side of his body. Since this situation activates his dominant language brain hemisphere and dominant eye,

ear, and hand, even during stress, he can decode, write, and listen to language without neurological conflict.

By mental age 6 ½, his analytical left brain hemisphere had developmentally taken over the automatic movement of his right hand and right eye, therefore he is able to cross the midline adequately, without ‘switching off’ the gestalt right brain hemisphere. George is able to see the whole and the parts together; to anticipate, remember, and visualize. His dominance pattern has few, if any, learning complications. He is ‘an easy-going kid’ his mother says and ‘very adaptable’.

However, uniform dominance does not guarantee an effortless academic experience. For people like George, the biggest challenge may be language activation to the exclusion of the gestalt. If he is denied positive, enjoyable movement experiences, he may not learn to use his imagination and creativity, or to be able to relax and let go.

He may experience stress from his language brain hemisphere, related to time, goals or self-criticism. He may need to be perfect and often tries too hard. When George is unable to access his gestalt hemisphere for fluid, easy body movement, he may become stiff and robot-like with mechanical body movement.

Uniform Dominant – Writing Development

Sometimes people like George, who have uniform dominance, are so well rewarded for switching off the gestalt brain in school that, by the time they are in third grade, they lose the advantage they had in the earlier grades. They often know the answers but may not write them down because they try too hard; that is, they allow the language, analytic brain hemisphere to control the writing hand so that movement becomes awkward as they vacillate between thought and action.

In this one-sided state they cannot express what they know because their language brain hemisphere, which prefers to do one thing at a time sequentially, is involved in the mechanics of writing instead of lateral thinking and emotional expression. They may experience difficulty in accessing their long-term memory to retrieve the information that they thought they knew.

Uniform Dominance and Reading Development

If learners like George try too hard, they may read with the right eye only and become visually fatigued easily. They cannot always picture (‘gestalt’) the words from the context of the material, thus overly relying on their superior decoding abilities. They may read with a high, shrill voice which shows the stress of the language brain analyzing the text. These learners visually think much faster than they can read mechanically, and are easily bored by this type of information processing.

Uniform-dominant learners with the same profile as George usually do not have the symptoms of dyslexia (reversals and transpositions of letters), experienced by mixed-dominant learners, because their right eye is their dominant eye which naturally moves from left to right. However, the joy of reading depends on the

integrated state where the gestalt eye and brain work together with the language eye and brain hemisphere.

Uniform Dominance and Spelling Development

Learners like George, with uniform dominance, tend to make spelling errors which show that they sound out words rather than visualizing them. They may not always recognize that a word 'looks wrong'.

Uniform-dominant learners do not always seem to sense the similarities between the roots of new words and those they already know. They may repeat the same spelling errors, unable to associate the word they are writing with the same word in long-term memory. Sometimes they may not be able to make use of rhythm clues such as rhymes.

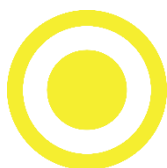
Uniform Dominance and Academic Achievement

Uniform-dominant learners like George tend to experience ease with learning in school and can perform well academically with relatively little stress. They are usually good workers, although they may lack imagination. Sometimes they have difficulty expressing their feelings and may be unable to associate creativity and feeling with work or success. They may not always see the connection between life and school, and later, life and work.

Interpreting the Impact of the Information Processing Style



No risk for human error during stress!
Uniform-Dominance (no senses causes a hindrance to process information)



Low risk for human error during stress
Mixed-Dominance (only one sense causes a hindrance to process information)



Moderate risk for human error during stress
Mixed-Dominance (Two senses causes a hindrance to process information)



High risk for human error during stress
Blocked-Dominance (three senses causes a hindrance to process information)



- Consider impact of access (strength) or blocked (neurological) hindrance, category and risk for error;
- Consider overall brain fitness & neuro-balance (and/or);
- Consider the processing preferences of the dominant hemisphere & senses on thinking, learning and personality;
- Consider the impact of stress and fatigue on the processing preferences of the non-dominant hemisphere & senses (default mode).

Brain & Sensory Dominance Profiles

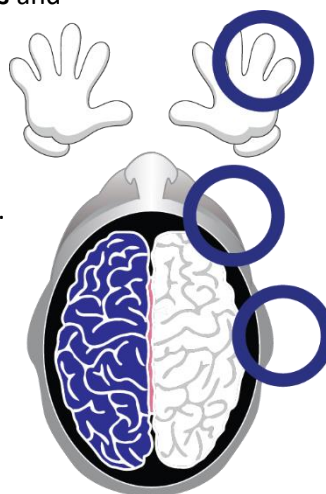
As previously mentioned, There are 16 possible combinations of dominance profiles that emerge. We can now analyze the most natural information processing style for each individual person.

Each profile will be discussed, based on how the individual innately processes information under unfamiliar and stressful conditions, where new learning is occurring or survival is an issue.

Each brain hemisphere and sense have specific processing functions. This way each hemisphere and sense avoids duplication of functions and complement each other. In your natural, relaxed state you will usually experience balance between all functions. There is, however a natural tendency for one hemisphere eye, ear and hand to lead. This dominance pattern will affect how you respond, especially during stress and in new learning situations. It will have an influence on your personality and how you learn, think and communicate. Here with, your unique style of processing information:

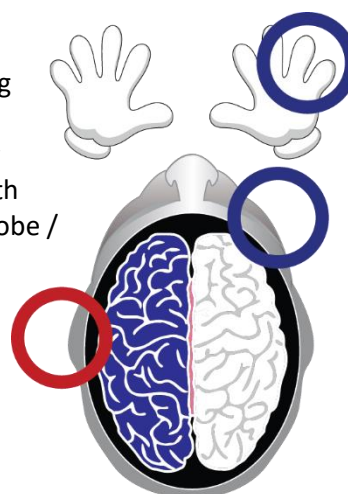
Profile A:

You are left brain hemisphere dominant and have **full sensory access**, through your dominant senses on the right side of your body to your dominant left brain hemisphere, even during stress ($\pm 17\%$ of society have your profile). This means that you are a logical, **visual** (see) **auditory** (hear) and **communication** (talk, write and do) learner. Processing **visual details, listening to words, instructions, and facts** and also **talking** and/ or **writing**, comes naturally to you. You may have a tendency to focus more on detail (missing the forest and focusing on the trees when looking at a forest), wanting to analyze, verbalize, and /or write when learning. Usually you see, hear and easily communicate detail during stress, but may experience difficulty to see the big picture. You may naturally prefer to follow step by step, visual and / or auditory instructions. **Language, both oral and written** is very important for you during learning, therefore you learn well by using **words** and **instructions**. Your right eye prefers to scan from left to right, making the mechanics of reading and processing **visual details** easy for you. When communicating, you tend to focus more on words, details and **what** people say, rather than how they say it. Language also stimulates your thinking and memory. Your movements may then tend to be more planned – thinking before moving rather than spontaneous, fluid movements. People refer to your profile as the “**teacher’s pet**”, because you tend to experience **ease with learning** and processing information.



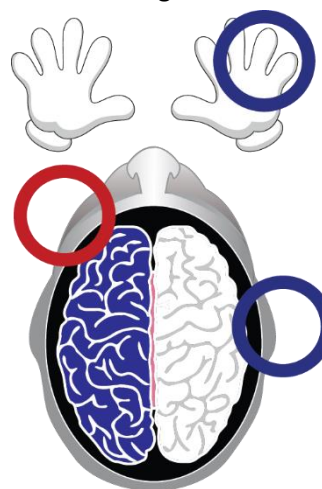
Profile B:

You are a left brain hemisphere dominant, **visual** (see) and **communication** (talk, write and do) learner with an auditory (hear) neurological hindrance during stress ($\pm 17\%$ of society has your profile). This means you learn well by focusing on **visual details** and then implementing it. Your right eye prefers to scan from left to right, making the mechanics of reading and processing visual details easy for you. You tend to see and **communicate** detail with good language skills, but do not process verbal input like words as well. **Language both oral and written** is very important to you for learning and memory, therefore you learn well by processing **words** and **instructions** that you can read. You tend to naturally express your thoughts and emotions through **oral** or **written language**. **Talking** about specifics or rationalizing it, is natural for you. Language also stimulates your learning and thinking processes. During stress, you may experience difficulty with memory, spelling and / or math because of the neurological hindrance in the temporal lobe / limbic area. When relaxed, you tend to listen more to how people say things, than what they say. Your movements usually tend to be planned – thinking before moving, rather than spontaneous, fluid movements. Brain integration techniques and activities can be highly beneficial for you.



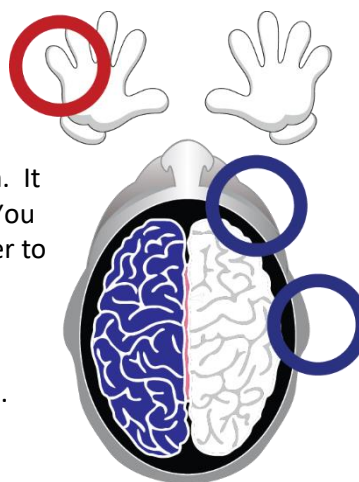
Profile C:

You are left brain hemisphere dominant and an **auditory** (hear), and **communication** (talk, write and do) learner with a visual (see) neurological hindrance during stress. ($\pm 8\%$ of society have your profile). This means that you have a strong verbal preferences and the natural strength of **listening to details**, but may experience difficulty to process visual detail during stress. When learning, information is easily processed by **hearing** and then **talking** about what you just learned. You may not enjoy reading or remember every detail that is read. Your left eye prefers to scan from right to left; therefore you may experience letter reversals (turning letters or numbers around or upside down) when stressed or homolateral. During stress the visual hindrance you experience may slow your reading speed and comprehension down. **Language both oral and written** is very important for learning and memory, therefore you learn very well by using **words** and **instructions**. When communicating, you tend to focus more on words; details and **what** people say, rather than how they say it. You can also express your thoughts easily. Your movements tend to be planned – thinking before moving, rather than spontaneous fluid movements because of potential hand-eye coordination difficulty during stress. Fine motor hand-eye coordination activities and brain integration exercises can be highly beneficial for you.



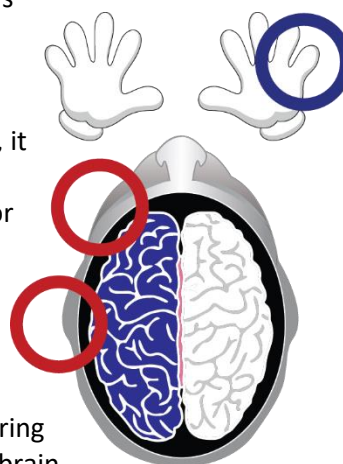
Profile D:

You are left brain hemisphere dominant and a **visual** (see) and **auditory** (hear) learner with a communication (talk, write and do) hindrance during stress. ($\pm 1\%$ of society have your profile). This means that you easily process specific visual and auditory information but may experience difficulty in communicating it logically in a written way, or understanding the bigger picture during stress. Your right eye prefers to scan from left to right, making the mechanics of reading and processing of **visual details** easy for you. When learning or communicating, you tend to **listen** more to words, detail and **what** people say, rather than how they say it. When relaxed, you may communicate the image and emotional context well. **Language** is important for you when learning and understanding new information. It also stimulates your thinking and memory processes. You may need to move, touch and manually explore in order to organize and express information. Your movements usually tend to be planned – thinking before moving, rather than spontaneous fluid movements because of potential hand-eye coordination difficulty during stress. Fine motor hand-eye coordination activities and brain integration exercises can be highly beneficial for you.



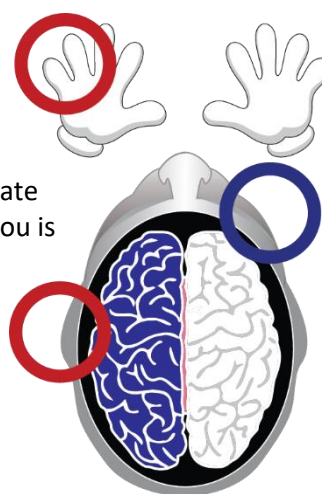
Profile E:

You are a left brain hemisphere dominant and **communication** (talk, write and do) **learner** with a visual (see) and auditory (hear) hindrance during stress. ($\pm 1\%$ of society have your profile). This means that when you are relaxed, you may take in the whole picture through your eyes and ears, and can then structure and sequence information in an orderly manner. Because you tend to be **highly verbal**, you may enjoy **talking** and **writing** but may experience difficulty listening to, or seeing detail when experiencing neurological stress. Your dominant left eye prefers to scan from right to left and may cause letter reversals (turning letters or numbers around or upside down) and difficulty with reading speed and reading comprehension during stress or if you are homolateral. You also may not always remember what you read because of the visual hindrance you experience during stress. **Language** for you is important when learning and thinking. If you can **explain, debate, discuss** or **summarize** new information, it will easily be learned. The auditory hindrance during stress may cause difficulty with memory, spelling and / or math because of the neurological hindrance in the temporal lobe / limbic area. When relaxed you focus on how people say things than what they say. Your movements tend to be planned – thinking before moving, rather than spontaneous fluid movements because of potential hand-eye coordination difficulty during stress. Fine motor hand-eye coordination activities and brain integration exercises can be highly beneficial for you.



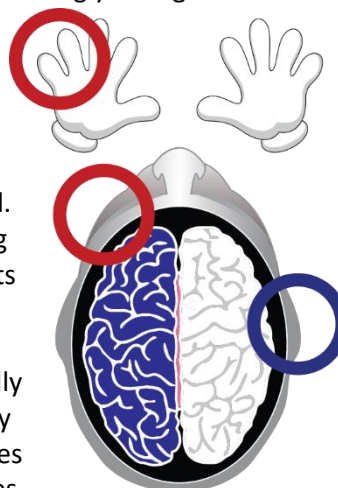
Profile F:

You are left brain hemisphere dominant and a **visual** (see) learner with an auditory (hear) and communication (talk, write and do) hindrance during stress. ($\pm 2\%$ of society have your profile). This means that you are able to **see detail** but may experience difficulty with listening, memorizing or communicating it in a logical context, during stress because of the kinesthetic and auditory neurological hindrance. Your right eye prefers to scan from left to right, making the mechanics of reading and processing visual details easy for you. When relaxed you may usually enjoy listening to the tone, rhythm and emotional content of music and language, focusing more on **how** people say things than what they say. The auditory hindrance you may experience during stress, may cause difficulty with memory, spelling and / or math because of the neurological hindrance in the temporal lobes / limbic system area. Also you may need to **move, touch** and **manually explore** in order to organize and **express information**. When relaxed, you may prefer to communicate visual images, pictures and emotions well. **Language** for you is important when learning and understanding new information. Your movements usually tend to be planned, thinking before moving, than spontaneous fluid movements because of potential hand-eye coordination difficulty during stress. Fine motor hand-eye coordination activities and brain integration exercises can be highly beneficial for you.



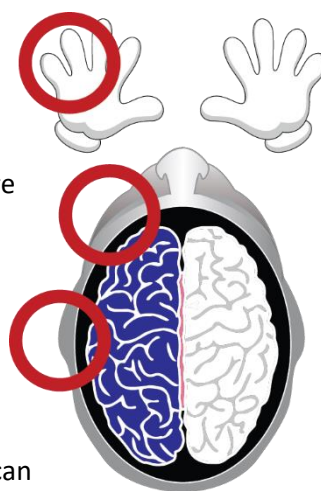
Profile G:

You are left brain hemisphere dominant and an **auditory** (hear) learner with a visual (see) and communication (talk, write and do) hindrance during stress. ($\pm 1\%$ of society have your profile). As an auditory learner you **listen well** to words, facts and **what** are said and usually have a **good memory for details**, spelling and / or math. You learn well by **hearing** the information, but may not prefer to look at the facilitator / trainer or the white board / screen when learning or trying to understand new information. Processing information during learning usually works well for you when closing your eyes or looking away and turning your right ear towards the auditory source of information. Also you may experience letter reversals (turning letters and numbers around or upside down) during stress or if you are homolateral, because your dominant left eye prefers to scan from right towards left. This may cause difficulty with reading comprehension and reading speed. Movements for you usually tend to be planned – thinking before moving, rather than spontaneous fluid movements because of potential hand-eye coordination difficulty during stress. When relaxed, you may enjoy painting pictures with your words, being emotionally and physically expressive. When stressed, you may experience difficulty with penmanship and / or hand-eye coordination activities and can therefore benefit from brain integration exercises.



Profile H:

You are left brain hemisphere dominant and are fully sensory blocked during stress. ($\pm 2\%$ of society have your profile). This means you best **internally process information** (focusing inwards) without external sensory stimulation. **Quiet time** alone is especially beneficial for you when learning and thinking. When relaxed, your visual (see) and auditory (hear) processing will include emotions and the bigger picture. Your left eye may cause difficulty with reading comprehension and reading speed. Also you may experience letter reversals (turning numbers or letters around or upside down) during stress or if you are homolateral because your left eye prefers to scan from right towards left. It may also happen that you experience coordination difficulty to remember what you read. You may need to move, touch and manually explore in order to organize and express your feelings and new information. Your dominant left hand may indicate difficulty with communicating and writing down your thoughts and feelings. When relaxed, you may be emotionally and physically expressive. If you are not stressed, you can more **easily integrate** your logical left brain hemisphere and your creative right brain hemisphere than other profiles. This is because your dominant logical brain hemisphere receives information from your non-dominant senses. The preferential sensory-motor access of the dominant hand, eye and ear goes to the creative hemisphere, which allows you to handle both logical and creative functions easily, simultaneously. When stressed, you may experience difficulty with penmanship and or hand-eye coordination activities and can therefore benefit from brain integration exercises.



Profile I:

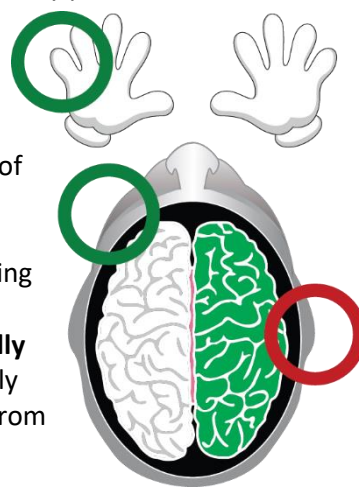
You are right brain hemisphere dominant and have **full sensory access** through your dominant senses to your dominant hemisphere, even during stress. ($\pm 3\%$ of society have your profile) This means that you are a creative, **visual** (see), **auditory** (hear) and **kinesthetic** (do) learner. Learning through **movements** and **experiences** is a natural strength for you. You most effectively process the big picture using all the senses, however you may sometimes pay less attention to detail. Processing **visual images** like pictures, photographs, videos' diagrams and illustrations is a strength for you. Reading contextual details may not be a natural preference for you. **Shapes, colors** and **patterns** may work well for you when learning. Your dominant left eye may cause letter reversals when reading (turning letters or numbers around or upside down) because it prefers to scan from right to left. When listening, you tend to listen more to **how** things are said and may therefore prefer music and non-verbal sounds over speech. Your dominant left hand also increase the need to be kinaesthetic (movement and **action-orientated**) during learning. You need to **move** (especially the hands) and



touch to effectively process new information, and are a **physically and emotionally expressive** learner and thinker. **Metaphors, examples** and **associations** may work very well for you to solve problems. When absorbing new information you may need to look and listen for the intention and emotion of the person and / or information. Processing information about emotion and **experiences** may often be a natural focus area for you. You also may prefer to process information in an **intuitive** manner, strongly relying on your “gut feelings”.

Profile J:

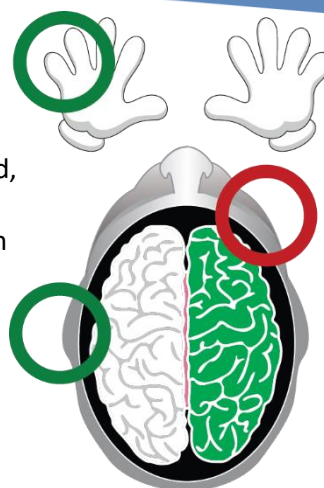
You are right brain hemisphere dominant and a **visual** (see) and **kinesthetic** (do) learner with an auditory (hear) neurological hindrance during stress. ($\pm 1\%$ of society have your profile). You learn well through **movements** and **experiences**. Your information processing style indicates that you learn easily by **seeing** and **doing**. Processing **visual images** like pictures, photographs, video's diagrams and illustrations is a strength for you. Reading contextual details may not be a natural preference for you. **Shapes, colors** and **patterns** may work well for you when learning. Although you are visually oriented, your left eye may cause letter reversals and difficulty with reading (turning letters or numbers around or upside down), because it prefers to scan from right to left. Your dominant left hand also increases the need to be kinesthetic (movement and **action-orientated**) during learning. You need to **move** (especially the hands) and **touch** to effectively process new information. When communicating under stress, you may experience difficulty with listening to what people say because of an auditory neurological hindrance. It may also happen that you experience difficulty with memory, spelling and / or math because of the neurological stress that cause a hindrance in the temporal lobe / limbic area. When relaxed, you may listen more to detail and what is being said. When solving problems, **metaphors, examples** and **associations** may work well for you. You are an **emotionally** and **physically expressive** thinker and learner. Your movements usually tend to be spontaneous and fluid, but you can benefit from fine motor, hand-eye coordination activities and brain integration exercises.



Profile K:

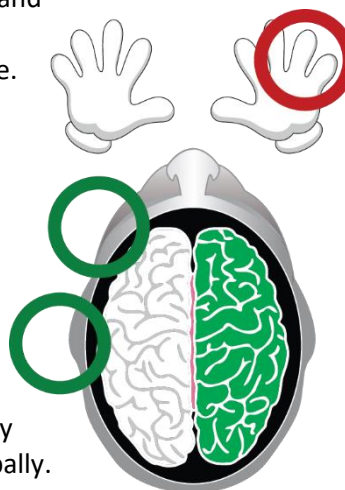
You are right brain hemisphere dominant and an **auditory** (hear) and **kinesthetic** (do) learner with a visual (see) neurological hindrance during stress. ($\pm 1\%$ of society have your profile). You learn well through **movements** and **experiences**. When listening, you tend to listen more to **how** things are being said than to what is said. You may tend to prefer **music** and **nonverbal** sounds over speech. Your dominant left hand also increases your need to be kinesthetic (movement and **action-orientated**) during learning. It increases your need to **move** (especially the hands) and **touch** to effectively process new information. Processing information works best for you through **listening, doing** and then communicating what has been learned. Even with the visual neurological hindrance during stress, your dominant right eye will prefer to scan from left to right, making the mechanics of reading and

writing easy. You are a holistic thinker but may sometimes miss details in a stressful situation. When solving problems, you appreciate **metaphors, examples and associations**. You tend to be a **physically and emotionally expressive** thinker and learner. When relaxed, you may tend to visually focus on detail. Your movements usually be spontaneous and fluid, but you can benefit from fine motor, hand-eye coordination activities and brain integration exercises.



Profile L:

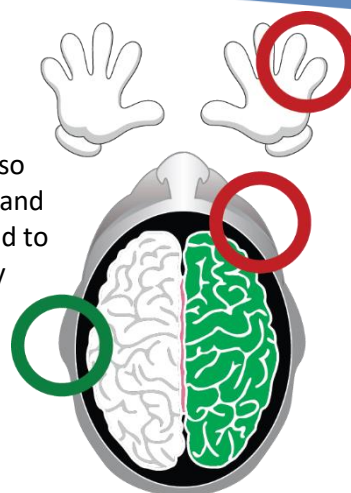
You are right brain hemisphere dominant and a **visual** (see) and **auditory** (hear) learner who experiences a communication (do or write) neurological hindrance during stress. ($\pm 5\%$ of society have your profile). Right brain dominance means that you learn well through **movements and experiences**. You tend to be more kinaesthetic, holistic and creative than logical. You may also prefer to learn through **visual images** like pictures, photographs, video's, diagrams and illustrations rather than reading contextual details. **Shapes, colors and patterns** are very important to you when learning. You tend to process whole images and visual concepts easily but may experience difficulty in formulating and expressing it through detailed language. You may also experience difficulty with reading speed and experience letter reversals (turning numbers or letters around or upside down) due to your dominant left eye that prefers to scan from right to left. When **listening**, you tend to focus more on **how** people say things than on what they say. Your movements usually tend to be spontaneous and fluid when relaxed, but you can benefit from fine motor, hand-eye coordination activities and brain integration exercises. When stressed, you may experience difficulty expressing yourself and formulating your thoughts verbally.



Profile M:

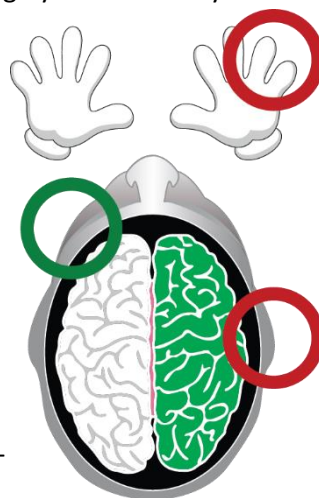
You are right brain hemisphere dominant and an **auditory** (hear) learner with a visual (see) and communication (do or write) neurological hindrance during stress. ($\pm 9\%$ of society have your profile). You are an **auditory learner** that needs to hear the **intention and feeling** of the person and / or information. Listening to **how** people talk are more important for you than what they say. You usually exhibit good memory for **holistic concepts or images**. Right brain hemisphere dominance means that you learn well through **movements and experiences**. You actively process and synthesize non-verbal information and prefer holistic concepts to detail, but may need to close your eyes when learning or trying to understand new

information. You also may experience difficulty with having a visual perspective of a new situation or verbalizing it, when experiencing neurological stress. Often you may appear to daydream, preferring **music, rhythm** and **non-verbal sounds** over speech. You can also focus on developing the relationship between language and movement. When relaxed, your movements usually tend to be spontaneous and fluid. You may experience difficulty expressing yourself and formulating your thoughts during stress.



Profile N:

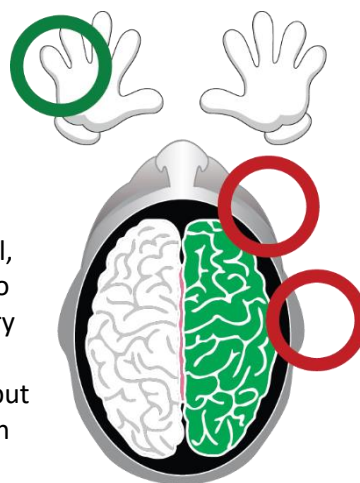
You are right brain hemisphere dominant and a **visual** (see) learner with an auditory (hear) and communication (do or write) neurological hindrance during stress. ($\pm 9\%$ of society have your profile). This means that you are a **visual learner** that must **see** the big, three dimensional picture and **emotional elements** to learn. Processing **visual images** like pictures, photographs, video's, diagrams and illustrations is a strong preference for you, rather than reading contextual details. **Shapes, colors** and **patterns** may work well for you when learning. Although you are visually oriented, you may experience difficulty with reading comprehension and letter reversals (turning numbers and letters around or upside down) due to your dominant left eye that prefers to scan from right to left. Under stress you may also experience difficulty with memory, spelling and / or math due to the auditory neurological hindrance in the temporal lobe/ limbic area. During stress you could also experience difficulty with logical communication of verbal details, expressing yourself and formulating thoughts. Learning through **movements** and **experiences** work well for you. When relaxed, your movements usually tend to be spontaneous and fluid, but you can benefit from doing fine motor, hand-eye coordination activities and brain integration exercises.



Profile O:

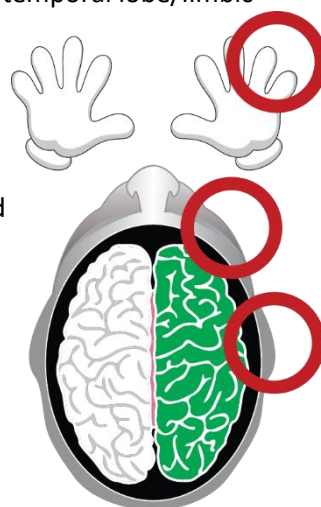
You are right brain hemisphere dominant and a **kinesthetic** (write or do) learner with a visual (see) and auditory (hear) neurological hindrance during stress. ($\pm 1\%$ of society have your profile). You learn well through **movements** and **experiences**. It is important for you to **move** (especially the hands) and **touch** in order to learn and think. You may often feel as if you forget what you hear, see or read during stress. It is not necessary for you to look at, or hear the new information as much as totally being a part of **doing** it to learn and think.

You are movement and **action-oriented** during learning and thinking. During stress you may experience difficulty with memory, spelling, and math due to the neurological hindrance in the temporal lobe / limbic area. You are a physically and **emotionally expressive** thinker and learner. When solving problems, **metaphors, examples** and **associations** may work well for you. When relaxed you may process visual and auditory detail well, but may experience difficulty in communicating them in a logical, sequential way. When stressed, you need time alone to process information internally without visual or auditory stimulation, perhaps even closing your eyes. Your movements usually tend to be spontaneous and fluid, but you can benefit from fine motor, hand-eye coordination activities and brain integration exercises.



Profile P:

You are right brain hemisphere dominant and fully sensory blocked during stress. (+15% of society have your profile). You learn well through **movements** and **experiences**. Your information processing style suggests that you most easily **processes internally** (focusing inward) without external sensory stimulus. **Quite time** alone to effectively integrate new ideas and process information may work for you well. People with your processing style enjoy to **see and feel images** that provide the **big picture**. It may happen that you experience difficulty in breaking images down into specific verbal pieces and communicate what you see, feel, or understand during stress. Within a high stress situation, with verbal frustration in expressing yourself clearly, you may sometimes physically lash out, experiencing emotional outbursts from time to time. You could also sometimes forget what is read when pressurized because of the visual neurological hindrance during stress. People believe this to be the Einstein dominance profile. This learning style prefers **metaphors, examples** and **associations** when solving problems, learning or thinking. During stress you may experience difficulty with memory, spelling and / or mathematics because of the neurological hindrance in the temporal lobe/limbic area. Your movements usually tend to be spontaneous and fluid when relaxed. You may be at a disadvantage during stress in that all the information that comes in through your dominant senses goes to a “switched off” brain hemisphere. However, when relaxed, you can **more easily integrate** the logical left brain hemisphere and the creative right brain hemisphere. This is because your non-dominant logical brain hemisphere receives information from your dominant hand, eye and ear, while information from your non-dominant senses are processed to your dominant creative brain hemisphere. When stressed, you may experience difficulty with penmanship and/or hand-eye coordination activities and can therefore benefit from brain integration exercises.



11 Intelligence Preferences

The question today is no longer: “How smart am I? What is my IQ? The question is “How am I smart? What is my strongest intelligence preference? All people are smart – just in different ways. Neuro-Link has identified 11 intelligence preferences of how people are smart and how they would prefer to think and learn. When there is alignment between intelligence preferences, subjects and career choices, people become passionate about life and their work.

How a person’s preferred intelligences influence how they think.

Mathematical / Logical / Abstract Intelligence

People with this intelligence think in numbers and patterns and prefer clear and analytical approaches. They prefer to work with math and science, focus on detail, and deal with complex, logical systems.

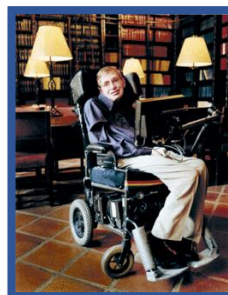


Isaac Newton

These people focus on planning and structuring and rely on sequential thought. They learn by relying on their logical reasoning ability, use abstract symbols and solve logical problems easily. It is the intelligence preference of most scientists, engineers, accountants and lawyers.

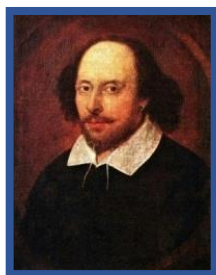
Famous mathematically smart people:

- Pythagoras & Andrew Wiles – Mathematicians
- Isaac Newton & Albert Einstein – Scientists



Stephen Hawking

Verbal / Linguistic / Language Intelligence



Shakespeare

This is the ability to be sensitive to the meaning and order of words, whether in speaking, writing or studying the structure of language itself. It is the intelligence preference of most poets, writers, teachers, politicians and actors.

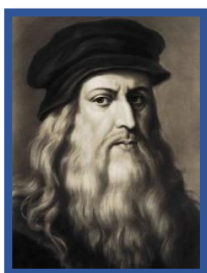
People are word-smart when they think in words, have a good vocabulary, learn through discussions, focus on effective communication, and are interested in reading and writing.

Famous word-smart people:

- William Shakespeare - Writer
- Oprah Winfrey – Talk show host
- Joyce Meyer – Author / Speaker
- J.R.R. Tolkien – Writer



Oprah Winfrey

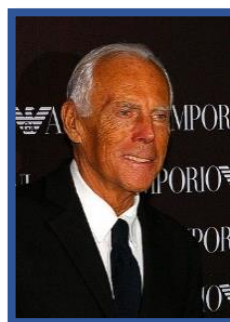
Visual / Spatial Intelligence

Da Vinci

People with a visual/spatial intelligence think in pictures and images, are good with spatial relationships, have a good eye for detail and color, see solutions to problems, learn by way of visual aids, and like to draw and create.

They have an accurate perception of the visual world and can recreate or alter it in the mind or on paper. They have a great sense of direction and are very aware of their surroundings.

Blind people also have a strong spatial sense, which helps them think about moving around in the world without the sense of sight. It is the intelligence preference of most architects, artists, sculptors, interior decorators, photographers and dramatists.



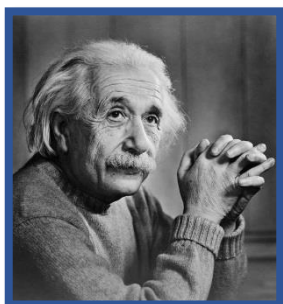
Giorgio Armani

Famous visually smart people:

- Picasso & Van Gogh – Artists
- Giorgio Armani – Clothes designer
- Leonardo da Vinci – Sculptor / Architect
-

Physical / Kinaesthetic Intelligence

These people prefer hands-on performance and learn through movement, emotions and practical experiences. They are able to use their bodies skillfully for self-expression and achieving physical goals (e.g. in dancing, acting or athletics).

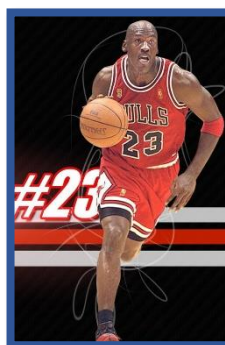


Albert Einstein

Some of the world's greatest thinkers (among them Albert Einstein) had to feel their ideas in their bodies in order to think effectively. It is the intelligence preference of most sculptors, musicians, mechanics, technicians, sportsmen, dancers and stunt men.

Famous physically smart people:

- Michael Jordan – Basketball player
- Albert Einstein – Scientist
- Jackie Chan – Stunt performer
- Mikhail Baryshnikov – Dancer

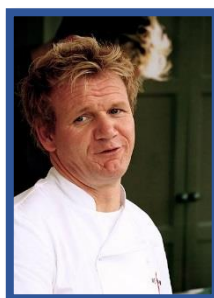


Michael Jordan

Sensory Intelligence

Walt Disney

The ability to use each of your five physical senses and your sixth sense (intuition) to their full potential. This is the common intelligence of movie producers, clothing designers, wine connoisseurs and chefs, investigators, musicians and pre-primary school teachers.



Gordon Ramsay

Famous sensory smart people:

- Walt Disney – Movie producer
- John Adlum – Viticulturalist
- Gordon Ramsay – Chef
- Steven Spielberg – Movie director

Interpersonal / Social / People Intelligence

Interpersonally smart people enjoy spending time with and communicating with



Mother Teresa

others, having many friends and participating in group activities. They are good at mediating disputes, negotiating, relating to people and reading others' intentions. It is the intelligence preference of politicians, teachers, religious leaders, counsellors, sales people, managers and public relations officers.

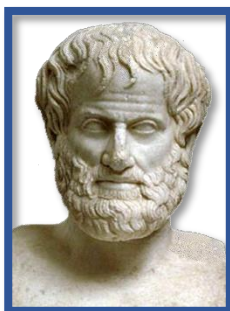


Nelson Mandela

Famous people-smart people:

- Mother Theresa – Philanthropist / Missionary
- Bill Clinton – President
- Nelson Mandela – President / Philanthropist
- Viktor Frankl – Psychiatrist / Writer
- Dr. Phil

Intrapersonal / Self-Intelligence



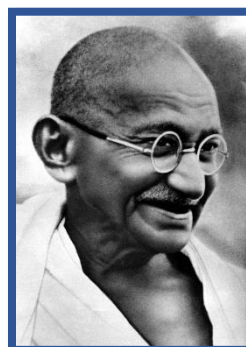
People who are self-smart have a well-developed sense of self, a preference for self-knowledge and a deep awareness of their own feelings, strengths and weaknesses. They are highly intuitive and have a sensitivity to their own values and purpose in life. They are self-motivated, private people who want to be different from the mainstream.

It is the intelligence preference of novelists, counsellors, wise elders, philosophers and gurus.

Aristotle

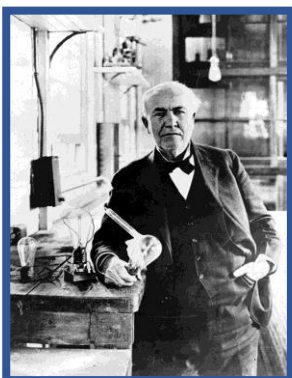
Famous self-smart people:

- Mahatma Gandhi – Leader
- Aristotle – Philosopher / Scientist
- Oprah Winfrey – Talk show host
- Nelson Mandela – President / Philanthropist
- Victor Frankl – Psychiatrist / Writer



Gandhi

Creative / Innovative Intelligence



Thomas Edison

The ability to think in new ways is original, fluent in generating ideas and looking at things from different angles.

This is the preference of most inventors, entrepreneurs, parents, musicians, painters, poets and comedians, fashion designers, movie directors, architects, artists, inventors and entrepreneurs.

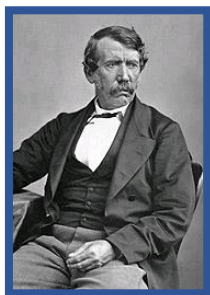


Richard Branson

Famous creative-smart people:

- Thomas Edison – Inventor
- Calvin Klein – Fashion designer
- Richard Branson – Business entrepreneur
- Steven Spielberg – Movie director

Naturalistic Intelligence



David Livingstone

The intelligence of nature, one's environment and the world we live in. This intelligence reflects a person's ability to interact with animals, plants, trees and flowers and to be interested in global and environmental issues, and subjects like astronomy and biology.

It is the intelligence preference of most farmers, botanists, nature conservationists, animal trainers and psychologists.

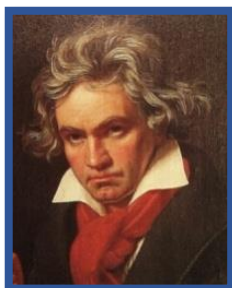
Famous nature-smart people:

- Bear Grylls – Adventurer
- David Livingstone – Explorer
- Steve Erwin – Nature conservationist



Bear Grylls

Musical Intelligence



Beethoven

A person's ability to identify pitch, rhyme and rhythm, and understand the emotional power and complex organization of music.

It is commonly found in performers, composers, conductors, musical audiences, recording engineers, instrument designers and piano-tuners.

Famous music-smart people:

- Beethoven
- Mozart
- Madonna
- Neil Diamond
- John Lennon



Mozart

Spiritual Intelligence

The ability to visualize how all things in life form part of a 'bigger picture'. Having the ability to reach out to others while overlooking your own interests and having a fundamental respect for life and humanity.

Commonly found in philanthropists, missionaries, ministers, pastors and leaders.



Florence Nightingale

Famous spiritually smart people:

- Florence Nightingale – Philanthropist
- Mother Theresa – Philanthropist / Missionary
- Nelson Mandela – President / Philanthropist
- Mahatma Gandhi – Leader



Mother Theresa

Interpreting the Intelligence Preferences

- Consider overall brain fitness.
- Consider the impact of your naturally preferred intelligences on your thinking, learning, personality, job function and how you are talented.
- Consider the impact of your less preferred intelligences on your thinking, learning, personality and job.
- Consider alignment of preferences with job function.

How To Improve Neuro Flexibility

- Optimize your natural intelligence preferences by developing skills aligned with your preferences to increase your competence.
- Prioritize which intelligences are least preferred, but should be developed to increase ease, speed and flexibility.
- Maintain integrative balance between developing intrapersonal and interpersonal skills (EI)
- Align how you are smart/talented with what you do (your job function).

Module 8: Drivers that Optimize Your Brain Performance



- ✓ Brain Fitness
- ✓ Stress
- ✓ Sleep
- ✓ Movement
- ✓ Attitude
- ✓ Brain Food
- ✓ Brain Ergonomics
- ✓ Mental Skills

All people have potential, but different kinds of potential, based on their neurological design. Knowing one's unique neurological design and understanding the drivers that optimize brain performance, is the key to potential development and performance optimization. Effective and successful people understand and manage their neuro-design and the drivers that optimize it, so they can get what they want and become who they can be.

Our world has a dualistic approach on most things. People are either left hemisphere or right hemisphere dominant, expressive or receptive, rational or emotional. It causes a limiting view of who we are. Dualism does not accommodate the concept that we are whole brained people who can do whatever is expected of us. The better perspective should be one of inclusiveness – people **are** left hemisphere and right hemisphere, expressive **and** receptive, rational **and** emotional. One region may lead because it is dominant, but the other region can function as effectively as the dominant region. When all brain regions are firing on all cylinders simultaneously, there is a multiplication effect that optimize the brain's performance to enable them to get the most out of their brain.

The brain has the potential to help people do whatever life requires of them. It has unlimited potential in terms of what we can learn, think and create. Sometimes we may not appear to act like people with unlimited potential, because there may be a lack of some drivers that optimize their performance. To optimize brain performance and enable all brain regions to function simultaneously as one functional whole brained system, we need to provide it with the right fuel, physical and mental stimulation and create the right conditions to thrive.

Drivers like brain fitness, sleep, stress, diet, mind-set, movement, cognitive skills and the physical environment can either negatively, or positively, influence the brain's performance. To get the most out of the brain, it is essential to know how these drivers impact a person's neurological design and learn appropriate skills to optimize the drivers that optimize brain performance.

Brain Fitness

The first avenue to explore if someone is not performing well, is to ask:

“How brain fit are they?”

It is one of the primary drivers to optimise your brain’s performance. Brain fitness is a vital pre-requisite for optimised performance, success, happiness and efficiency.

Brain fitness is about utilizing all brain regions simultaneously as one functional integrated system. People are not born brain fit. It is something we need to develop and maintain through regular physical exercises and mental stimulation. **Lack of brain fitness** will result in alternating between hemispheres rather than processing information simultaneously, causing you to think, learn and process information **longer, slower and harder**.

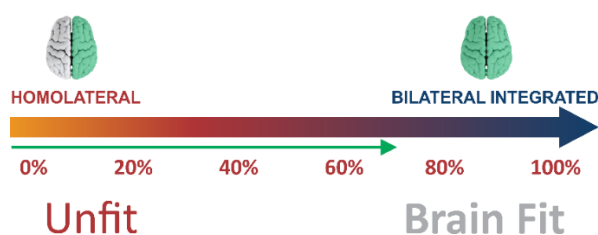
Optimizing a person’s **brain fitness** will result in **ease with learning, thinking faster and smarter and processing information more effectively**. People are born with 2 legs but still have to learn how to walk and run. Similarly, we are born with 2 brain hemispheres, but have to learn how to utilize both hemispheres simultaneously in an integrated manner. Utilizing both brain hemispheres and all brain regions is a developed capacity, not an automatic outcome.

Dealing with information overload all the time but not being “brain fit” enough, will cause us to work longer, slower and harder. Lack of the presence of this driver in your lifestyle can significantly inhibit your brain’s performance.

Human beings are uniquely designed to function either **bilaterally / integrated** (two-sided) or **homolaterally specialised** (one-sided).

Our species needs to be **two-sided (bilateral)** for most movement skills, vision, hearing and hand-eye co-ordination. If we rely too much on one brain hemisphere alone, instead of using both hemispheres simultaneously, we **place unnecessary and stressful demands** upon our neurological system causing us to work longer and slower, rather than faster and smarter.

Because of a lack of proper development, some people are limited to **“one-sided”** thinking and learning, accessing only one side of the brain at a time in an alternating or **homolateral** fashion. Homolaterality may cause people to learn and think slower and longer, slowing down their performance, causing it to be more difficult.



The first step towards performance improvement and effective learning and thinking, is to use **both brain hemispheres simultaneously** in a **bilateral** fashion.



Brain fitness is about all areas of the brain being accessible, receptive and responsive to absorb and process information at optimum capacity.



Refer to your NAP™ Advanced+ brain profile assessment.

How brain fit are you?



*We can also refer to this as being **brain fit**, whole-brain functioning or an **integrated state**.*

Let's illustrate this through a practical example:

Clap your hands in front of your nose. Now cross your hands and simultaneously touch your left ear with your right hand and with your left hand touch your nose. Clap again and change over hands i.e. touch the right ear with your left hand and touch your nose with your right hand. Do this 5 times. Can you do this without any hesitation or difficulty?

Laterally-integrated people have learned how to use the two brain hemispheres together, as a whole system. Homolateral ('switched off') people have to learn to use more than one hemisphere at a given time. They function in a very limited way, in controlled and rigid patterns. Many disabilities, difficulties and diseases that people experience, are symptoms of failure to achieve the integrated, whole-brain state. If we learn to use the whole brain, disabilities, difficulties or diseases may start to diminish or disappear.

Homolaterality – the one-sided state

The first step towards reaching the integrated state is through bilateral integration, where people have access to both the right and left hemispheres at the same time, and therefore, both eyes, both ears, and both sides of the body. Homolateral people are limited to 'one-sided' processing because they have access to only one brain hemisphere at a time, and must 'switch off' one hemisphere each time they want to use the other, in alternating fashion. Although they can be adept at this 'parallel processing', they usually experience a co-ordination challenge at some level, depending on the level of their homolaterality. They have not yet developed using the two hemispheres of the brain simultaneously through the corpus callosum, as we were designed to do.

In order to read, write, spell, listen, or be integrated for any activity, we must be able to cross the midline which connects right and left brain hemispheres. The left brain hemisphere and right hand have a positive polarity and the right brain hemisphere and left hand have a negative polarity. The midline is either a bridge or a barrier to learning, depending on polarity imbalances within our neurological system. When the right and left brain hemispheres communicate spontaneously, working together at the same time, the midline becomes a bridge, connecting both brain hemispheres. When the right and left brain hemispheres function in alternate fashion, the connection is broken, and the midline becomes a barrier / hindrance.

People may have a midline barrier for many reasons. Usually the cause is homolaterality. Whether homolaterality affects the eyes, ears, body as a whole, or one of the countless other ways we might 'switch off', we must learn to 'cross the midline' before we can experience ease with learning.

For example, people who switch off the right analytic/language ear in a learning situation, become so absorbed in the gestalt, the intonation of the trainer/teacher's voice or outside noises, that they lose sense of the meaning of the words. Right analytic/language-eye readers might switch off the gestalt (left) eye, therefore breaking down the words into sounds but unable to blend them into whole units, or



Tip for left hemisphere individuals: To be more whole-brain oriented, left brain oriented people should explore aspects like ambiguity, emotions and the importance of movement. Focus on the big picture. Think in pictures. Practice visualizing images and concepts in the mind's eye. People have to rely more on their gut instincts and trust their intuition. Learn through movement and experience.



Tip for right hemisphere individuals: To be more whole brain oriented, right brained people should explore communicating the detail and linear aspects of learning. Break large concepts into smaller pieces. Analyse decisions and go through a logical reasoning process. Practice sequencing more. Develop the ability to manage time effectively. Use words and instructions to learn.



to register them in the long-term, visual memory. The possible combinations of switching off are endless and unique.

Homolateral people are confused by bilateral activity. Walking, swimming, running, or jogging, all require increased conscious effort and control, which causes them to switch off the gestalt brain. Instead of relaxing and energizing them, these activities seem to cause further frustration and may even lead to injury. Their tendency may be to avoid large muscle activity, or to place high demands on their bodies to achieve goals, as opposed to the pure intrinsic reward of joyful movement.

When the homolateral person moves, the spine, cranial bones, and sacrum do not move together. This results in blocking the circulation of cerebrospinal fluid, which nourish and cool the whole brain from back to front. The homolateral person moves in more rigid or controlled patterns, often without breathing, which inhibits the integration process.

Homolateral learners function mostly from the back brain. This is where incoming sensations are processed, where motor activity generated by these sensations is initiated, and where analysis and storage of experience takes place. Homolateral learners can learn and repeat material, often quite skillfully. In fact, they thrive on the familiarity of automatic or conditioned behavior. However, they usually experience difficulty to fully internalize information).

Bilaterality and integration – the whole brain state

Too much attention and adulation has been given to the right (gestalt) brain hemisphere in recent brain research. The gestalt brain's contribution to information processing and the proper functioning of the autonomic nervous system is undeniable. However, it is not an either/or situation as some learning systems might suggest. The gestalt brain's functions must certainly be recognized and developed for the realization of optimal potential, but the gestalt brain has been given credit for what is actually the work of the integrated brain.

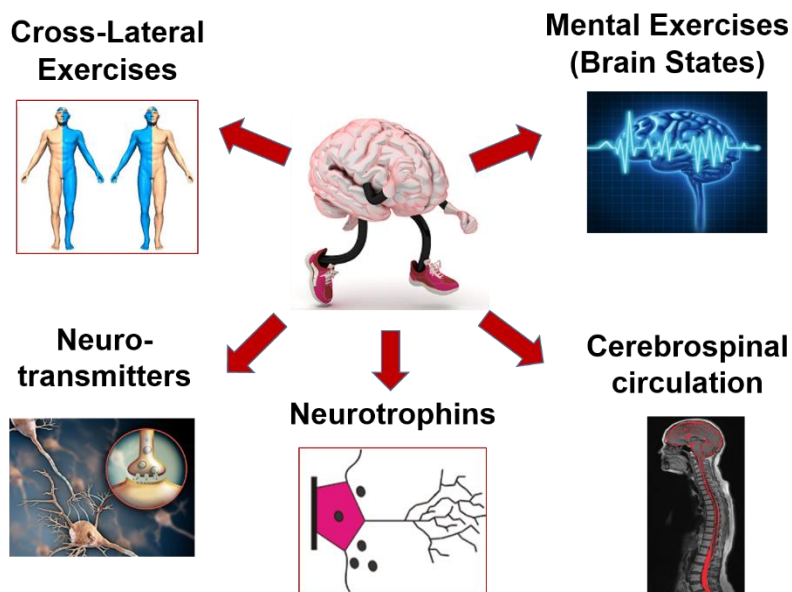
We must remember that the gestalt brain alone is totally passive, receptive only, and without the ability to make discriminative responses and express itself; just as the analytic brain alone can do little more than compare, criticize, and regurgitate information.

What most people have attributed to the right brain, is really the result of back brain/front brain integration which takes place in the Common Integrative Area, a part of the left brain hemisphere. Integrated people express themselves fluently through this language area. No performance, be it reading comprehension, painting, dancing, or any other, can 'belong' to the learner until this level of integration has been achieved.

“The laterally integrated person is able to process information simultaneously, with both hemispheres ‘switched on’ at the same time. He or she can move and think at the same time, read with the writer's hand, speak with the listener's ear, and commit to any task while bringing the whole person to it. In fact, the integrated person thrives

on the new, the spontaneous and the creative. Even the simplest undertaking becomes a joyful opportunity for full self-expression.” – Dr. Paul Dennison

Brain fitness is influenced by 5 factors:



Mental Exercises

The electrical activity of the brain, or the rate of neuron firing, creates rhythmic brainwave pulses that produce different brain states – electrochemical functioning.

Creative intelligence and whole-brain learning depend on different learning states. There are times when an active state is necessary and there are times when we benefit from other states, such as relaxed alertness. As shown in the Brain Wave Rhythms chart, the electrical activity of the brain, or the rate of neuron firing, creates rhythmic brainwave pulses that produce these characteristic states.

Slow neuron firing creates brain-wave pulses that are found in deep, dreamless sleep: the **Delta** cycles. The **Theta** pulse is faster than the Delta pulse and is generally accepted as a sub-conscious sleep state, but can be associated with deep meditation and reverie. It is being researched in connection with deep, creative dreaming and thought.

Alpha brain waves are faster than the Theta waves and are produced when we relax, daydream, use our imagination, learn and think. We often experience this highly suggestible state of consciousness moments before falling asleep and just as we are waking. Accelerated learning techniques have shown that this state is especially important in thinking, learning and processing of information. The fastest brain rhythm, known as the **Beta** state, occurs when neuron firing and thoughts are highly active. This state of the conscious mind is predominant when we are busy talking, moving, and being active. It is a predominantly reactive state for action, performance and implementation.



Optimally we want to function in alpha state. When we are in alpha state we are *relaxed / in the zone / thinking / learning / absorbing information.*

When the left- and right-brain hemispheres are producing similar brainwave patterns, a rhythmic synchronization occurs. This hemispheric integration develops a coordination of rhythms that sets the stage for accelerated listening and learning. Music, movement, and art are especially valuable as integrative tools in synchronizing the two brain hemispheres.

Some exercises:

1. Breathing:
 - Get into a comfortable position
 - Do a diaphragm deep breathing exercise with eyes closed
 - Envision yourself in a relaxing environment
 - Involve all your senses
 - Stay here as long as you like

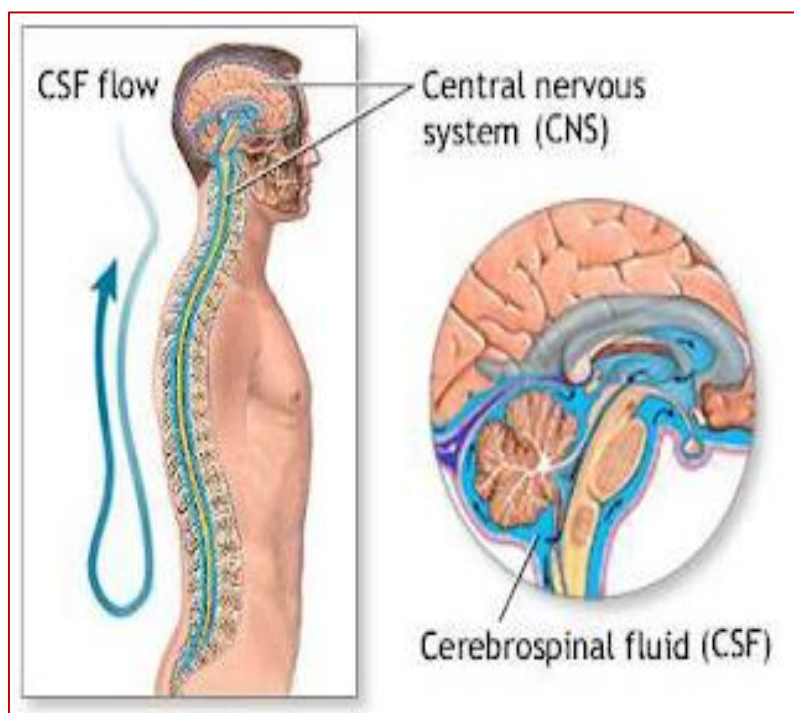
2. Mental Exercise
 - Focus on the left side of your brain and then on your left eye. While your eyes are still closed, look down, then up, then left, then right, then rotate it clockwise, then rotate it counter clockwise.
 - Focus on the right side of your brain and then on your right eye. While your eyes are still closed, look down, then up, then left, then right, then rotate it clockwise, then rotate it counter clockwise.
 - Now relax, keep your eyes closed, and place your palms over your eyes to ease the relaxation for 2 minutes.
 - Keep your eyes closed. Place your attention in the left side of your brain for 10 seconds, then shift to the right side and hold it for 10 seconds.
 - Repeat. Do you notice any differences in feeling, content, or concentration as you shift back and forth between your brain hemispheres? Is one hemisphere easier to focus on than the other?

3. Hook-Ups:
 - Breathe slowly and deeply
 - Release tension in your muscles
 - Lift eyes $\pm 22^\circ - 25^\circ$
 - Recall a positive experience
 - Listen to Baroque music
 - Think of something humorous
 - Hold your forehead lightly until You feel a pulse



Cerebrospinal Fluid Circulation

Stretching / Lengthening exercises increase cerebrospinal circulation which enhances your ability to focus!



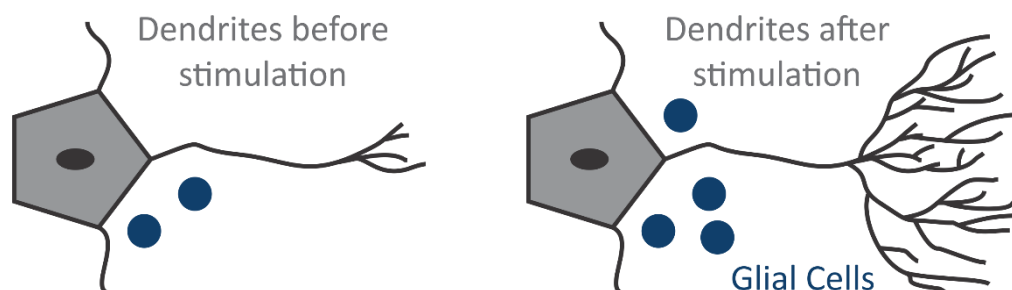
Some exercises:

1. Slow stretches of the limbs
2. Slow stretches of the back
3. Slow stretches of the neck

Neurotrophins

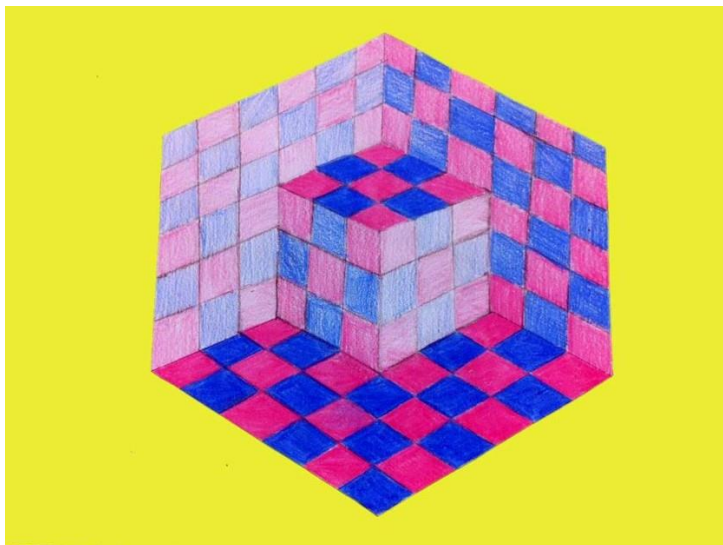
Physical and mental activities produce neurotrophins that:

- activate the brain
- keep the mind flexible
- fight off the negative effects of mental aging



Some exercises:

1. Illusions



Neurotransmitters (electrochemical functioning)

Neurotransmitters which facilitate transmission from one cell to another is considered good fuel.

These neurotransmitters are produced through sensory stimulation, humour and positive experiences.

Some exercises:

1. Watch a humorous video
2. Recall a positive experience
3. Experience nature – what are you seeing, hearing, feeling, smelling or tasting?

Cross-lateral Exercises

Left brain hemisphere controls the right side of the body and vice versa.

Some exercises:

1. Aerobic exercises
2. Swimming
3. Gymnastics
4. Dances
5. Soccer
6. Tennis
7. Doodles
8. Sequenced movements
9. Fingerobics
10. Visual stimulation exercises

Behavior patterns that may indicate lack of integration

- Confused by bilateral activities such as aerobics, gymnastics, dancing and jogging
- Gross motor co-ordination difficulties or hand-eye-co-ordination difficulties
- Clumsiness and awkwardness in throwing and catching a ball
- Excessive activity which seems purposeless, restless, and undirected
- Unusual inactivity characterized by day-dreaming and inner distraction
- Trouble with game playing and following group rules
- Excessive gullibility
- Emotional instability; explosions for no apparent reason
- Tendency to be extremely literal or humorless
- Difficulty to use hands efficiently
- Trouble in matching shapes and sizes: squares, circles, triangles
- Confused sense of time and distance
- Good verbal abilities, but difficulty to read and write
- Difficulty in expressing ideas
- Mechanical reading without comprehension
- Poor or illegible handwriting
- Moves in more rigid or controlled patterns
- Extremely uneven performance in testing; scoring high in some areas and way below normal in others
- Thrives on conditioned or automatic behavior
- Irregular breathing
- May continuously injure themselves
- Moves books and papers out of the midline
- Poor understanding of the difference between up and down, in and out, right and left, front and back
- Confusion in discrimination of letters, words and numbers: 'b' and 'd', 'was' and 'saw', '6' and '9'



Stress

Stress means to lose control. Stress, from a neuroscience perspective means that we **lose control over our non-dominant brain hemisphere**.

Stress, malnutrition, medicine, habitual negativity, fear and dehumanised working environments cause the non-dominant brain hemisphere to radically decrease its function, causing a **“switched off”** state, thus limiting a person’s performance.

The non-dominant brain “switches off” during stress!

When we “switch off”, there is a whole **bio-chemical process** that happens.

You may remember that the name of the stress hormone is Cortisol, and **Cortisol is responsible for the “switching off” process**.

We may be “whole-brained people” and even “brain fit”, but when we experience too much stress we start losing control over the non-dominant side of our brain, which will in turn limit our thinking performance, our learning performance, and it is going to negatively impact how we communicate with people. It will also negatively impact how we relate to others and even how we resolve conflict.

Since the functions of these “switched-off” areas of the brain now become limited to the information processor, the information that was meant to be processed by means of these functions is also lost.

This information loss occurs during everyday life and working situations where **neurological stress** occurs (which can be any formal structured situation where abstract thoughts and competition prevail, such as meetings).

We need to develop good **coping mechanisms** to deal with stress and everyday life. If we do not have good coping skills (no matter how **brain fit** we are) we will “shut down” much quicker.

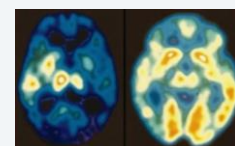
Stress therefore minimises your brain’s fitness levels and that is why we normally refer to stress as the **brain’s greatest enemy**.



Neurological stress is anything that inhibits the speed of electrical transmission between brain cells.

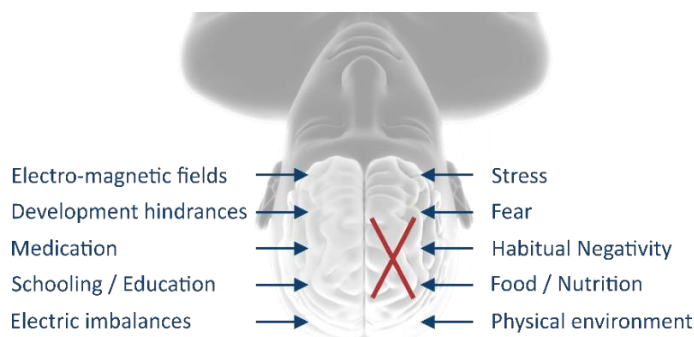


Remember, we discussed how we monitor the electrochemical activity in the brain. We used the following image to explain how the brain “switches off” during stress:



To illustrate the danger of stress, [click here](#) to have a look at the video “Stress, Portrait of a Killer”

Below is an illustration, indicating some of the factors that are considered stressors to our brain:



There are many things in our world that causes us to lose control, most of which we are not even aware of.

When we look at the picture (above) again, on the right-hand side you will see things like **stress** and **fear**. What we need to understand about these stressors is that there may be things that we actually enjoy that may be a stressor to others.

You might enjoy driving fast in a motor car, but this may be something fearful for your passengers driving with you and something that stresses them out.

If we look, for instance at **habitual negativity**; many times, people don't realise that a negative mind elicits a negative limiting bio-chemical response, and therefore they don't realise that their own thinking is actually one of the greatest limitations on their performance. People don't realise that they are actually their own worst enemy.

The good news is (as we have seen so far) that we can change our mind-sets. It may not be easy, but we can change it once we become aware and once we choose to do something about it. In time, these mind-sets can and will change.

It is very important that we need to **become aware** of the **quality of our thinking** and **our state of mind**.

Often people don't think of **food** as a stressor, but a lot of our foods are full of preservatives, flavourants and colourants. Chemicals that may actually sometimes damage brain cells or even kill them. We know that alcohol kills brains cells. Anything that **damages or kills brain cells**, especially when we excessively use them, is a **physical stressor** to the body.

When we look at the physical environment in which we work, we don't always realise that the **electro-magnetic fields** of many of our "tools of the trade" like cell phones, and laptops and Ipads, may negatively impact the electrical fields of your body which will start slowing down the speed of electrical transmission.

We are not suggesting that we are not supposed to use these things (these are the tools of our trade). It is important that if we are not using them, we regularly take breaks from the exposure to these electro-magnetic fields and lights. This will give the energy circuits in our body a chance to rebalance and to re-energise again before we continue.

As 21st Century workers, we may go to work and when we get home we wonder;

Why am I so tired today?

We probably don't realise the impact of noise, lights and cell phones, the heat, our mind-sets and the negative energy of the people whom we work with, and how much that drains us. These things all become stressors to us in our environment.

The 21st century worker has much more stressors than people from a few decades ago. Therefore, we need to be aware of them so that we can learn which stressors drain our energy and then try to manage ourselves in ways where we can avoid some of these stressors as much as possible, so that we are not constantly **drained of our energy**.



Recap on how stress influences the brain

To recap from module 8, people learn through what they see, hear, smell, taste and touch. We have two brain hemispheres; two eyes, two ears and two hands, but we will always have a dominant brain hemisphere, eye, ear and hand.

During **new learning or times of stress**, people will exhibit a preference for either logic/verbal processing, which is more left-brained, or gestalt/creative processing, which is more right-brained. For the **left-hemisphere-dominant** person who prefers to be verbal, analytical, logical and abstract in their thinking, communication will dominate during stress. The **right-hemisphere-dominant** person will be more holistic, non-verbal, creative, intuitive and concrete during stress.

Dominance means it is the brain hemisphere, eye, ear or hand that takes the **leading** role to process information actively.

The other brain hemisphere, eye or ear **follows passively**.

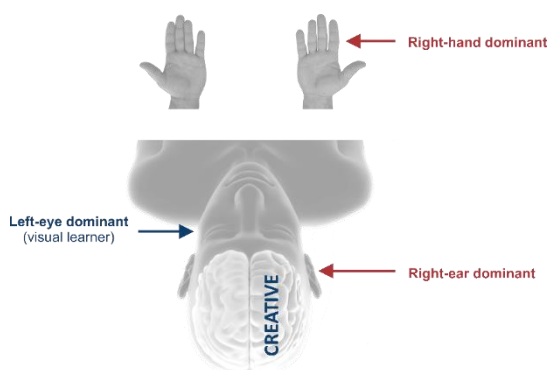
This implies that different people have **different combinations of the dominant** brain, eye, ear and hand and will therefore learn differently.

People naturally choose to use a certain brain hemisphere, eye, ear, hand and foot in preference to the other and then reinforce this with continued and habitual use. This does not necessarily reflect less effective use of the other. Dominance does not indicate competence. Dominance reflects on natural genetically determined preferences.

Competence indicates learned behaviour.

During stress, usually only the dominant senses opposite the dominant hemisphere will be adept at processing information. If the dominant senses are on the same side as the dominant hemisphere, the information processing ability and physical movement functions may become limited.

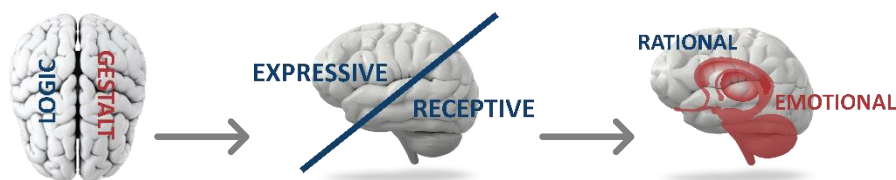
A person's sensory dominance profile will therefore have an important influence on how people learn, on their personality and their particular leadership style.



Remember, we discussed how stress influences the brain in module 6 (How the brain works)

Remember that stress also affects the other lobes of the brain and not just the lateral and sensory preferences.

The switching-off process is illustrated in the picture below:



Stress first causes us to switch-off laterally (left or right), then front or back (expressive or receptive) and then top or bottom (rational or emotional). When this switching-off process goes even further into fight, flight or freeze.

So what can I do to help me cope with stress?

Stress coping

Stress relief – breathing

- Sit or stand in a relaxed position
- Slowly inhale through your nose, counting to five in your head
- Let the air out from your mouth, counting to eight in your head as it leaves your lungs.
- Repeat several times

Guided imagery

- Get into a comfortable position
- Do a diaphragm deep breathing exercise with eyes closed
- Envision yourself in a relaxing environment
- Involve all your senses
- Stay here as long as you like

Progressive muscle relaxation

- Sit or stand in a relaxed position
- Slowly inhale through your nose, counting to five in your head
- Let the air out from your mouth, counting to eight in your head as it leaves your lungs.
- Repeat several times

Pro-active measures to manage stress

- Maintain work – life – sleep balance.
- Be a positive thinker. Challenge yourself. Never lose hope. Choose to be and stay optimistic.

- Strengthen your relationships. Develop as much personal and professional support as possible.
- Maintain a natural, healthy diet. Drink 8 glasses of water per day and increase when stressed.
- Take appropriate supplements.
- Exercise at least 40 minutes daily for at least 5 days a week and walk 3-4 km (2-3 miles) daily.
- Do physical and mental brain fitness exercises to “switch on” all areas of the brain.
- Laugh, laugh and laugh again. Be humorous. Have fun. Enjoy life, work and learning!
- Get a neurotransmitter ‘bath’ by exposing yourself to nature’s images, sounds, odours, textures, tastes and light.
- Take a brisk walk in nature every day.
- Do relaxing activities. Make time for stimulating hobbies. Develop new interests.
- Do breathing exercises 3 times a day – (4 x in, 4 x hold, 4 x out, 4 x hold), yoga or Pilates.
- Listen to Baroque music. Play a musical instrument.
- Practice spirituality. Discover your purpose. Create meaning out of life’s experiences.
- Formulate your vision.

Suggestions to cope with stress

- Maintain work – life – sleep balance.
- Maintain a constructive, optimistic mind-set.
- Strengthen your relationships. Develop as much personal and professional support as possible.
- Maintain a natural, healthy diet. Drink 8 glasses of water daily.
- Take appropriate supplements.
- Exercise at least 40 minutes daily for at least 5 days a week.
- Do physical brain integration exercises to “switch on” all areas of the brain – at least 50 cross-lateral exercises 3 times a day.
- Laugh, laugh and laugh again. Be humorous. Have fun. Enjoy life, work and learning!
- Get a neurotransmitter ‘bath’ by exposing yourself to nature’s natural images, sounds, odours, textures, tastes and light.
- Take a brisk walk in nature every day.
- Do relaxing activities. Make time for stimulating hobbies. Develop new interests.
- Do progressive relaxation exercises before and after work
- Do breathing exercises 3 times a day – (4 x in, 4 x hold, 4 x out).
- Listen to Baroque music. Play a musical instrument if you can.
- Practice spirituality. Live your purpose. Create meaning out of life’s experiences. Live with a clear life vision.
- Do mental integration exercises, like playing chess.
- Do mindfulness exercises daily.



Lack of sleep

Sleep has a major impact on our brain performance. It is one of the primary drivers to optimise your brain's performance.

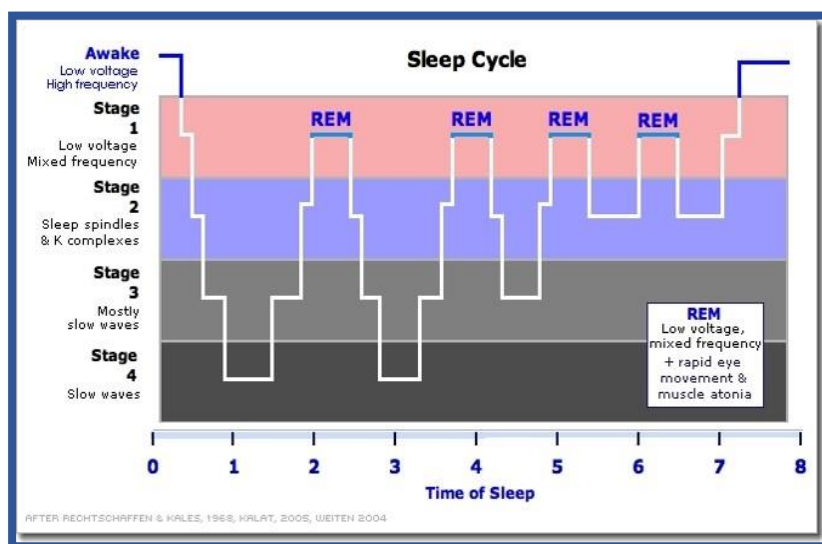
Lack of the presence of this driver in your lifestyle can significantly inhibit your brain's performance.

When we sleep long enough and deep enough, the brain produces vital neurotransmitters that are essential for **happiness and healing**, as those neurotransmitters strengthen the immune system and help the body repair damaged cells.

Sufficient sleep helps the body to **preserve energy** and rests the muscles. It makes the mind more receptive and contributes to **better focus/concentration**.

Dreaming clears away "brain clutter"

Lack of sleep reduces our mental alertness and results in **fatigue**. We will be at risk at work, more prone to accidents and may suffer serious health problems. Although each person needs a different amount of sleep, most individuals need somewhere between 7 – 9 hours of sleep per night. It is not just the amount of sleep we get, but also the quality that determines how rested we will be. The diagram below shows good quality sleep:



Fatigue is a major **inhibiting factor** of brain performance, as it slows down electrical transmission in the brain and may cause people to experience neurological hindrances, depending on their unique dominance combination of brain hemisphere, eye, ear and hand dominance.

When the dominant senses are on the same side as the dominant brain hemisphere, it will cause a neurological hindrance if we are stressed or fatigued.

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NAP Practitioner Training Program

Learning Content Guide

Version: 1.2



Refer to your NAP™ Advanced+ brain profile report.

How is sleep influencing your brain performance?



Fatigue: is extreme tiredness and lack of mental alertness resulting from sleep, mental or physical exertion or illness.



Refer your NAP™ Advanced+ brain profile report.

What is your risk for human errors when you experience fatigue?

How does this impact your performance, productivity, wellness and communication?

Neurological hindrances caused by fatigue, increase our risk for **human error**. The more neurological hindrances we experience, the greater the risk for human errors.

Developing sound sleeping strategies to ensure we maintain quality sleeping habits in a demanding world has become an art that most people have not mastered well enough. Medium to long term it will impact their health, life span, performance, and happiness. Maintaining the discipline of good sleeping habits is not optional but mandatory if mental alertness and safety is a requirement in our world.

How to get a good night's sleep

- Eat lean meat, fish, eggs, soya, spinach, lentils, carrots, sweet potatoes and low fat cheese for Vitamin B6 and Serotonin
- Drink a glass of warm skimmed milk
- ± 1 hour daily sunbreak
- Establish a good sleeping routine – 7,5 hours per night

Sound sleeping strategies

- Develop relaxation habits before you go to bed
- Avoid mental over-stimulation before sleeping time
- Avoid taking worries with you to bed
- Don't stay in bed if you cannot sleep
- Avoid eating a heavy meal 3 hours before bedtime
- Avoid stimulants such as caffeine and alcohol at least 4 hours before bedtime
- Invest in a good quality mattress
- Block out noise
- Block out light. Sleep in total darkness
- Your bedroom must be cool (20-24 degrees Celsius/68-75 degrees Fahrenheit)
- Go to bed before midnight
- Take a 15 – 25 min nap during the early afternoon
- Write a "to-do" list before you go to sleep
- Stimulate your brain as much as possible during the day
- Drink slow release melatonin if you need assistance with sleep, but avoid sleeping pills as far as possible
- Keep your bedroom temperature comfortably cool
- Keep TVs, work materials and computers out of your room
- Develop a sleep routine. Have a consistent sleep schedule to set your internal clock
- Exercise early in the day. Finish 3 hours before bed
- Balance your fluid intake
- Stimulate your brain as much as possible during the day
- Consider using cd's that induce sleep, if needed



Suggestions to sleep better

- Sleep 7 – 9 hours per night
- 4.5 – 5 hours should be a deep dreamless sleep
- An hour before midnight is worth 2 after midnight. Going to bed earlier is better than later
- Your room must be completely quiet
- Your room must be completely dark
- Your room must be cool (20-24 degrees Celsius/68-75 degrees Fahrenheit)
- Develop a sleep routine
- Invest in a good quality mattress
- Do relaxing activities before going to bed
- Avoid taking your worries to bed
- Maintain a healthy diet consisting of natural foods
- Avoid drinking alcohol or caffeine 4 hours before you go to bed
- Finish your meal 3-4 hours before you go to bed



Insufficient movement & exercise

The value of movement is not understood in our world.

Movement is the door to learning.

It is one of the primary drivers to optimise your brain's performance.

Cross-lateral movements **activate different brain regions** and hemispheres and **improve our brain fitness**.

When we move and stretch, we usually increase our oxygen intake. Oxygenated blood, **energizes the brain** and **improves concentration**.

Doing exercise produces neurotransmitters called endorphins that **strengthen our immune system** and make **us feel good**. It also helps with excreting stress hormones.

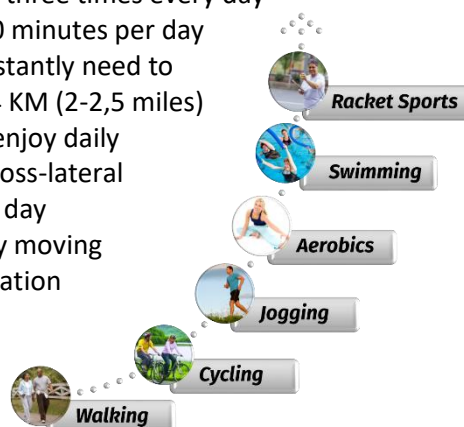
Lack of movement is a major **inhibiting factor** of brain performance as it slows down electrical transmission in the brain and may cause people to work longer, slower and harder due to lack of needed neurotransmitters, resulting in "fogginess".

Most people assume that if they go to the gym every day it is enough, but research suggest we should be moving also throughout the day in order for the brain to really reap the benefits of movement.

Including movement and exercise into our busy life styles, as much as we possibly can, is a prerequisite for a sharp and agile brain. Exercise. Walk where you can. Take the stairs rather than the elevator. Stand during a meeting rather than sitting. Stand when doing computer work.

Suggestions to improve movement & exercise

- Exercise 40-60 minutes per day
- Do stretching exercises at least three times every day
- Do aerobic exercises at least 20 minutes per day
- Except for daily walks, you constantly need to move throughout the day – 3-4 KM (2-2,5 miles)
- Do physical activities that you enjoy daily
- Do 50 or more repetitions of cross-lateral exercises at least three times a day
- Move in rhythms. Dance. Enjoy moving
- Standing increases your information processing ability by 5-20%



Refer to your NAP™ Advanced+ brain profile report.

How is movement influencing your brain performance?

Attitude

“Failure is an opportunity to begin again more intelligently.”
Henry Ford

Do not feed the subconscious with negative beliefs or perceptions!

Your attitude is the way you habitually think. You are what you think. Your performance is the sum total of your thinking. You cannot be more than the sum total of your thinking. A positive attitude is essential for good brain health and optimum performance. Henry Ford said: “Whether you think you can or you can’t, you are right.” Your mind controls your body and whole life. Actions follows thoughts. If you want to change your life, performance, success and happiness, it starts with changing your thinking. A positive mind produces positive performance. A negative mind produces negative performance. A negative mind can never produce positive performance. If you want to be successful, think and do what successful people do. If you want to be happy, think like a happy person and do what happy people do.

Attitude. It is not only your thought patterns that impact your success and performance, but also the bio-chemical response that positive or negative thoughts evoke. Chemicals produced by positive thoughts and feelings complement learning and health. Unfortunately, chemicals produced by constant negative thoughts and feelings, inhibit the effectiveness of electrical transmissions in your brain, drain your energy and may even weaken our immune system in the medium to long term. An optimistic mind-set where a person is governed by a constructive mind is vital for success, brain health and optimum performance.

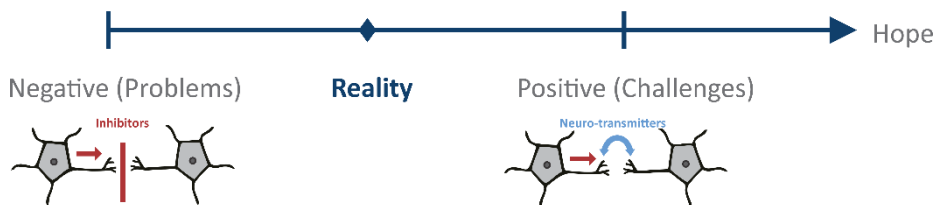
Optimism

Pessimist

(fearful)

Optimist

(hopeful)



Contrary to popular belief, you are not born being an optimist or a pessimist. Optimism is a habitual, positive mind-set of someone who always have hope for the future. A positive mind is a mental discipline you develop and maintain. Your mind-set is an attitude you develop and something you are responsible for. You should



Attitude is the way you habitually think.

Mind-set refers to your conditioned thinking – what your mind is set on in general.

control it. Your mind-set should never control you. Maintaining a positive attitude is of primary importance as it is the underlying mind-set for most desired skills like creativity, problem solving and emotional intelligence. You can eat healthy, do your brain fitness and movement exercises, but if you have a negative mind, it will still limit your brain performance profoundly.

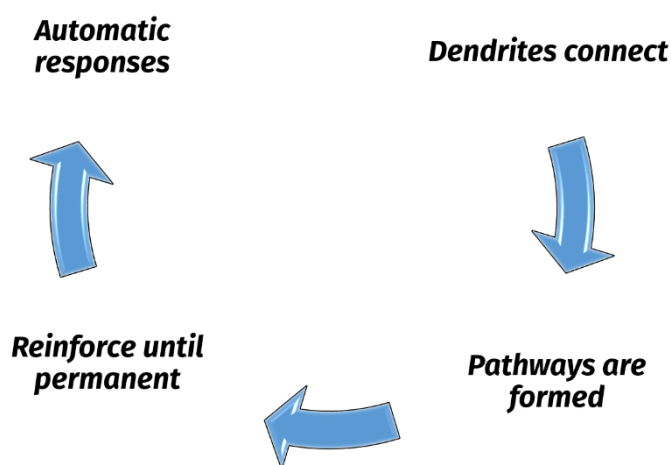
Your previous brain programming for doing the tasks that you fear or tend to evade, plays a major role in how you handle the particular situation now. You therefore need a great deal of advanced positive brain programming. What you imprint into your subconscious and believe is linked directly to what happens in your life. Do not accept any limitations about yourself. Break with limiting mind-sets!

Thoughts that are often repeated form patterns and in future it is easier for the brain to keep on using the same pathway, especially when you are under stress. Therefore, create positive pathways in advance.

The tenser you are the less you can control your brain, the less your brain is working for you and the more difficult it is for you to re-pattern yourself positively. Relaxation is therefore conducive to positive brain programming and better achievement.

You need not believe what you say when you give yourself positive messages. You merely need to consistently repeat the messages for 42 days, 5 minutes every day. The pathways will form and you will get results. Look at an example from your own life. We all have been programming ourselves, sometimes for years, which we are unable to do something, yet this may not be true at all.

If you make use of visualization in your positive brain programming, e.g. visualizing your outcome or “practicing” in your mind, you will get even better results. When you visualize yourself doing something step by step, the connections between the brain cells are physically formed and you have created a physical pathway to success.



This kind of brain programming through visualization works best when you are relaxed. If you do not have the time to do a proper relaxation exercise rather, breathe in deeply for two minutes and feel yourself breathing out your tension or

worries. Relax your shoulders and facial muscles, scan your body for any tension in the muscles, and relax those muscles.

We are constantly talking to ourselves every second of our waking lives. It has been postulated that we speak to ourselves at a rate of 1 200 words a minute.

Be that as it may, it is rather startling to realize how we are constantly programming ourselves, often in a negative manner. Mostly we are not even aware of what we say to ourselves. It is even more frightening to realize that everything we say to ourselves is transformed by an area in the hypothalamus into neuropeptides which are sent out to every cell in the body and thus we Programme ourselves every day, all day, probably without even realizing what we are saying to ourselves or the immensity of the consequences. So, perhaps you need to change your self-talk. In order to do that you first have to start listening to what you say to yourself. If you find yourself saying negative things, like “I can’t...”, “I will never be able to...”, “I am going to fail”, etc., you should change to a positive statement: “I can...”, “I have already started on my path to success.”

Note that you should always make a positive statement e.g. if you hear yourself saying “I’m afraid...” don’t change it to “I’m not afraid.” What does “not afraid” mean? What does it look like? Rather say “I’m confident.”

If you find yourself making a future statement “I’m going to...” change it to present tense: “Now I’m reaching my goal” or to past tense: “I have already started to be more confident.”

Positive brain programming always works better when you are relaxed, since you then have much more control over yourself.

“Whether you think you can or you can’t, you are right.”
Henry Ford

Positive re-patterning technique

- Do a thorough, honest self-evaluation
- Make a decision to change
- Energise your brain and prepare your neurological system for utilization
- Lift the eyes $\pm 22^\circ - 25^\circ$ to activate Alpha state
- Now instruct yourself to change to the positive. Be brief, forceful and rhythmic. Make it a now statement. **Say it verbally.**
- Seeing is believing: visualize the positive thought repeatedly. **See it.**
- The proof of the pudding lies in the eating: experience the positive thought repeatedly or act out what you would like to happen. **Do it.**
- Ignore contradictory thoughts. **Believe it.**



- Repeat this technique 3 times per day for a period of 42 days. This will serve as proper reinforcement for the re-patterning process
- Ensure that you do not focus electrochemical activity (by thinking) in the old negative brain patterns that you wish to change
- Believe you are capable of doing anything

Positive re-patterning technique

- Be hopeful of the future. Create clear vision
- Choose to find purpose and meaning in every situation
- Choose to think more positive than negative thoughts. Practice possibility thinking. Maintain a growth mind-set
- Contemplate the things you are thankful for daily
- Spend time with positive, uplifting people who inspire you
- Challenge yourself. Constantly expose yourself to new experiences. Growth happens outside your comfort zones
- Interact with others in constructive and supportive ways
- Focus on what you like more, than what you don't like
- Seek counsel and support from others when you feel stuck
- Feed your mind with positive, constructive information



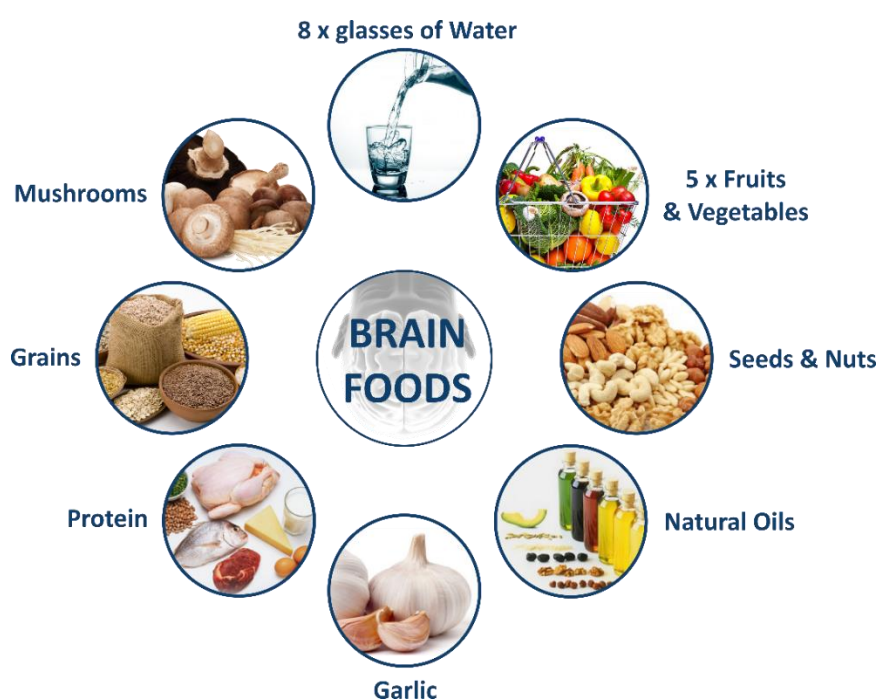
Brain food

Your life style and the food you eat have a direct influence on your information processing ability, emotions, health, concentration and how your brain performs. The energy your brain produces comes from a combination of the food you eat, the water you drink and the oxygen you inhale.

Your brain needs the energy produced from glucose for the transmission of messages around its billions of cells and to the rest of your body. Each message flows around your body electrically and chemically, and it keeps switching from one form to the other. Your brain needs the right type of energy to produce those chemical flows, which scientists call neurotransmitters.

Scientists have identified \pm 70 different types of neurotransmitters, and as Brian and Roberta Morgan point out in their excellent book BRAIN FOOD: “Any deficiencies in nutrients can reduce the levels of certain neurotransmitters and so adversely affect the types of behavior they are responsible for. Conversely, a physical or mental problem can be corrected by boosting the level of the relevant transmitter and this can be done by making a simple alteration in the composition of your diet.”

Eating natural and healthy brain foods compliment working faster and smarter. Most of nature’s produce, used in moderation, will be conducive for increased mental performance. Unfortunately, most of man’s “quick fixes” and products like processed and fast foods are not always conducive to physical and mental performance and health in the medium to long term. Maintaining a healthy, brain friendly diet for people who are on the go, may be their greatest challenge, but something that significantly influence their energy, life span, well-being, performance and happiness.



Vitamin B6: Manufactures Neurotransmitters

The brain also needs a constant supply of other nutrients. Among the main ones are sodium and potassium. Each of your 100 billion neurons has up to one million sodium pumps, and they are vital for transmitting all your brain's messages. Sodium and potassium supply those pumps with energy. Like glucose, potassium is found mainly in fruit and vegetables and sodium is found in most foods. If you reduce your sodium intake you reduce the movement of electrical currents around your brain which reduces the amount of information the brain can receive. If you drastically reduce your intake of potassium you risk anorexia, nausea, vomiting, drowsiness and stupor. All of these could be symptoms of your brain's vital pumps not working.

An iron deficiency is one of the most important causes of poor mental performance in Western society. An iron deficiency decreases attention span, delays the development of understanding and reasoning powers, impairs learning and memory and generally interferes with a child's performance in school. Iron is found in green vegetables, that is why they are so important in your diet. There is not one single food that contains all the different supplements that the body needs. Therefore it is necessary that a diet must consist of a variety of foods.

Vitamins B3, B6, B12: Helps with effective concentration & stress management

We are born with roughly 100 billion neurons. By establishing connections between neurons, or making new synapses, the brain increases its mass threefold until the early twenties. From that time on, the brain decreases in weight by 1 gram each year. This drop in weight is the result of losing, naturally and inevitably, **± 15 000 neurons each day** of our lives.

Proportionately more are lost in the frontal and temporal cortex, especially the motor cortex, which contains the long axons from the spine necessary for balance. Alcohol consumption increases the daily destruction proportionally to the quantity consumed (around 10,000 neurons per day for a heavy drinker or alcoholic). Sick, medication and untold other assailants can also increase the rate of neuron loss.

Important aspects to keep in mind

1. Eat a good breakfast every morning, preferably with plenty of fresh fruit. Include half a banana for its potassium content – and a whole one if you're pregnant – with an orange or kiwi fruit for vitamin C and any other fresh fruit in season. If you have children make sure they do too.
2. Eat a good lunch, preferably including a fresh vegetable salad.
3. Make fish, nuts and vegetable "fats" key part of your diet. Fish and vegetable oils have a vital role in nourishing the brain's billions of glial cells. Nuts and vegetable Oils are major sources of linoleic acid, which the brain needs to repair the myelin insulation around your brain's "message tracks."



4. For mental enhancement and memory improvement the following natural products can be obtained from most health food stores:
- Gingko (Gingko biloba)
 - Phosphatidyl Choline
 - Phosphatidylserine

Perhaps the biggest culprit in our environment, when it comes to energy blockage, is processed food. Although much can be said about the importance of a natural diet, it is not the aim to endorse anyone's diet and no one but a licensed doctor or professional may prescribe a diet.

Remember: With moderate usage, most foods can be eaten without serious energy blockages. There is not one single food that contains all the different supplements that the body needs. Therefore a diet must consist of a variety of foods.

Water

The body's **electrical system** depends on an efficient conductor – water plus either sodium chloride (salt) or potassium chloride salts to conduct electrical messages in the body. These charged particles carry electrical impulses along the neuronal pathways. The cell membrane has positively charged particles on the outside and negatively charged particles on the inside. When an impulse is sent from the brain to the cell, positive ions go to the inside, and the cell is depolarized.

Instantaneously, this is followed by outward movement of potassium and the neuron is repolarized. Then the pump restores the sodium and potassium to the outside and inside of the cell, respectively. This creates a wave of depolarization and repolarization along the pathway, sending electrical impulses along the axon of the neuron to the transmitter substances at the synapse of the input area (whether it be muscle, blood vessel, etc.). This causes the transmitter substances to depolarize through action (muscle contraction, secretion, etc.)

Research by Dr. George Kriegl, M.D., who studied soldiers in the 1930's and 40's found that as malnutrition set in, the polarity in their membranes decreased. Kriegl determined that the health of the whole system depends on the polarity across the membrane. In another study, Sporansky inhibited the polarity in the neuron and noted that this caused the system to break down, scavenger bacteria to come in and disease to begin.

Water is the ionization we need for polarization to occur. Water is the “magic solvent” for charged particles that conduct the impulse of information across the axons. Pulling a hair taut stimulates the neurons. If the body is not hydrated, lacking water, cellular polarity will not occur and information will not travel along the neuronal axon. Hemoglobin, the iron-rich protein pigment in red blood cells, ferries oxygen throughout the body. Despite intensive study hemoglobin still baffles scientists because it grabs on to oxygen in the lungs more readily than its molecular structure would suggest. Now three biophysicists have discovered that water whets hemoglobin's appetite for this vital gas. In experiments at the National Institute of Diabetes and Digestive and Kidney Diseases in Bethesda Md., the researchers found that at least 60 water molecules latch on to a hemoglobin molecule as it takes up oxygen in the lungs. The water sops up energy that otherwise makes hemoglobin rebuff oxygen. Thus other oxygen molecules can attach more easily. He says this whetting seems to cause the hemoglobin to relax



Have a look at module 5 –
Brain basics



and open up, increasing the protein's affinity for oxygen by a factor of 100 to 1000.
(Science news. Vol. 139 – March 30, 1991)

- Dehydration leads to poor mental & physical performance
- Constitutes \pm 75% of total body weight
- Facilitates electrical transmission
- Detoxifying agent
- Increases concentration
- Energizes the brain
 - increases oxygen intake

Suggestions to improve your brain friendly diet

- Drink 8 glasses of water per day
- Eat 5 portions of salads, fresh fruits and vegetables daily
- Eat more white meats like fish and chicken (without the skin) and less red meat
- Take natural supplements daily to complement your diet
- Reduce or avoid processed and fast foods
- Reduce alcohol, caffeine, nicotine and too much sugar and salt intakes
- Avoid flavourants and colorants
- Eat less but smarter
- Keep in mind: variation and moderation



Cognitive skills

In the world of information explosion, 21st century learners and thinkers need cognitive skill sets that will help them to efficiently and fast absorb, retain and express information.

Except for regulating basic cognitive skills bodily functions, learning and thinking are the primary functions of your brain. You are born with unique learning and thinking potential but need to develop appropriate cognitive skills that are aligned with your unique neuro-design to be good at creativity, analytical thinking and complex problem solving.

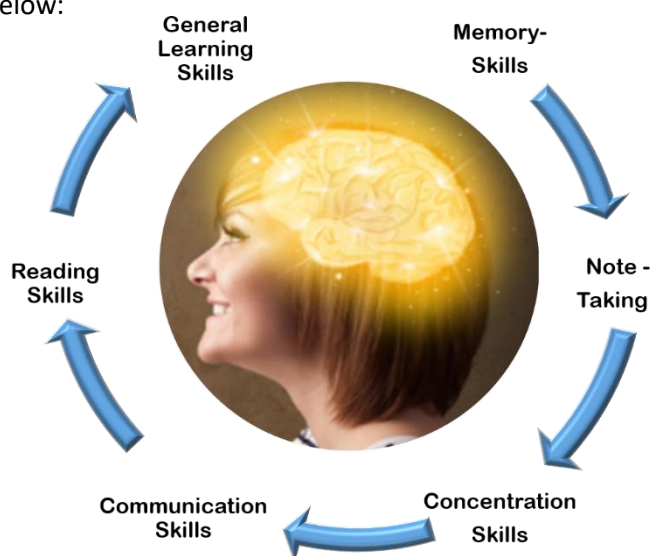
In order to optimize your brain performance, you also need to learn mental skills required for the 21st century to survive and thrive. Skills like advanced visual processing skills to read faster and process volumes of information effectively, how to reduce volumes of information (data) to meaningful content, complex problem-solving skills, critical thinking skills, creativity, emotional intelligence, judgement and decision making and cognitive flexibility will be a necessity.

People's learning agility and neuro-agility will determine how fast, easy and flexible they can learn new information, apply previous experiences to new change situations and adapt and adjust to new systems, strategies and structures.

Cognitive skillsets like neuro-agility, learning-agility, complex problem solving, creativity and effective decision making will be crucial to all humans if we want to be competitive with artificial intelligence. Added to that, having a reading speed of a thousand words per minute, concentrating effectively, and retain information sufficiently is mandatory.

People's brain fitness to out-think, out-learn and out-create any competition, which includes artificial intelligence, will be vital for survival and progress

Learning skills measured in the Toolbox and Student Performer Brain Profiles are illustrated below:



Suggestions to improve cognitive skills

- Develop most desired brain power skills:
 - neuro-agility
 - complex problem solving skills
 - critical thinking skills
 - creativity
 - cognitive flexibility
 - decision making skills
- Emotional intelligence skill set
- Whole brain learning skills
- Advanced reading skills



Brain Ergonomics

Another major influencer on our performance is our environment. It is called brain ergonomics.

Brain Ergonomics is the specific domain of ergonomics that deals with aligning the environment with how the brain naturally functions.

Brain Ergonomics is a practical approach to **humanise the environment**, improve learning, thinking and creativity to optimise performance and productivity.

The following elements in our environment, impact our brain:



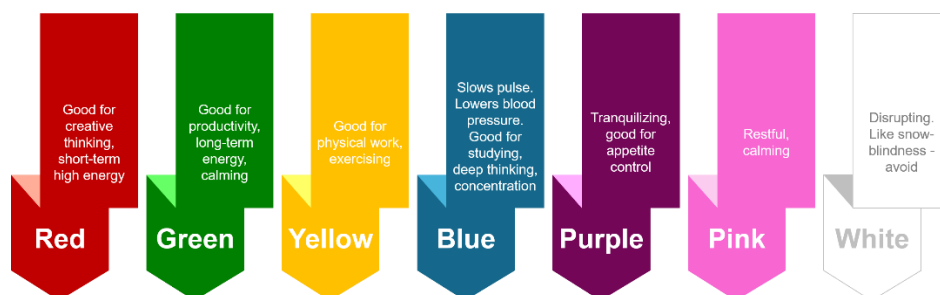
Every impulse we receive and process through our senses, triggers either a facilitating (good fuel) or inhibiting (bad fuel) bio-chemical response. Let us look at each of these influences on our brain's performance in more detail. . .



*Ergonomics is the study of how to adapt the environment to people. It's sometimes referred to as **human-factors engineering**.*

*The whole idea is to make the environment more user-friendly for people, to **eliminate harmful stress** on their bodies.*

Brain Ergonomics - Colour



The colours that we see, have a physiological impact on how we experience the world around us. We are positively and negatively influenced by colour.

*For instance; the colour **RED**, is always good for creative thinking or to elicit high energy. It can also emphasise a certain message.*

***GREEN** is normally good for productivity, for long term energy and it has a calming effect.*

Just look outside for a moment, or think about lying on green grass or under trees and looking up at the clear blue sky ... How does that make you feel?

It seems that black, white and grey are the least preferred colours for the human mind. Just think how many times black, white and grey dominate corporate environments and the environments in which we learn. We are often expected to learn, think and perform well in environments that are not humanised (not conducive for brain functioning).

Over 90% of all information that enters our brain is visual. The retina accounts for 40% of all nerve fibers connected to the brain. Our eyes register 600 visual messages per second. Advantage needs to be taken of the brain's enormous capacity for visual processing and learning.

The essential elements for visual learning are contrast between light and darkness, color, line ends, curvature and size. These are perceived before a person actually understands what was seen. Powerful visuals attract, stimulate and keep a person's attention.

People remember colour first. It is part of the spectrum of electromagnetic radiation. Every colour has a wavelength. Every wavelength, from ultraviolet (blue) to infrared (red), affects our brain differently. Color affects people's moods, their performance and their learning abilities. Color can have different effects on people, depending on:

- Their personality
- Their state of mind (e.g. if a person is highly anxious or stressed, red can trigger engagement with negative emotions).



The following video beautifully illustrates the power of colour, and how colour is used in branding in the corporate world to elicit an emotional response. [Click here](#) to view the video.



Graphical designs and shapes have a similar impact as colour.

Color can affect our moods. We find some colors uplifting and inspiring, and others depressing. We often use expressions such as ‘feeling blue’, ‘yellow-bellied’, ‘green with envy’, and ‘seeing red’, without thinking of the meaning behind the words.

Our feelings and emotions are directly affected by the balance or imbalance of hormones in the body; since our hormones are affected by color, it is certain that color will have a marked influence on our moods and feelings. Certain colors can calm our minds, while others stimulate mental activity. By restoring a balance of energy flow to the pituitary gland, metabolic and emotional equilibrium can be restored. This can alleviate stress, tension, anxiety and depression. Certain colors can help us deal with feelings of loneliness, frustration and grief.

Using color to alter emotional energy also results in changed perceptions of the world, and our experience of it. Since color directly links to the subconscious mind, we can use it to diagnose and treat problems at a deep level.

Practical Applications:

- Use color coding for labelling items like files, etc.
- Use color cues rather than verbal cues
- Use videos, posters, mind maps, vivid drawings, symbols, business logos and powerful statements on walls
- Use more motion in visuals
- Change the location of your visuals every six weeks
- Use more illustrations and demonstrations than verbal instructions
- Use more color in e-mails, hand-outs, reports, books, power point presentations and peripherals against walls
- Use primary colors (blue, yellow and red) often
- White, grey and black are the colors least preferred by the brain and should be used sparingly
- Light pastel colors can be used for most environments
- Using too much white can be disrupting
- Attract the brain with contrast and color changes
- Play videos of nature’s images (like an aquarium, a fire burning, waterfalls, etc.)

Red	Good for creative thinking; short-term high energy
Green	Good for productivity; long-term energy; calming
Yellow, orange	Conducive to physical work, exercise; elicits positive moods
Blue	Slows pulse and lowers blood pressure; conducive to studying, deep thinking, concentration; accent with red for keener insights.
Purple	Tranquillizing; good for appetite control
Pink	Restful; calming
Light colors	All-purpose; provide minimum disruption across all moods and mental activity
White	Disrupting, like snow-blindness – avoid



Brain Ergonomics - Plants

Plants produce oxygen and are nature's air filters.

They also positively impact the ionization of air particles that improve your concentration.



Practical Applications:

- Encourage people to breathe in more deeply.
- Fill learning environments and work areas with plants: 4 to 8 small plants or 2 large plants for every 900 square feet.
- Some of the best plants are: Gerbera Daisies, Yellow Chrysanthemums, Ficus Benjamina, Philodendrons, Dracaena Deremensis, Peace Lilies and various Bamboo Palms.
- Ensure that the plants are potted in attractive, colorful pots.
- Ensure that plants are positioned in such a way that they receive sufficient light and are not affected by air conditioners.



Are you surrounded by plants in your work space and your living environment at home?

Brain Ergonomics - Lighting

It is not only colour that is important to the brain, but **lighting** as well.

People may be under-performing simply because the lighting is difficult on their eyes. Light affects moods and alertness because it shuts down the production of Melatonin, the sleep inducer. Never work or learn in a poorly lit room! This will result in feeling tired and listless. Full-spectrum lights are best. Most lights are concentrated in the wrong part of the spectrum (orange-violet-red). However, blue-green is the most vital part.

Absence of this part of the spectrum leads to measurable fatigue and eyestrain and thus to poor productivity or performance. The positive impact of a quality working environment with strong natural lighting is both dramatic and lasting. Ensure adequate lighting in your environment.

Research suggests that our brain has a very **positive response to yellow lighting** (what natural daylight looks like), but a more **negative response towards white/florescent lighting** (often used in the workplace) as it reflects on white paper and into the eyes, causing visual fatigue.

Research suggests that lightbulbs with a colour rendering index of 90 or higher, seem to have a positive impact on our performance. Some studies indicate it may even decrease visual problems in learning environments as much as 65%.

Other studies indicate that yellow lighting decreases fatigue with 55% and infections with 43%.



It is therefore essential to consider lighting when we work and even in our living environment, as it may have a positive or negative **impact on our neurotransmitter production**.

Full-spectrum lights should be part of the fixtures, and incandescent bulbs with a Color-Rendering Index (**CRI**) of 90 or higher should preferably be used. The higher the ceiling the better, as this will prevent the artificial lightning's electromagnetic fields from interfering with the body's energy fields. The brightness of daylight affects our body's Melatonin and hormone levels and influences the release of neurotransmitters. Light deprivation does not only affect performance, but may also lead to depression.



Yellow light on the other hand, is less reflective, and for instance; helps to reduce depression.



Practical Applications:

- Provide a variety of lighting in the work or learning environment.
- Provide people with a choice of where they want to sit.
- Use off-white or light pastel colored paper.
- After lights were dimmed (like after watching a movie), plan a break or activity to rest your eyes.
- Provide extra lighting for people who work or study at night.
- Improve lighting during periods of low sunlight.
- If you are trying to sleep during day time, ensure total darkness. You can use blindfolds and black window shades, if necessary. Earplugs can also be helpful. The new foam rubber plugs are form-fitting, comfortable and unnoticeable.
- Learning environments, work areas, break areas and restrooms should all be especially well lit if you are working or studying at night.



Brain Ergonomics - Peripherals, shapes and designs

All humans benefit from a visually enriched environment. Peripherals like mirrors, colorful carpets, artwork, games, values and ethics, posters with positive messages, color-coded professional messages, inspiring quotations, learner work and symbols of expression, change, growth or beauty can be powerful decorations for creating a happy, pleasant environment.



Visuals or artwork hanging on the walls should be rotated and repositioned on a regular basis. This activity stimulates the brain and draws attention to the visuals from a renewed perspective. The shapes and designs of the visuals should incorporate both brain hemispheric preferences (i.e. shapes and shades for the right hemisphere and lines and symmetry for the left hemisphere). Research shows that peripherals create effortless, subject-specific, **longer-lasting recall**.

Practical Applications:

- Recommended height for visuals: minimum height 120 cm and maximum height 150 cm.
- Consult others to determine the practicality of your ideas for using peripherals, shapes and designs.
- Create a purposeful 'peripherals' plan to positively influence yourself and others.
- Provide a budget for artwork and allow others to participate in making selections.
- Make sure the furniture is arranged in such a way that you can see others, which usually provides the most interesting visual enhancement of all.
- Use 3 to 5 charts, visuals or posters per room at any one time for optimal results.
- Posters or visuals should be rotated at least every six weeks. Flexi-rails can ensure the movability of posters or visuals in order to continuously stimulate the brain.

Ensure that appropriate visuals are present in break areas.

Brain Ergonomics - Sounds

The brain responds to organized and unorganized sounds – the first we call music, the second noise. Environmental noise alters the processing ability of the brain, decreases productivity and has a negative influence on health in general. As a rule, no unrecognized noise should be present in any learning, thinking or working environment. Noise can be a huge hindrance in the mind of a mental worker or learner – from conversation to clocking equipment, from dripping water to occasional footsteps.

Research indicates that so-called **White Noise**, a low-pitched sustained noise of low volume, serves to mask all other noises. Such an effect can be created by a refrigerator, air conditioner, or fluorescent light fixtures. White Noise can be very boring to listen to. Advanced sound-harmonic technologies have been developed to increase people's mental performance. Computer-generated, pure tones of various frequencies are covered or 'quilted' with more pleasant sounds, which increase mental performance.

There are different versions of White Noise. **Blue Mist** is a version where the irritating 'hissing' sound has been modified to make it more pleasant to the human ear. This is used mainly to assist people reach a state of focused concentration and absorb information, thereby increasing learning. Listening to sounds of nature (like sea waves, wind or a millstream) assists people in entering an Alpha brain state.

Another variation of White Noise is **Pink Fog**. It is a slightly lower-pitched, more rounded form of **Blue Mist** and is used to accompany the Theta brain state for deep, creative thought and new insights. These tools mentally energize people, produce creativity, and put their brains into a state of mental productivity. Sound can certainly be a key to using your brain more effectively.

It is not only about what we see, it is also about the sounds we are exposed to. Research suggests that whenever we hear **soothing nature sounds** like that;

- of a millstream, or flowing water,
- of the ocean waves,
- of birds chirping in a tree,
- of the rain falling on the roof,
- or the sound of a fire crackling,
- or even some animal sounds, like for instance; whale and dolphin calls or a cat purring; it has a relaxing or calming effect on people, because it seems to put our brains into **Alpha state**, which is a relaxed state of mind.

Obviously when people enjoy the sounds they hear, it is not just calming them down and putting them in a "receptive state", it also helps them to produce vital neurotransmitters.

Just close your eyes for a minute, and listen to the sound of a river flowing. . . [play sound]



Remember - although nature's sounds and music can have a positive effect on our brain's performance, the opposite is also true.

Loud and disruptive sound/music can have a distracting and negative effect on our brain's performance as well.



You can listen to the sound of a millstream by [clicking here](#).



Did you notice how that made you feel when you listened to that for a while?

The idea here is, that whenever we need to relax or we want to feel calm, we use the sound of water (or whatever sounds from nature) to calm us down and relax us, so that our brain can be in this **receptive state** to perform as best as it possibly can.

Remember that Alpha state is also our state of **mental integration**, where there is harmony in our brain wave rhythms on both the left and the right sides of the brain. Sounds like water, birds chirping, ocean waves and so forth, definitely **contribute to activating Alpha state**.

Music is also a very powerful inducer of Alpha brain wave rhythms.

Music can have a very positive effect on people. The depth and variety of that effect is still being discovered. Research shows that:

Research tells us that the following are benefits of music:

- Increases physical energy
- Reduces pain
- Speeds up healing
- Releases emotional tension
- Stimulates creativity
- Stimulates hemispheric integration

The type of music which compliments relaxation and encourages your brain to activate Alpha state, is Baroque music. Music from the likes of Vivaldi, Bach, Mozart, Handel and Corelli don't include a human voice, nor drums.

Human voices and drums tend to take us towards **Beta state**, whilst string instruments and a slow tone of 60 beats per second calms us down, gets us into the "zone" and activates Alpha state.

Some studies suggest that your brain can absorb 5 x more information in Alpha state than in any other state of mind. Therefore, baroque music and the sounds of nature, beautifully compliments brain functioning. Music is a powerful tool to use to optimise brain performance.

Practical Application:

- Consult with an acoustical engineer about the best way to mask noises that represent potential distractions.
- Obtain **White Noise** sound tools like **Blue Mist** and Pink Fog from Neuro-Link.
- Where applicable, use **Baroque** music for learning.
- Install speakers with volume control in every office and training room.
- Radio and popular music can be used in break areas and areas where people perform physical tasks. However, it has to be played softly.



Nowadays, we even get Baroque music combined with the sounds of nature, and they beautifully impact the brain's performance, calming us down, yet increasing our ability to absorb more information.



- Classical composers (e.g. Mozart, Haydn and Beethoven) and mid-to-late Baroque composers (e.g. Vivaldi, Scarlatti, Handel and Corelli) tend to offend the fewest listeners.



Brain ergonomics - Ergonomics

Ergonomics refers to the tools we use, the tables we sit at, the chairs we sit on, etc.

Are the tools we use brain friendly?

What do they feel like – do they resemble natural textures, like wood and leather rather than plastic and polystyrene?

Are the chairs adjustable and do we have proper lumbar and arm support?

When we work on the computer, is it at the right height?

Is the right light available? . . . etc.

The impact of ergonomics is huge on our performance in the workplace.

People don't always notice how de-humanised their workspaces are and how negatively it impacts on their brain's performance.

We can't expect people to perform in an environment in which they are supposed to learn and think and even operate dangerous machinery, if it is not conducive for thinking and learning and even relaxation.



Research shows that at least 20% of people are significantly affected (positively or negatively) by the type of seating options available. The chairs that people sit on are in most cases not acceptable, both from a posture and a breathing perspective.

Many of the people, who are having difficulty with their posture, are sitting in a slumped-over position, getting insufficient oxygen and blood flow to the brain. The brain is starved of oxygen, since deep breathing is not possible in a slumped-over position.

The correct flow of cerebrospinal fluid is essential for cooling down the brain, and chairs with poor lumbar support can impair this flow. Needless to say, productivity and performance will decrease if people are uncomfortable in the seats they



*Ergonomics is the study of how to adapt the environment to people. It's sometimes referred to as **human-factors engineering**.*



Research shows that at least 20% of people are significantly affected (positively or negatively) based on just the type of seating options they are provided with.



occupy for hours per day. Even serious medical problems like spinal and shoulder injuries may arise, as well as the very definite hampering of motivation, productivity and performance.

Practical Applications:

- Comfortable, adjustable chairs with proper lumbar support effectively cater for people of any height in that they can adjust these chairs to improve their posture.
- Tables/desks must be mobile, easy to arrange and allow enough legroom.
- Chairs should preferably be mobile and have armrests, height and lumbar adjustment.

Proxemics

Proxemics is the study of how people physically **distance themselves** from others.

Research shows that:

- Generally, women are more comfortable at close distances from other women, whereas men are more comfortable at greater distances from other men.
- The smaller the enclosed space, the further people will want to sit or stand from each other. The larger the enclosed space, the closer they will choose to sit or stand from each other.
- When two people stand face-to-face, they communicate that they like each other. As the imaginary angle between them increases through a right angle to 180 degrees, less liking is communicated.
- The closer two people stand to one another, the more they communicate mutual liking.
- Cultural differences exist concerning comfortable distances and gazing patterns. If people from a different culture to yours appear to be standing further or closer than is comfortable for you, the chances are that it is more comfortable for them. If you adjust the space between you, they will immediately return to the previous distance.
- When people re-enter a room after a break, encourage them to take different seats. This change of perspective yields new insights.

Room and office arrangements

Take into account the preferences of people with different **temperaments**. Rooms should accommodate the needs of people who prefer:

- Space for more books and artwork
- More action-oriented pictures and objects (e.g. cars, airplanes, horses)
- Space for computers and other data sources
- To have an area set aside for group meetings (a round table or corner sofa)
- Lots of surface space for all their piles



- Space for elaborate storage equipment – staying organized is vital
- Enough space for eye contact; areas with windows, open offices, and low walls
- To close the door and isolate themselves for extended periods of time
- Change from time to time

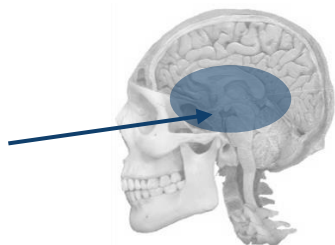
Practical Applications:

- Generally, men require a larger working space than women.
- In small offices, meeting rooms, or waiting areas, place chairs and sofas as far as possible apart to give people more space. Using wider chairs accomplishes a similar purpose.
- When you desire to communicate explicitly to people that you like them (for instance, in a performance appraisal, sales call or oral examination), stand or sit face-to-face at a minimal comfortable distance with moderate eye contact. Avoid either staring them down or excessively gazing away (e.g. looking out the window).

If a person of the opposite sex is coming on to you in an unwanted manner, try using the three nonverbal sexuality communicators of the opposite sex: a woman, for example, to 'turn off' a man, would stand with feet planted parallel, arms crossed, and pelvis rotated forward.

Brain Ergonomics – Odours

Smell is directly linked to the sub-conscious mind. If we look at the brain, the sub-conscious mind is located here:



Through the nose, we are directly linked to this system where the sub-conscious mind resides.

The **pituitary gland**, is triggered whenever we are exposed to floral odours, fruit odours, or any other **natural odour** and has a very **positive effect** on neurotransmitter production.

When we are exposed to very **artificial sharp smells**, for instance; the smell of burning tyres or plastic, sharp ammoniac/chemical smells (like one gets in a paint shop or the motor manufacturing industry), this has a very **negative impact** on your brain's performance.

Therefore, smelling something pleasant means that we are producing sufficient neurotransmitters; whereas, smelling something unpleasant, means we are producing chemicals that may negatively impact memory, electrical transmission and even concentration.

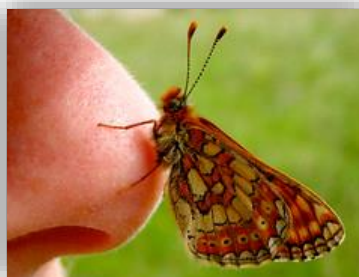
The smells we are exposed to in the workplace, as well as in our personal environments, can have a very positive, relaxing impact on us and can even speed up information processing, or it can actually slow down information processing and negatively impact our memory, concentration and therefore even our performance in the workplace.



*The **pituitary gland** plays a significant role in regulating vital body functions and general wellbeing. It is referred to as the body's 'master gland' because it controls the activity of most other hormone-secreting glands.*

Your pituitary gland is about the size of a pea and is situated in a bony hollow, just behind the bridge of your nose. It is attached to the base of your brain by a thin stalk just below the hypothalamus.

Smell is an important sense that we have been under-utilizing in the workplace and learning environments. Smell is the only one of the five senses that is directly linked to the sub-conscious mind. Accordingly, smell can have a direct impact on our level of relaxation or agitation.



Females are more sensitive to smells than males. The effect of fragrance on productivity and relaxation is profound and should not be underestimated when applied in an environment.



Lemon Grass



Mint

Brain research shows that:

- On a forty-minute alertness test (like that needed for traffic control or long-distance driving), thirty-second bursts of Peppermint or Lilly of the Valley (Muguet) scents every five minutes resulted in a 15 to 25% improvement in performance.
- Productivity among keypunch operators improved 21% with Lavender bursts, 33% with Jasmine and a startling 54% with Lemon bursts!



Lavender – 21%



Lemon – 54%

Pleasant natural fragrances help people to be more efficient, reduce their risk levels, form more challenging goals, negotiate more agreeably and behave less aggressively.

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NAP Practitioner Training Program

Learning Content Guide

Version: 1.2

- Within one minute, spiced apple scents yield more relaxed brain waves and an average drop in blood pressure of five millimeters of mercury.
- When people who frequently suffer from anxiety and panic attacks inhaled heliotrophin (an organic compound commonly found in fragrances and flavors), they exhibited 63% less anxiety.
- People exposed to floral odors consistently solved puzzles 30% faster.
- Aromas may be potent enough to boost learning, decrease food intake, increase productivity and aid in relaxation.

Workplace Applications:

- Be sympathetic to complaints about bothersome smells such as perfume, gas, food or smoke. Sensitivity to bad odors can be highly disruptive and inhibit performance and even health.
- Use women more for tasks that require an acute sense of smell, like chemical analysis, safety inspections (e.g. gas leaks), and even lie detection (e.g. perspiration odor).
- Use fragrance diffusers or room scent enhancers in offices and training rooms.
- Scents to enhance mental alertness are Peppermint, Lemon, Basil, Cinnamon, Rosemary and Lavender.
- For calming influences and relaxation in a learning environment, consider naturally fragrant wood furniture (e.g. Cedar or Cypress), home-type fragrances, natural objects (e.g. a bowl of apples) and oils (e.g. Lavender, Rose, Spiced Apple).
- Consider supplying Chamomile, Spiced Apple, Lemon, Jasmine, Eucalyptus and Peppermint teas as alternatives to caffeinated beverages.
- Where possible, provide tools that possess a natural texture and odour.
- Alternate the use of fragrances regularly.

The **quality of the air** that we breathe in is also very important.

Human breath and electrical appliances seem to charge air particles positively, but here “positively” does not mean it is a good thing, since this slows down our ability to process information and concentrate. Negatively-charged ions, improves our concentration.

If you go outside after a thunderstorm, what does the air feel like?

You may sometimes even experience a bit of an energy rush after you go outside, because during a thunder storm, the electricity negatively charges the ions in the air, and that speeds up electrical transmission.



Lightning (thunderstorms), water, Ion generators, plants and open windows, negatively ionises the air, which is good for concentration. Unfortunately, In areas of higher population, the atmosphere's healthy balance of positive to negative ions is disrupted. Human activity, computers and electromagnetic appliances destroy negative ions, which affect the oxygen we breathe and thus, the brain's performance. Smoke, dust, smog, pollutants, heating systems, coolers and traffic are other factors destroying negative ions.



Many lethargic and underperforming learners may simply be highly susceptible to the ionization changes in the air. Negatively charged air has a powerful positive impact on the body and people's behaviour. Studies show that negatively ionized air affects Serotonin levels in the bloodstream, stabilizes Alpha rhythms, positively impacts our reactions to improved learning and well-being, and enhances performance in mental tasks. Studies have shown that **negatively ionised air** affects **Serotonin levels** in the bloodstream, stabilises Alpha rhythms and positively impacts our reactions for improved learning and well-being, ensuring enhanced performance in mental tasks.

Therefore, plants and sufficient availability of water are good in the workplace!

Practical Applications:

- Plants affect mental performance and productivity positively. Have as many plants in the environment as possible.
- Install ion generators and environmental ionizers in your environment. Be sure to get one powerful enough for the size of the room.
- Where possible, open windows and allow fresh, clean air to circulate through the environment.
- Water also contributes to negatively ionized air. Where appropriate, bring water features into the environment.

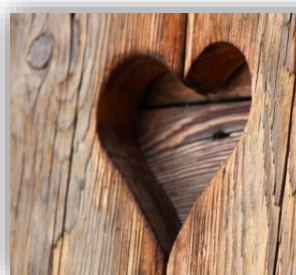
Brain Ergonomics - Increasing performance and health through kinaesthetic processing

Kinaesthetic processing means learning through touch, feeling and movement.

Natural textures

We have underestimated the impact of walls, wood, plastic, concrete and glass. For some people, the sense of touch is an important element of good feeling and motivation. Be aware that artificial touch sensations can demotivate people.

Some people prefer glass, wood, leather or metal to plastic; wood to metal; natural fibers to synthetic fibers; natural plants to artificial plants; china to plastic or paper plates, and so on. The texture of natural wood and leather furniture and fittings reduces stress when touched by learners. Too many artificial textures can induce lacklustre performance.



Practical Applications:

- Where possible, provide work and learning tools that possess a natural texture. Using a wooden instead of a plastic ruler, can add a bit of pleasurable sensation.
- Consult with others about which textures, materials or tactile sensations are important to them in the work or learning environment.
- Always ensure that all carpets, chairs, tables and office furniture are as close to natural textures as possible.

Brain Ergonomics - Temperature

Temperature has a huge impact on your brain.

Different studies have been done on how people perform, when exposed to different temperatures. It is estimated that somewhere between 16 and 22° Celsius, is where we perform best.

Between, 16 – 18° is optimal, provided it is not uncomfortable; especially in environments where we are required to think, learn and or operate dangerous machinery. In such cases, cooler is always better than warmer circumstances.



The brain performs better under cooler circumstances, than warmer circumstances.

We should rather keep the air cool in our working and living environments and wear a jacket if needed.

Research shows that heat stress dramatically lowers scores in both intellectual and physical tasks. While many obstacles are known to reduce performance, learning and productivity, heat stress is one of the most preventable.

Brain temperature can affect the level of neurotransmitters in the neuro-circulatory system, especially the level of norepinephrine.

A rise of only 33 to 37 degrees Fahrenheit in brain temperature above normal is enough to disturb brain function. People respond differently to temperature and what constitutes warm or cool.

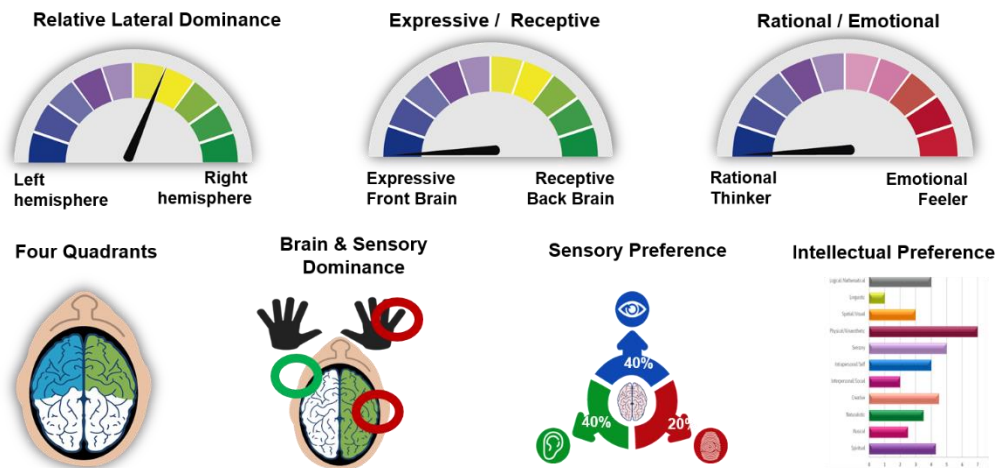
Practical Applications:

- Provide people with a choice about the temperature of their environment. Give options for people to sit where it is cooler or warmer.
- Teach people to breathe through the nose. It cools the brain and lets people relax.
- In areas where alertness is necessary, keep temperatures in the upper range of the comfort zone. When a room is too cool, it may negatively influence alertness.
- Keep temperatures in the lower range of the comfort zone in areas like waiting rooms, sales presentations rooms, cafeterias and break areas where you want people to be relaxed.



Module 9: Interpretation of the NAP™

Neuro-design



1. How does your design impact your potential?
2. Is there alignment between who you are and what you do?
3. How does your design impact your risk for human error?
4. How are you talented?
5. What is your figurative learning/ thinking language?

Neuro Flexibility

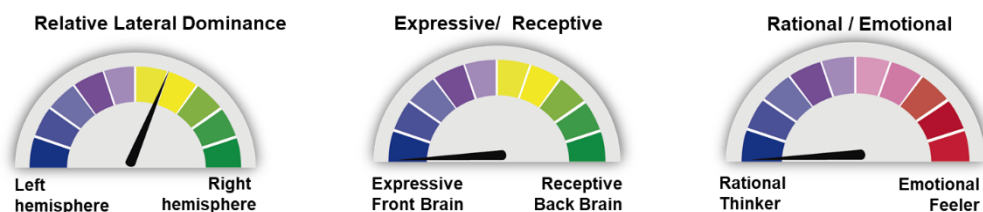
Neuro flexibility is your ability to utilize the full range of a specific neurophysiological attribute of thinking or learning, depending on what function is required of you in that situation.

If you're not neuro flexible, you may alternate between the opposite modes of that specific neurophysiological component, which implies that you will either utilize one **or** the other mode of that component, rather than the full range of all modes of that component simultaneously.

Balance and flexibility between the various modes of the neurophysiological components that impact your neurological design will influence how flexible you are to move across ideas and understandings easy and quickly, and are able to maximize the potential learning value of your previous learning experiences in new, first time, stressful situations.



When your NAP™ indicates that you are balanced (in the middle four blocks on the dash board of your neurological design p.19) with regards to one of the 7 neurophysiological components of learning, like for instance your Relative Lateral Dominance, your neuro flexibility dashboard will indicate a flexibility score of somewhere between 80-100%.

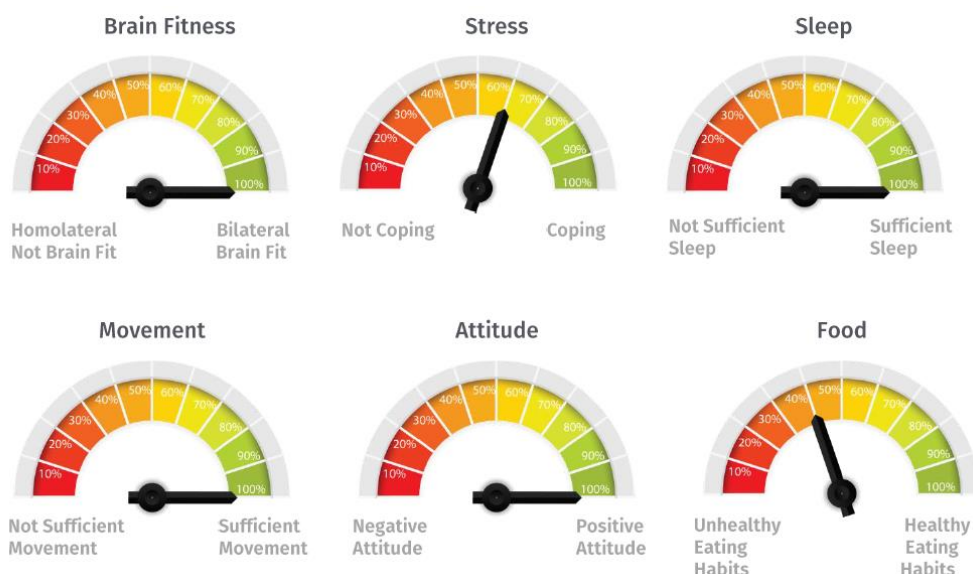


Your neuro flexibility will impact the speed, ease, but specifically the adaptability with which you learn and perform.

The score can be interpreted as follows:

- 0-59% = Priority for further development
- 60-79% = Needs refinement, but on your way to flexibility
- 80-89% = Flexible. Competitive
- 90-100% = Very flexible. Highly competitive. Excellent level of neuro flexibility

Drivers that optimize brain performance



1. Consider impact of each driver on overall brain optimization
2. Consider overall brain fitness (brain balance)
3. Prioritize actions to improve brain optimization
4. How are you talented?
5. How do these drivers influence your neuro-design?

Brain optimization score

Your overall score for brain optimization will impact the speed, ease and adaptability with which you process information learn and perform.

The score can be interpreted as follows:

- 0-59% = Priority for further development
- 60-79% = Needs refinement, but on your way to optimized performance
- 80-89% = Good brain balance. Competitive
- 90-100% = Very good. Highly competitive. Excellent level of brain balance and fitness

If optimized, these drivers will increase the ease, speed and flexibility with which you process information, think and learn.

It can also significantly improve our brain health, memory, focus, cognition and energy, thereby impacting performance, engagement, learning agility, well-being and overall brain fitness.

When these drivers are not optimized, even when you have outstanding potential, it will have a negative impact on your overall performance and neuro-agility.

Neuro-Agility

Your level of neuro-agility is determined by the interplay between the dimensions of drivers that optimize your brain performance and the neuro-design components that cause neuro flexibility.

The sum total will impact the speed, ease and flexibility with which you learn and perform. The NAP™ will also indicates the areas you need to development further in order to improve your neuro-agility.

Neuro-agility has an impact on your future progress, performance and competitiveness.

The score can be interpreted as follows:

- 0-59% = Priority for further development
- 60-79% = Needs refinement, but you are on your way to being neuro agile
- 80-89% = Agile. Competitive. Neuro-agile
- 90-100% = Very agile. Highly competitive. Excellent level of neuro-agility



Module 10: How to debrief the NAP™

Logistics for F2F assessment

- printer and computer is working
- paper and ink
- profiles on your computer
- 2 pencils and paper
- Have water available
- Put on baroque music
- Humanize the environment – ensure sufficient lightening, fresh air and cool temperature

Before the F2F assessment

- Be on time
- Choose to be in a positive mind-set and friendly
- Put the client's needs first
- When meeting the clients, look them in the eye, shake their hands, repeat their names and remember their names
- Set the person at ease. Create a positive, relaxed psychological environment that is non-threatening
- Minimize any possible hindrances like telephones, interruptions etc.

Explain the following to the person:

It is not a test!

- There is no wrong answer.
- No negative information will come from the profile that may embarrass you in any way.
- In no way is the profile meant to disqualify people for anything

“This profile determines your PREFERENCES

– not how competent you are!

“Please indicate your natural preference, or the answer that comes to mind first.”

Clarify the following to the person:

- “**Relax.** Please drink a glass of water “
- “Are you on any medication?”
- If possible speak a client's first language/ mother tongue
- Preferably parents should not be present while compiling the profile. Have sufficient reading material available while they are waiting

While compiling the profile, keep the following in mind:

1. Observe accurately without the person feeling uncomfortable
2. When speaking to the person, say their name often



3. Use language applicable to the person's age
4. Ensure the person has accurate understanding of what each question means
5. Ensure sufficient space for movement and determining eye dominance (more than 10 feet)

Compiling the NAP™ for groups

1. Connect your data projector to your laptop
2. Enter the appropriate NAP™ program
3. Ensure questions can be seen clearly on the screen by all attendees
4. Provide each attendee with a response sheet
5. Please ensure that all their personal details have been completed
6. Remind attendees that each question needs to be answered
7. Explain: Neuro-Design questions are about **Preference**
8. After ensuring that each question has been answered take in all the response sheets

How to purchase profiles

1. Do the payment for your purchase
2. Email through the Proof of Payment
3. The amount of profiles you purchased will be loaded onto your account on www.neuro-link.net/cms/
4. Click on do a profile
5. Set up an account
6. Log into your account
7. Click on do a profile
8. Click on activate for own use if the profile is for you
9. Click on transfer and activate if you want to send the profile to someone to complete and then send it back to you
10. Click on transfer if you want to send profiles to someone else who purchased profiles from you.



Debriefing the NAP™

After compiling the profile, keep the following in mind before explaining the technical data of the profile :

1. The profile is a development tool, aimed at indicating people's potential rather than a limiting tool focusing on weaknesses or labelling people. Avoid negative and / or labelling language
2. This is not what Neuro-Link is saying about the person but the person indicated about themselves. Should people not agree on the result of the profile they should question whether it was answered correctly. The profile is only reflecting the child's responses.
3. Feel free to engage and ask questions as we progress

Explain the following to the person:

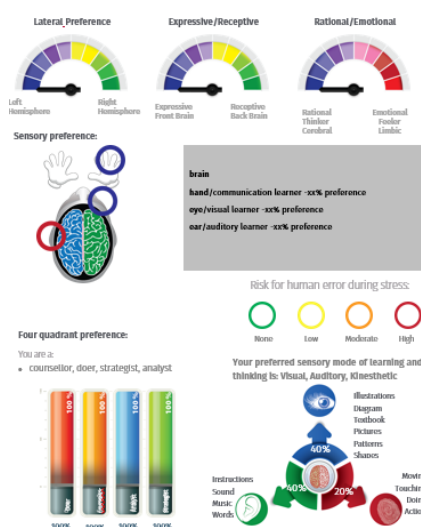
Purpose of the profile:

- To improve your neuro-agility
- Determine your unique neuro-design
- Align your design with job & career choices
- Optimize your brain performance
- Identify how you are talented
- Reduce your risk for error
- Create a personalized individual development plan

Start with debriefing:

1. 7 components of your neurological design (page 19 NAP™):
 - Relative Lateral Dominance
 - Expressive / Receptive Preference
 - 4 Neo-cortex Quadrants
 - Rational / Emotional Preference
 - Brain & Sensory Dominance Profile
 - Sensory Preferences
 - 11 Intelligence Preferences

Summary: Your Unique Neurological Design



Reflection:

1. How does your design impact your potential?
2. How are you talented?
3. Is there alignment between who you are and what you do?
4. How does your design impact your risk for human error?
5. What are your figurative learning/ thinking languages?

Next steps after debriefing:

- What value do you have? List what it is you believe you have potential for with regards to:
 - Relative Lateral Dominance
 - Expressive/Receptive Preference
 - 4 Figurative Learning Languages
 - Emotional/Rational Preference
 - Brain, Eye, Ear & Hand Dominance
 - Sensory Learning Preference
 - Intelligence Preferences
- List areas for further development and learn the skills to improve your balance and neuro flexibility WRT:
 - Relative Lateral Dominance
 - Expressive/Receptive Preference
 - 4 Figurative Learning Languages
 - Emotional/Rational Preference
 - Brain, Eye, Ear & Hand Dominance
 - Sensory Learning Preference
 - Intelligence Preferences
- Reflect on how your neuro-design influence your relationships and communication with others.
- What can you do to improve it?
 - Do assessments of others.
 - Learn appropriate listening & communication skills
- How does your neuro-design influence your neuro-agility? How neuro balanced are you?
- What is the unique contribution you make in the group?
- How does that compare with the general group character?
- How can your neuro-design clarify the role you play in the group?
 - Do group assessments, analysis and team building
- List actions you can take to align your job with your design and how you are naturally talented?
- Analyse your neuro-design and answer the question “Who am I?”
- Analyse your potential risk for human error and learn actions you can take to reduce your risk for error. (Do stress management & fatigue management modules)



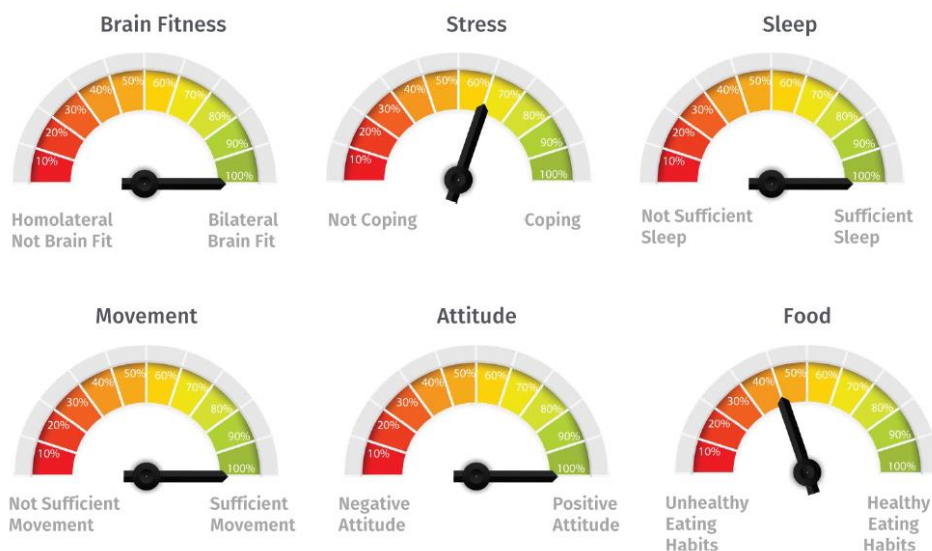
2. Neuro flexibility (page 20 NAP™)



Reflection:

1. How does your design impact your neuro flexibility?
2. How neuro flexible are you?
3. Which components needs to become more flexible?
4. What skills do you need to improve your overall neuro flexibility?
5. What is the goal? What is the plan to improve your neuro flexibility?

3. Drivers that optimize your brain performance (page 27 NAP™)



Reflection:

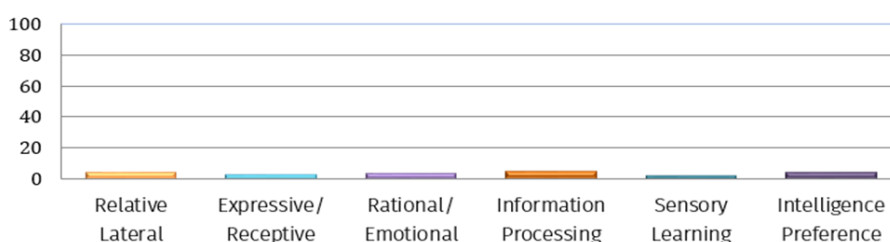
1. How do you think these drivers influence your brain health?
2. How do you think these drivers impact your performance?
3. In which areas do you still need to develop further?
4. What is your plan of action to optimize your brain performance?

Next steps after debriefing:

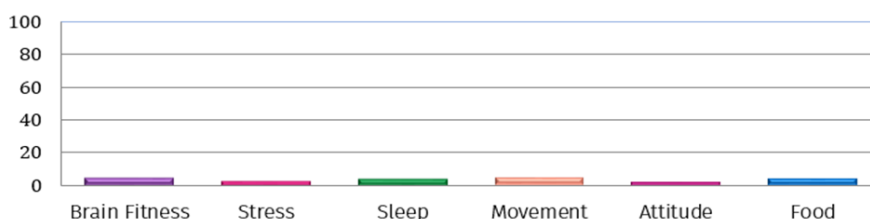
- Create a brain optimization plan of action to improve your neuro-agility and brain health,
- Learn the skills to improve the drivers to optimize your brain performance by either doing live training or the online Neuro-Link neuro-agility modules,
- Align your life style with your development choices,
- Stay updated with relevant information by using resources like blogs, newsletters and websites

4. Neuro-Agility (page 29 NAP™)

Neurodesign Attributes that Impact Neuro Flexibility



Drivers That Optimize Brain Performance



Average for Your Overall Neuro-Agility:

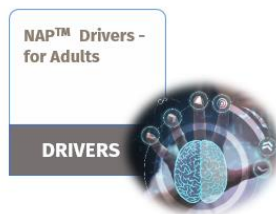
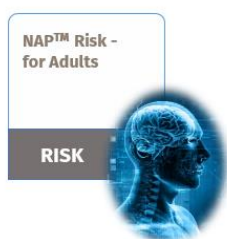
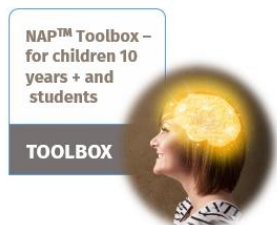


Reflection:

1. How does your overall neuro-agility influence the ease, speed and flexibility with which you think and learn?
2. In which dimension are you strongest?
3. Which components need to be optimized more?
4. In which dimension do you need to develop more?
5. What skills do you need to develop to improve your overall neuro-agility?
6. What is the goal? What is the plan to improve your overall neuro-agility?

Module 11: The Neuro Agility Profile™ & Variations & Differences

Various assessments are shown below:



Module 12: Case studies

The NAP™ is the first scientifically validated neuro-agility tool in the world. Your next question is likely, “but does it work?” Like most business people, you need to be bottom line focused and show real results in order to get buy-in from your key decision makers and clients.

There are reputable organizations that have used the NAP™ and gone on to see exceptional performance improvements, and real bottom line results. The evidence in the following case studies are specific, measurable, and scientifically validated results that prove the NAP™ is your most valuable and successful assessment tool for identifying potential, developing talent, reducing risk for error and improving performance, engagement, wellness and happiness. These success stories go beyond mere testimonials.

It’s not enough to say that the NAP™ works. These case studies bring to the table evidence of a clear **return on investment (ROI)**; that is: clear statistics and research that link the NAP™ to:

- Higher profits and/or productivity and/or sales;
- Increased performance; better learning results
- Improved customer satisfaction;
- Decreased absenteeism from work;
- Decreased incidents and accidents;
- Reduction in costs and human errors



High performance team development



Background

- Executive team of a Global Middle Eastern Bank.

Purpose

- To explore the impact of neuro-agility skills on the success of banking executives;
- To optimize performance and increase mental flexibility, taking this high performance team to the next level;
- To predict key agility competencies associated with top performance from which talent selection criteria can be generated.

Results

- See team data Power Point

ROI impact

- 100% of respondents stated that knowing which drivers to optimize and how to improve their neuro-flexibility, helped them in transitioning to a higher level of performance;
- Using their findings from the NAP™, the team re-aligned their job functions with their neuro-design in order to optimize engagement;
- The NAP™ and neuro-agility training will be used by the bank to create personalized development programs, offer guidance to trainees regarding their unique potential (neuro-design) and provide learning solutions that will increase the learning agility;
- The findings from this study were highly predictive, i.e:
 - High neuro-agility scores predicted high performance.

Take away

- Increased leadership performance;
- Better leadership engagement;
- Using the NAP™ with other selection instruments for selection generates:

- Higher performing employees
- Decreased attrition rates
- Using the NAP™ for training and coaching generates:
 - A road map for leadership success
 - Better performing leaders

Risk for human error



Background

- The mine manager of one of the biggest iron ore mines in the world wanted to reduce the occurrence of accidents and incidents caused by human error.
- A survey done by industrial psychologists confirmed that first-line truck drivers and crane operators experienced an increase in dangerous incidents and accidents due to:
 - fatigue
 - absenteeism from work
 - a negative mind-set.

Purpose

- Find solutions to help individuals reduce their risk for human error related incidents and accidents;
- Reduce absenteeism;
- Find solutions to reduce fatigue;
- To explore the impact of the NAP™ assessment and neuro-agility training on first-line truck drivers and crane operators.

Actions taken

- **Brain ergonomics assessment** of the cabins in which the operators / drivers work, as well as the hostels where they sleep, was made to determine how humanized the cabins and hostels were. Appropriate measures were taken to humanize the inside cabins of vehicles and machinery and create hostels that are conducive for sleep and rest.
- **NAP™ brain profile assessments** were done on all operators, drivers, supervisors and managers to determine how they process information and identify possible neurological hindrances that may increase their risk for human error during stress or fatigue. A group report was created from the individual profiles to determine general levels of fatigue and identify tendencies and patterns that need to be addressed in the business units.

- **Leadership was trained** to understand how fatigue and stress may cause neurological hindrances that will increase a person's risk for error and cause accidents. They were also trained in solutions to reduce fatigue so they could make appropriate decisions and introduce changes and actions to create an environment more conducive for health, safety, positivity and productivity.
- **NAP™ brain profile debriefings** were done with crane operators and truck drivers in order for them to understand themselves accurately and be aware of how their stress, fatigue levels and lack of sleep may cause possible neurological information processing hindrances and increase their risk for human error.
- The Neuro-Well Program, a **holistic, neuroscience approach to fatigue management** (body/mind/spirit) was designed for first-line management, leadership and workers. The NAP™ assessment served as the point of departure for the learning interventions as participants could refer back to their brain profiles to determine which fatigue solutions would be applicable to them personally in order to minimize neurological hindrances and reduce their risk for human error.
- Specific sequences of **brain fitness techniques and activities** that would prepare the neurological system for information processing and “switch it on”, was designed for first-line operators to do every 90 minutes during a shift. These activities were also made part of their performance management criteria as to ensure that they would be done.

Results

- A **significant decrease in fatigue** related incidents and accidents, which directly impacts on saving lives and preventing injuries.
- A **decrease in absenteeism** of 24% which had a direct impact on productivity and performance.
- Behaviour changes in mind-sets of operators and truck drivers changed from a pessimistic to a more **optimistic mind-set**, which directly impacted interpersonal relationships, company culture, performance and health in the medium to long term.
- Increased performance and productivity at the end of this intervention was observed at an all-time high as more tons of iron ore was excavated. This resulted in a **14th check performance bonus of 4, 5 times their monthly salary** that was paid.
- A post assessment was used to evaluate **brain fitness** levels, which improved by 22% on average. A 100% of first-line operators and drivers commented that the brain fitness techniques and activities contributed towards **decreased fatigue** and **improved focus**.
- The intervention was rated as **86% by the Kirkmax** assessment, which means that a **highly commendable performance** was achieved.

ROI impact

- 100% of respondents stated that knowing their neuro-design and potential risk for error helped them in managing fatigue better and reducing their risk for error.
- Accident free hours were exceeded with hundreds of thousands of hours.

- Findings from the NAP™, helped develop a pre-employment screening system to determine potential risk for error. These findings led to the following:
 - increase in employee retention,
 - a report to the holding company stating that the mine are more productive and the NAP™ should be implemented division-wide.
- This neuro-agility pilot study resulted in significant bottom line findings that this mine now integrates into their health and safety initiatives.
- The reduction of incidents, accidents and absenteeism in the workplace could be attributed to Neuro-Link's NAP™ and neuro-agility interventions.
- The findings from this case study were highly predictive, i.e. :
 - Neuro-agility subscales predicted risk for error 100% of the time. These include: information processing style and brain fitness, stress and fatigue levels. This mine now uses the NAP™ case study results as a predictive model for both the selection of new personnel, creating personalized development programs and providing neuro-agility learning solutions.

Take away

- Using the NAP™ for business optimization purposes generates:
 - Large reductions in costs related to incidents and accidents
 - Decreased attrition rates
 - Increased productivity
- Using the NAP™ for health and safety purposes generates:
 - A personalized approach to reducing risk for human error
 - Reduction in absenteeism
- Using the NAP™ for selection and development purposes generates:
 - A road map for personalized development programs
 - Higher performance

Individual wellness & performance improvement



Background

- The case study involved a male participant, 27 years of age. At the time of the study the participant was unemployed and his highest level of education was a National Senior Certificate (matric). The participant was brought to the Limitless You Academy by his father who expressed concerns about his son's general state of wellbeing. The father saw the need for an intervention in his son's life due to various issues, namely: lack of self-esteem and self-worth; bad habits; inability to cope with current life situation; lack of motivation and drive; difficulty sleeping; anger and aggression problems; anxiety attacks; depression; withdrawal from previously loved hobbies/interests; reduced physical activity/ sedentary lifestyle; and poor general lifestyle choices.

Purpose

- The purpose of the case study was to investigate the impact of the LYPPP neuro-agility interventions on overall wellbeing of the participant.
- To explore the correlations between the NAP™ and improving wellness and brain health.
- To develop a training and development program with a strong scientific basis as well as a measurable implementation and evaluation process

Results

- One page overview: [Poster Case study1](#)
- Detailed article: [Case Study-Investigation into LYPPP Monarch](#)

Impact

- The average for the drivers influencing **brain performance increased by 35%** from pre-test (46%) to post-test (81%) assessments, indicating overall improved brain performance following the 4-week intervention period.

Conclusion

Of the skill-related fitness components, major post-intervention improvements were seen for all of the visual skills assessments as well as the coordination tests. Both major components of the brain-fitness index revealed excellent improvements in overall psychological performance and functionality. Below is a description of important psychological and related problems reported before and after the intervention training?

Before training the client reported sleep problems. He especially had difficulty falling asleep, waking up, nightmares and Bruxism. He complained of constant fatigue, ringing in the ears and stomach pain. He also reported having a big problem with concentration and distractibility and was taking Concerta for this. There were also complaints of anger and aggression problems, risk taking behaviours and binge drinking. Mood swings, anxiety and depression was also reported.

- **Improved sleeping pattern lead to increased alertness.** After the fourth neurofeedback session he reported that he was sleeping much better and did not feel as tired. The parents also reported that his mood had improved a lot and that they were able to have better conversations with him again. After session 6 he reported that he is now able to go to bed at 10 or 11 at night instead of 1:00 or 2:00 in the morning. He was also now able to sleep for 7 or 8 hours and get up refreshed and ready for the day. He was feeling more efficient and doing things around the house instead of sleeping until 10:00 or 11:00 am. By session 8 he reported that he was not using his Concerta anymore but was sleeping very well and feeling motivated and more focused. He started exploring the idea of continuing his studies again. By the end of the 15th sessions all sleep issues initially reported had resolved. He was feeling much more relaxed and focused. He wasn't experiencing the depressive and anxious symptoms anymore. His concentration and focus was much better without the medication.
- **Relationships improved.** His parents also reported that they were getting along much better.
- **Behaviour improved.** They also experienced a large improvement in his mood and with aggressive behaviour.

Take away

- The NAP™ serves as an effective and comprehensive tool for pre and post-evaluation of wellness and brain health improvement interventions.
- The holistic approach of the LYPPP intervention program leads to augmented brain-body balance and an enhanced state of overall wellbeing.



Talent development



Background

- To speed-up the mine's growth and performance goals by **identifying high potentials, optimizing their performance** and "fast-tracking" them to managerial level

Purpose

- Explore the relationship between high performing candidate's neurological design and their potential.
- Determine key competencies associated with top performance from which selection criteria can be generated.
- Understand the relationship between NAP™ and leadership competencies and enhance the training and coaching of high potentials in the organization.
- To develop a training and development program with a strong scientific basis as well as a measurable implementation and evaluation process.

Actions Taken

- A **Neuro Agility Profile™ Advanced+** brain profile assessment was compiled of all Fast Track candidates to identify their potential and optimize their brain performance and flexibility. This assessment also has a section that measures the person's neuro-design that is an indication of the person's unique learning potential which serves as a good point of departure to start identifying and developing talent.
- Subsequently, a **12 Emotional Intelligence Competencies Profile™** was compiled of all Fast Track candidates to determine their emotional intelligence competencies. The World Economic Forum rates 5 of the 10 most desired skills for the workplace are emotional intelligence skills. Studies prove that Emotional intelligence (EI) is the skill set that will have the single biggest impact on improving your performance. The purpose of

this assessment is that it indicates the level of competence with regards to 12 emotional intelligence skills of primary importance. It also serves as a plan of action to improve performance.

- All Fast Track candidates underwent Neuro-Link's emotional intelligence development program called the **High Achiever**, consisting of **9 modules of brain-based intrapersonal and interpersonal competencies**. A neuroscience approach was followed by using the NAP™ Advanced+ brain profile assessment as the point of departure for developing each of the 12 emotional intelligence skills of primary importance. One module per month was presented to Fast Track participants over a period of 9 months.

Results

- Impact of the program was rated as **86%** by the Kirkmax assessment, which means that a **highly commendable performance** was achieved.
- An **Organizational Climate Assessment** was done after Neuro-Link's High Achiever Program. The OCA indicates whether a learning intervention impacts company bottom line and is worth implementing. A minimum result of 3.1% improvement result was required to prove sufficient return on investment for the company. An **8% result** (almost 3x the expected result) was achieved.
- **87% of participants were promoted** to a supervisory or managerial position within 9 months of completing the Program.
- **Noticeable behaviour changes in positive attitudes and company culture** was observed.
- Post-assessment evaluated overall brain fitness and emotional intelligence competencies. Course participants' **brain fitness levels improved 20%**, intrapersonal competencies improved **15%** and interpersonal competencies improved **18%**.

ROI impact

- The OCA assessment used by the mine to determine ROI proved the mine received an almost **3 times better return on their investment**.
- 87% of **high potentials were promoted** within 9 months of completing the programme
- 99% of respondents rated neuro-agility and EI skill-sets as essential skills that will help them in **transitioning to a higher level** of performance.
- The findings from this pilot study were highly predictive, i.e.:
 - Neuro-agility and emotional intelligence sub scales **predicted high performance 97% of the time**.
These include: self-awareness, learning agility, stress tolerance, interpersonal communication and empathy. This organization now uses Neuro-Links High Achiever approach as a predictive model for the selection of new personnel, performance improvement, talent development and leadership development.

Take away

- People's neurological design is a fundamental point of departure for establishing their potential.

- Any initiative to improve agility, whether we are talking about learning ability, leadership agility, emotional agility or organizational agility has to start with improving neuro-agility.
- Neuro-agility is one of the key competencies associated with high performing individuals.
- Using the NAP™ as the point of departure for selecting and developing high potentials generates:
 - Large reductions in costs
 - Decreased attrition rates
 - Increased workplace engagement and productivity
 - Reduction in human error
 - Better performing leaders

Leadership development



Background

- The organization is an international logistics company who is developing the leadership of the company according to the transformation goals and guidelines of South Africa. Regardless of working towards achieving the transformation goals and the subsequent succession planning that had to take place, concerns were raised by the HR executive of a **declining learning culture**, an increase in **workplace conflict** and **unsatisfactory service levels** that required immediate attention.

This program also took additional personal development needs into consideration and address it.

Purpose

- Develop executive leaders.
- Improve the culture of learning.
- Create personal development programs.
- To explore the impact of neuro-agility and emotional intelligence skills on the success of executive and future leaders.

- To understand the relationship between NAP™ and leadership competencies to enhance the training and coaching of leaders in their organization.
- Improve key emotional intelligence competencies that addresses workplace conflict, service orientation and team functioning.

Results

- Behaviour changes in mind-sets of executive team members changed to a general, **optimistic mind-set** that also cascaded into a more positive impact on company culture
- Executives also reported increased **social cohesion** and better conflict resolution between colleagues.
- **Bonuses** based on performance and productivity at the end of the year was paid as Savino experienced very good profits, which in part, reflected better leadership skills and change in company culture.
- Participants rated the High Impact Leadership Development Program that was done by the Kirkmax evaluation program. Kirkmax evaluates course administration, impact and relevance of the learning intervention, job application and instructor competence. An 80% result would indicate to the company that the intervention positively impacted behaviour and performance. A result of **84% was achieved**, which means that this leadership experience produced a **commendable performance** in the workplace and that this learning experience has produced a **satisfactory return on investment for the company**.
- Specific business units implicated for low service delivery and not making a profit showed a business turnaround by **significantly improving their service delivery** and started making a **profit** again.

Intervention

- Neuro-Link believes: “you can’t improve what you can’t measure”. The pre-development phase of this Leadership Development Program was for participants to complete their **NAP™ Advanced+ brain profile assessment** that measures their neuro-design and the drivers that optimize brain performance.
- Subsequently, executives completed the **12 Emotional Intelligence Competencies Profile™** to measure 6 intrapersonal and 6 interpersonal competencies to determine their emotional intelligence competence.
- The development phase started when executives were empowered with emotional intelligence skills by doing **9 brain-based, emotional intelligence modules** that consist of 6 intrapersonal competencies and 6 interpersonal competencies over a period of 9 months – 1 module per month.
- In the third phase, participants received **12 executive coaching sessions**, one per month, for a period of one year, to ensure on-the-job application of emotional intelligence and leadership skills.
- All executives were then **trained as coaches** to impart their knowledge and skills to the emerging leaders. By the time they were finished with their coaching and coaching training, executives were ready to start coaching their Coachees.



- While the executive team was receiving their executive coaching, the **next level of upcoming executives** (senior managers) started with the same development process as their executives.
- This process is **annually repeated**.

ROI impact

- The findings from the Kirkmax evaluation indicated that this intervention is **positively impacting company bottom line**;
- 100% of respondents stated that knowing their neuro-agility and EI strengths helped them in **transitioning to a higher level role**;
- 100% of coaches stated that knowing the neuro-design and mental strengths of their Coachees **significantly strengthened their coaching relationship and the impact of coaching**;
- **Improved engagement**. Using their findings from the NAP™, informed decisions could be made to align job functions with neuro-design;
- This powerful information will be used by the organization to offer guidance to employees and emerging leaders regarding their potential. It will also serve as a strong baseline to create **individualized development programs**;
- This pilot study resulted in significant bottom line findings that at least two thirds of the skill set required for successful execution of this organization's leadership competencies is comprised of agility and emotional skills;
- The findings from this pilot study were **highly predictive**, i.e.:
 - Neuro-agility and emotional sub-scales predicted high performance almost 100% of the time.

Take away

- A neuroscience approach to developing emotionally intelligent leaders have a **significant impact on creating a culture of learning** that impacts bottom line and **promotes organizational and personal growth**;
- Using the NAP™ as the point of departure for doing neuro-coaching with emerging leaders, helped coaches to connect faster and easier with their Coachees, thus **increasing the performance of Coachees** and helping them have a **smoother transition into their leadership roles**;
- Improving neuro-agility grows **high performance individuals** who strengthens **high performance teams**;
- Agile leaders **increase turnover and productivity**;
- Neuro-Link's neuroscience approach to the emotional intelligence development framework provides a **road map for leadership success**, creating better performing leaders;
- Using the NAP™ for coaching and leadership development generates:
 - **Accurate awareness** of personal neuro-design, learning potential and talent
 - **Social awareness** of the unique design of team members, thereby strengthening team synergy and collaboration
 - A coaching approach **grounded in neuroscience (hard science)**
 - A strong point of departure for creating a **culture of learning**



- A world class blueprint for developing **agile leadership success**
- **Better performing leaders**
- A road map for creating **personal development plans**
- Better workplace **engagement**

Performance improvement – university students



Background

- Performance improvement intervention for more than 200 3rd year physiology students of the University of Pretoria

Purpose

- Assess whether neuro-agility training in a higher education environment would impact academic results

Intervention

- A group of 106 final year students went for brain performance pre-assessment (NAP™) at the beginning of the semester;
- Students were required to log 50 hours of neuro-agility training;
- Students were re-assessed on their brain performance at the end of the semester.

Results

- A statistically **significant difference** on each driver that optimizes brain performance was recorded;
- Students improved the drivers that impact their brain health and performance with **10,43%**;
- Students improved their learning skills with **9,43%**;
- A **98, 2%** pass rate was recorded – the highest pass rate yet!
- Overview: [Student Agility onepagerB](#)
- Detail Power Point: [right 3rd year Student Agility case study](#)

ROI impact

- 100% of respondents stated that knowing the information provided in their NAP™ helped them in transitioning to a higher level of wellness.
- Using the findings from their NAP™, students improved the drivers that optimize their brain performance as follows:
 - 11,3% increase in brain fitness;
 - 11,2% increase in stress coping skills;
 - 10,3% increase in brain friendly diet;
 - 6,93% increase in positive sleeping habits;
 - 11, 6% Increase in positive attitude (mind-set).
- Using the findings from their NAP™, students improved their learning skills as follows:
 - 8,95% increase in their general approach to learning;
 - 12,2% increase in memory skills;
 - 8,38% increase in reading skills;
 - 12.9% increase in note-taking skills;
 - 8,95% increase in listening skills;
 - 9, 52% increase in concentration.

Take away

- Using the NAP™ contributed to:
 - Higher pass rates;
 - Better learners performance;
 - Accurate awareness of personal learning preferences;
 - Accelerating learning;
 - Increased ease and flexibility with learning and thinking;
 - Increased brain fitness, memory and concentration;
 - Improved brain health and wellness;



Module 13: Marketing

Marketing Principals

- Create awareness
- Make sure people like you
- Establish trust
- Sell

Remember: Anticipate, recognize and meet your customer's needs!

Marketing the NAP™

1. TTP = Talk To People!!!
2. WOM = Word Of Mouth
3. Produce results
4. Create awareness in local community
5. Information sessions at schools, businesses, or any other interest groups
6. Media like radio, TV, newspapers

Marketing Strategy

“Find a perceived need and address it”

- **Demographics:**
 - Who buys your product?
 - Who is your customer?
 - Understand your customer's perceptions. Find ways to satisfy their needs
 - Learn you customer's language and speak it clear and well
 - **Psychographics:**
 - Why does your customer buy?
 - What are their perceived needs?
 - What are their expectations?
1. What is your promise to attract customers to your business (lead generation)
 2. Make the sale
 3. Deliver the promise (client fulfilment)
 4. What do you do to let them come back for more?

NB: make a promise your customers wants to hear. Deliver better on your promise than any one

1. Create awareness

- Talk to people - F2F discussions
- Information sessions for parent interest groups
- Information sessions at parent evenings at schools
- Presentations to principals and school governing bodies and businesses
- Talk on local radio stations



- Expo's
- Speaking obligations, free taster events, free webinars
- Share case studies, results & stories

Advertise

- Local newspapers & magazines – write up or articles
- Billboards at home and schools
- Social media
- Share free infographics

2. Generate referrals from

- Satisfied customers
- New people you talk to
- People with networks
- Parent evenings at schools
- Parent interest groups
- School contact lists (remedial/guidance teachers)
- Business contact lists
- Expo's
- Collect business cards

3. Make the sale

- Send an introductory letter and/or infographic
- Do a visual marketing presentation
- Make the phone call. Make the appointment

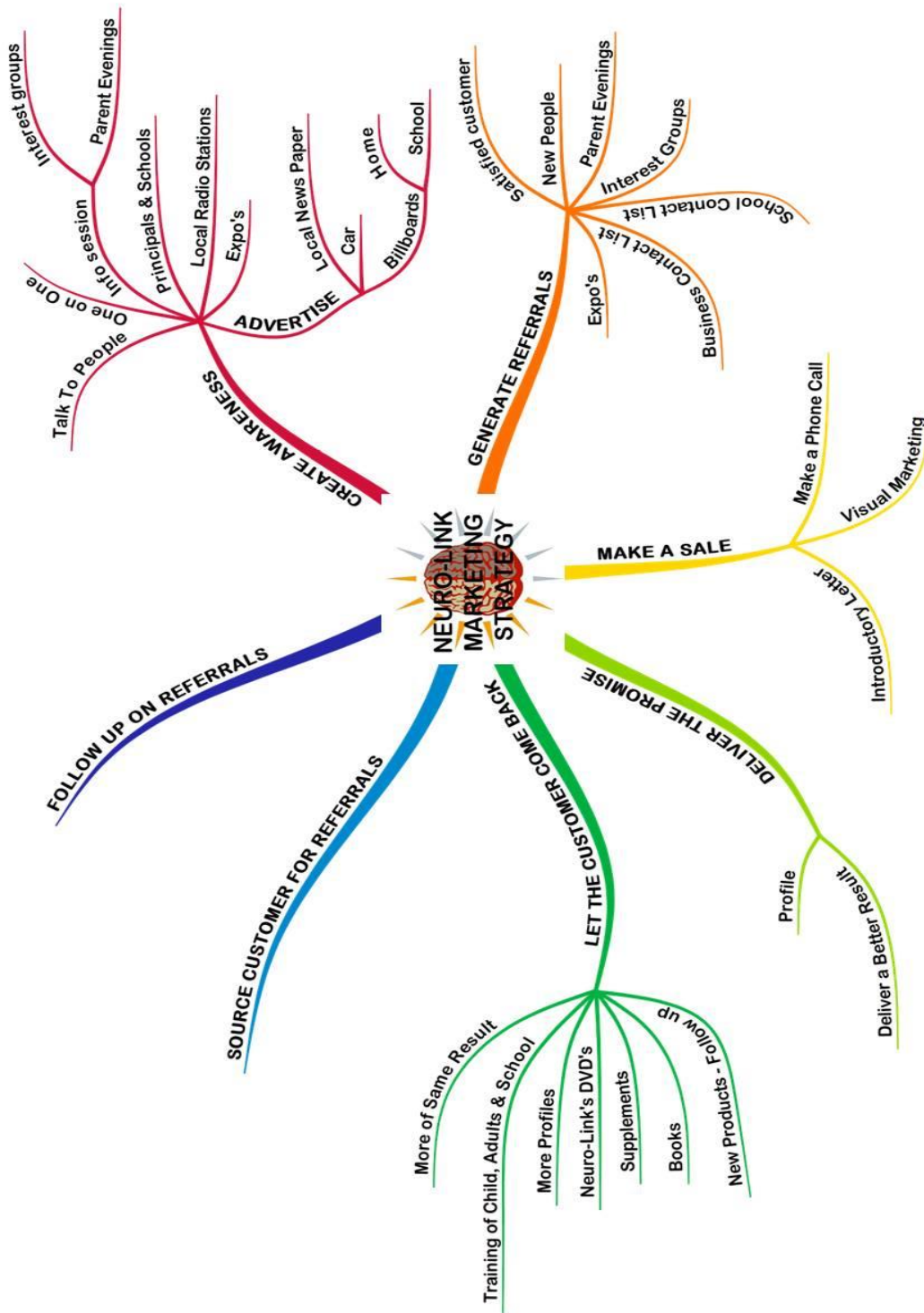
4. Deliver the promise

- Do the profile
- Deliver better results than competition

5. Let your customer come back for more

- Offer more of the same results
- Learning solutions
- Brain profiles for others
- Brain shop products
- Supplements
- Books, information, infographics
- New products in the feature (follow-up on customer)





Frequently asked questions about neuro-agility

1. What is neuro-agility?

Just like ballet dancers need the agility to move quickly and easy, executing their dancing skills with precision, today's workers need the neuro-agility to learn, think and draw conclusions fast and easy and be flexible in moving across ideas, experiences and understandings in such a way that they are able to maximize the learning value of any experience and apply that learning to perform well under first time, stressful conditions. Neuro-agility is about optimizing the neurophysiological components that allows people to be fit and flexible to think, learn, create, solve problems and perform well, quickly and easy.

It enhances the degree to which people engage in agile learning. Neuro agility underpins the brain's ability to be in-flow, learning fast and effectively, committing as little human error as possible. It requires being able to concentrate at optimal level, while engaging the whole brain effortlessly during cognitive processes like learning and thinking. People who are highly neuro agile, have the flexibility to learn new skills, attitudes and behaviours fast and easy and unlearn old behaviour patterns quickly. To do this, they have to optimize the drivers that increase their brain performance and the neurophysiological components that influence their learning and thinking flexibility.

Neuro-agility is about the readiness of all the senses and brain regions to function as one integrated whole brain system, being receptive and responsive to receive and transmit bio-chemical impulses at optimum speed to all brain regions, establish new neural networks, retain, express, and apply information, change behaviour and perform according to potential under new and potentially stressful conditions.

The construct of neuro agility is situated within the broader domain of learning. Neuro agility is an essential component of the "ability to learn" because it focuses on the neurophysiological attributes of learning, thinking and cognitive processes. This multi-dimensional, neuroscience approach, compliments and strengthens the ability to learn and learning agility, but is neither exhaustive nor exclusive to any of these concepts. The framework for neuro agility brings new constructs like neurological design and brain fitness into the arena of the meta-concept of "ability to learn". It also offers innovative perspectives on the neuroscience of performance improvement, talent development and reducing risk for human errors.

2. Why does Neuro-agility matter?

- It advances, anchors and validates the relevance, importance and impact of concepts like learning agility, leadership agility, emotional agility and organizational agility;
- It offers an inclusive neuroscience approach requisite to all global learning practices;
- It offers a framework for understanding how uniquely people learn;



- It offers innovative solutions to optimising and developing people's ability to learn;
- It showcases a conceptual neurophysiological framework for determining human potential;
- It offers a clear neurophysiological framework for why people learn fast or slow and how they can improve their cognitive flexibility and performance;
- It complements and integrates easily with talent selection, talent development and performance improvement practices;
- It offers a higher return on investment on talent development and performance improvement initiatives when grounded in the hard sciences;
- It separates facts from fiction, thereby solidifying learning and development practices;
- It offers a new conceptual framework for reducing risk for human error;
- It significantly contributes to an individual's self-awareness, growth, learning and development.

3. Who should be knowledgeable about neuro-agility and why?

Professionals in the workplace, responsible for:

- creating a culture of learning – neuro-agility should be a core competence and the point of departure for creating a culture of learning;
- talent selection – learning agility has become a sought after skill and a major criteria to select talent;
- talent development – the neurophysiological components offers a framework to identify potential
- developing high performance teams – team leaders should understand their team's neuro-design and align member's natural strengths and preferences with roles and job functions;
- performance improvement – performance improvement cannot start at any other place than optimizing brain performance;
- learning and development – to develop people's learning ability and learning agility starts by understanding the neurophysiological components that determine how people learn and think and optimizing the drivers that improve brain performance and flexibility;
- workplace wellness – the framework for drivers that optimize brain performance are equally as important to maintaining brain health than it is to improve performance;
- workplace happiness – neuro-agility provides a framework that is fundamental to a holistic approach to maintaining workplace happiness;
- employee engagement – alignment between people's neuro-design and their job functions improves engagement significantly;
- health and safety – understanding people's unique neuro-design will indicate their potential risk for human error and offer solutions to reduce it.



Schools and Education:

- All teachers and lecturers responsible for educating others should be knowledgeable about and able to assess the drivers that optimize their student's brain performance and the neurophysiological components that influence how their students learn and think.

Sport:

- Sports coached and athletes should understand how their neuro-design and the drivers that optimize their brain performance influence their performance.

Public:

- Any person who wants to develop themselves, improve their competitiveness and safeguard themselves against future job losses, should understand how neuro-agile they are and how they can improve it further.

4. What is the value of Neuro-agility?

- It addresses the neurophysiological components of learning, thinking and cognitive processes responsible for learning quickly and easy;
- It offers a scientific and comprehensive framework for the neurophysiological components that impact people's personality, how uniquely they learn and think, and their learning agility;
- It makes an important link between the hard sciences (neuroscience) and the behavioural sciences, thereby validating the behavioural sciences more;
- The neuroscience approach offers an inclusive approach to global people development and performance improvement practices as it is exclusive of factors like colour, race, age, culture, language or gender. A brain has no colour, gender, race or culture and neuroscience therefore focuses on what people have in common with each other – a brain!
- Neuro-agility offers a unique neuroscience framework, packaged in a predictive analyses called the Neuro Agility Profile™, for talent development and performance improvement professionals that deepens their understanding of people's learning potential, how to develop talent and optimize performance;
- The NAP™ Group Profile Report provides companies and managers with vital management information about their workforce's brain fitness, brain health, neuro flexibility and neuro-agility to help them understand what talent is needed, identify talent, optimize performance, agility, wellness and reduce risk for error;
- Because of its strong physiological basis, neuro-agility delivers business results as our case studies prove a strong return on investment for our clients;
- It offers a new approach to reducing risk of human error and the incidence of accidents;
- It compliments other people development science like Neuro-linguistics Programming and Emotional Intelligence, and integrates easily with other sound learning technologies.
- The neuroscience approach and frameworks help to separate facts from fiction, solidifying learning and talent development practices.



5. What does the Neuro-agility framework entail?

Neuro-agility consist of 2 dimensions. The first dimension consists of neurophysiological components that influence people’s flexibility in thinking and learning. The second dimension consist of the drivers that optimize their brain performance, which will affect the speed and ease with which they learn as well as their risk for human error.

There is a compelling body of evidence that ties people’s neurological design to components like relative lateral hemispheric dominance, expressive - receptive preferences, rational - emotional preferences, four figurative learning and thinking languages, brain and sensory information processing styles, sensory preferences and Intelligence preferences. These components will impact their personality as well as how uniquely they learn, think and process information, as well as their risk for error. When there is alignment between people’s neurological design and the job functions they perform, they will experience increased work place engagement, well-being, happiness and performance.

To ensure people tap into all their cognitive resources to achieve top performance, they have to leverage all the drivers that optimize their brain’s performance. Research provides strong evidence that ties improved performance to drivers like brain fitness, stress coping skills, sleep, movement / exercise, optimistic / growth mindset and nutrition.

The interplay between people’s neurological design (referred to as neuro-design) and the drivers that optimize their brain performance, significantly influences the ease, speed, and flexibility with which people learn and their propensity for error.

6. What are the implications of neuro-agility?

Research suggests that many practices of old should be replaced with new practices, in order to be more effective and optimize the performance of people and businesses. The table below illustrates how current business approaches and practices will have to change:

MOVE FROM:	TO:
<ul style="list-style-type: none"> Behavioural approach 	<ul style="list-style-type: none"> Neuroscience – behavioural approach
<ul style="list-style-type: none"> Best performer in previous job gets promotion or appointed 	<ul style="list-style-type: none"> Most agile person gets promotion or appointment
<ul style="list-style-type: none"> Skills development focus 	<ul style="list-style-type: none"> Brain fitness, flexibility & then skills development
<ul style="list-style-type: none"> Unstructured agility approach 	<ul style="list-style-type: none"> Structured neuro-agility approach
<ul style="list-style-type: none"> Limited individual assistance to reducing risk for human error 	<ul style="list-style-type: none"> Strong assistance to individuals to identify and minimize risk for error

- | | |
|--------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------|
| <ul style="list-style-type: none"> • Generalised approach to performance improvement & talent development – one size fits all | <ul style="list-style-type: none"> • Personalised neuroscience approach to performance improvement & talent development - specific |
|--------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------|

7. What business needs does neuro-agility address?

Workplace:

Neuro-Link assists people, teams and organizations with the following talent development imperatives:

- Talent selection
- Provide a predictive analysis for learning potential
- Enhance emotional intelligence
- Optimize performance improvement
- Talent development
- Leadership development
- Promote employee wellness
- Identify and minimize potential for human error
- Minimize fatigue
- Increase workplace flow
- Create workplace happiness

Education:

- Developing teachers and lectures through our assessments and learning solutions
- Learner/student development through our assessments and whole brain learning solutions
- Parent information sessions

Sport:

- Coaching support through individual athlete and team assessments
- Mental performance optimization through our assessments and learning solutions

Public:

- Assessments for children, parents and families
- **Motivational talks**
- **Public seminars**
- **Free information sessions**

8. Why should business pay attention to neuro-agility?

- It helps companies and individuals safeguard themselves against disruptive change;
- It provides powerful insights to business about which prospective work applicants will be the best asset to the company;
- The Neuro Agility Profile™ is a great tool to use to create individualized personal development programs;



- The Neuro Agility Profile® is the most comprehensive tool to measure the brain-based aspects that has to be measured to increase the ease, speed and flexibility workers need to be agile;
- The Neuro Agility Profile™ closes a gap on why individuals may error;
- It is a powerful tool to help managers align who people are with what they do;
- The NAP™ provides insight to managers about the unique contributions people can make in their team;
- It provides better business results and return on investment than ever before;
- It helps to separate facts from fiction in learning and people development practices;
- It is inclusive of culture, race, gender and generations and therefore relevant to global people development initiatives;
- It is the most comprehensive neuroscience framework for performance optimization and talent development.
- It improves performance, productivity, workplace engagement and happiness.

9. How can I better understand neuro-agility?

- Do the Neuro Agility Profile™ Practitioner Training Program offered by Neuro-Link
- Do the Introduction to Higher Neuroscience Coaching at the University of Pretoria

10. What is the scientific backing of neuro-agility?

Neuro-Link is committed to offering sound scientifically based assessments and solutions to our clients. The science behind neuro-agility, has a sound physiological basis and we see the results at work every day. Behavioural sciences are defined by use of systematic, empirical and critical investigation and observation of behaviours. These behaviours must have a scientific or physiological basis for their occurrence, as no action or response can arise from a non-existing force. Using neuroscience, we are able to tie the behavioural sciences into neuroscience. Stated differently, we observe certain behaviours and would like to understand why these behaviours occur. This is where neuroscience comes into the equation - to understand the 'why' of the behaviours.

Neuro-Link has no need to sway people with neuroscientific claims. The neuroscience has become an interdisciplinary science that is there for people to gain better understanding of their behaviours. Throughout the 20th century, there was a lot of resistance to entertaining brain/mind/behaviour patterns, but modern neuroscience, with its many well demonstrated neuroanatomical and neurochemical findings, can provide ways to evaluate these possibilities in more scientifically rigorous ways.

The unique Neuro Agility Profile™ assessment consists of many concepts that is fresh on the grid like the concepts of neurological design, neurological stress, dominance, neuro flexibility and neuro agility. Although these constructs can benefit from more



research, but this does not mean that the science behind them is new. The new concepts are based on fresh insights born from the development needs of people and businesses in a changing world, but the science behind these concepts are sound. There is a compelling body of scientific research that confirms the validity of these concepts.

One of the debated components of neuro-agility is the issue of left - right brain hemisphere labels. Prevailing research in neuroscience avoids the definite left-right brain labels, as many have oversimplified the conclusions of Nobel Prize Laureate Roger Sperry's discovery of the differences of left- and right brain hemisphere processing and learning functions. The problem is not that the research is incorrect, rather than misinterpretation of the implications of the research. Accurate interpretation requires a multi-disciplinary understanding of concepts like the influence of dominance and mid-line crossing on the functioning of the hemispheres, as neuroscience of learning is an interdisciplinary science. Few authorities offer this approach as most have very specific areas of expertise. Furthermore, many people are using incorrect verbal explanations and terminology that creates disparity between the research and implications. Scientists therefore now use the term "relative lateralization", as much of Roger Sperry's original work remains valid today.

It can still safely be said that the left hemisphere processes information in an analytical, sequential way, while the right hemisphere processes information in a random holistic way. Although we are using both hemispheres of the brain most of the time, it can also be said with impunity that at any moment, there will be more activity in one hemisphere than the other. It can also not be argued that some people starts solving problems by following a more logical, analytical approach and others follow a more conceptual, holistic and creative approach. All people think, learn, create and solve problems, but in different ways, depending on our preferences.

One will find many research papers concluding that there is evidence for left and right hemispheric preferences. There will also always be studies that do not achieve significant findings. What one should keep in mind, is that if a few research papers claim something is not true for the particular outcomes that they were trying to measure, it does not necessarily mean that the main concept is unfounded. We need to keep in mind what was measured, how was it measured, how big was their sample, what was their sample quantity, what methods did they use and ultimately, what were the defined objectives and limitations of the research conducted. All of these factors have an influence on the outcomes achieved by research.

When we talk about left and right hemispheric preferences, we do not define it as one hemisphere overpowering the other, but as one hemisphere taking the lead and the other following passively. This does not mean that we only use the "dominant hemisphere" and the other hemisphere is not working. All people use both hemispheres most of the time, making us whole brained people. There will however, always be a hemisphere actively leading in the task at hand and one passively following. For example, if asked about your hand dominance, you would either respond "right hand dominant or left hand dominant". When someone is right hand dominant, it does not mean that their left hand cannot be used. However, the right

hand feels more natural to use than the left hand, meaning that there is one actively leading and another passively following. The same would apply to the eyes, ears and brain hemispheres.

11. What are the neural substrates of neuro-agility?

A concept like neuro-agility does not have a single neuronal substrate. Neuro-agility is a conglomeration of many factors at play that need to be maintained and optimized. Neuro-agility consist of a framework of drivers that optimize people's brain performance and the neurophysiological components that influence how flexible they are to access any mode of learning, thinking or processing information, that a specific situation may require of them. Each of these neurophysiological components and drivers have neural substrates which will take many hours of neurophysiology training to explain.

12. How can I become a neuro-agility expert?

There are no quick fixes to neuroscience or understanding neuroscience related concepts. It requires many hours of intense training. Should one really be interested in becoming an expert in neuro-agility, it is highly recommended to take courses like the Neuro Agility Profile™ Practitioner Training that Neuro-Link offers or do the Introduction to Higher Neuroscience Coaching course, presented at the University of Pretoria.

13. What is Neuro-Link's position with regards to left-right brain hemisphere claims?

Prevailing research in neuroscience avoids the definite left-right brain labels as many have oversimplified the conclusions of Nobel Prize Laureate Roger Sperry's discovery of the differences of left- and right brain hemisphere functions, which is unwarranted by the literature. Scientists now use the term "relative lateralization", as much of Roger Sperry's original work remains valid today. It can still safely be said that the left hemisphere processes information in an analytical, sequential way, while the right hemisphere processes information in a random holistic way. Although we are using both hemispheres of the brain most of the time, it can also be said with impunity that at any moment, there will be more activity in one hemisphere than the other. It can also not be argued that some people starts solving problems by following an analytical approach and others follow a conceptual, holistic and creative approach. All people think, learn, create and solve problems, but in different ways, depending on our preferences.

You will find many research papers concluding that there is evidence for left and right hemispheric preferences. As you will know that there will always be studies that do not achieve significant findings. What one should keep in mind, is that if a few research papers claims something is not true for the particular outcomes that they were trying to measure, it does not necessarily mean that the main concept is unfounded. We need to keep in mind what was measured, how was it measured, how big was their sample, what was their sample quantity, what methods did they use and ultimately what were the defined objectives and limitations of the research

conducted. All of these factors have an influence on the outcomes achieved by research.

When we talk about left and right hemispheric preferences, we do not define it as one hemisphere overpowering the other, but as one hemisphere taking the lead and the other following passively. This does not mean that we only use the “dominant hemisphere” and the other hemisphere is not working. All people use both hemispheres most of the time, making us whole brained people. There will however, always be one hemisphere actively leading in the task at hand and one passively following.

For example, if asked about your hand dominance, you would either respond “right hand dominant or left hand dominant”. When someone is right hand dominant, it does not mean that their left hand cannot be used. However, the right hand feels more natural to use than the left hand, meaning that there is one actively leading when processing information and another passively following. The same would apply to your eyes, ears and brain hemispheres. Both hemispheres and senses should however be developed to function in a more balanced, integrated way. This is ultimately what neuro-agility and flexibility is all about. Even when a person functions on an integrated, whole brained manner, one hemisphere, eye, ear or hand will lead, while the other follows. It is part of our neurological design. Also it cannot be argued that when a person had a stroke, depending on where the damage occurred in the brain, that person will display stereo type behaviour directly related to the absence of that unique processing function of the brain where the damage occurred.

The opinion above is Neuro-Link’s stance on the left right hemisphere debate. There is not a better alternative solution on the table for relative lateralization. We see the evidence for people utilizing analytical or conceptual approaches to learning, thinking and problem solving in their jobs and relationships the whole time. Our NAP™ assessment validates that even when people display whole brain approaches to learning, thinking and problem solving, they have a preference to follow a specific approach to doing so, depending on their relative lateralization. We are therefore satisfied that the critical and creative modes of learning and thinking form part of normal human behaviour.

14. What is Neuro-Link’s position on “switching off” of certain brain regions?

Neuro-Link is not stating that stress will totally “switch off” the passively following hemisphere, as it is still able to drive biological functions associated with its regions. We define the “switching off” process as the less preferred hemisphere not being able to process information as effectively and accurately as it would under less stressful conditions, once again indicating that the drivers that optimise brain performance have a sound scientific basis which then stems into a behavioural response.

The result of disruptive change is that people are constantly experiencing feelings of burn-out, stress and fatigue. Short bursts of stress are not the problem. Continued stress and fatigue however, are the brain’s greatest enemies. During stress, the brain releases cortical inhibitors (chemical) that decrease or inhibit electrochemical

transmission in certain brain regions. Anything that causes to slow down the speed of electrical transmission between brain cells, is referred to as neurological stress. It causes the non-dominant brain regions to “switch off”, leaving the dominant brain regions to carry on with its primary functions. Stress thus limits people’s performance, learning effectiveness, information processing abilities, and overall learning agility, causing them to become either too logical (more left hemisphere) or too creative (more right hemisphere) oriented than the whole brain person they can and should be.

When people experience continued stress or fatigue (mainly due to lack of rest and sleep), their dominant senses opposite the dominant hemisphere will be adept at processing information. If their dominant senses are on the same side as the dominant brain hemisphere, their information processing ability may be inhibited and sensory transmission may become limited during stress or fatigue, causing neurological hindrances that may increase people’s risk for error.

15. What is Neuro-Link’s view on dominance?

Our human species have been designed with 2 brain hemispheres, 2 eyes, 2 ears and 2 hands, with the purpose of using both. We are all whole brained most of the time. Even if we are whole brained, MRI and PET scans prove that at a given time, there will be more activity in one hemisphere over the other. This visually illustrates what dominance is all about. All people have a dominant brain hemisphere, eye, ear, and hand. In this context, the definition for dominance is it is the hemisphere, eye, ear, or hand that leads, while the other follows more passively.

Prevailing research in neuroscience avoids the definite left-right brain labels as many have oversimplified the conclusions of Nobel Prize Laureate Roger Sperry’s discovery of the differences of left- and right brain hemisphere functions, which is unwarranted by the literature. Scientists now use the term “relative lateralization”, as much of Roger Sperry’s original work remains valid today. It can still safely be said that the left hemisphere processes information in an analytical, sequential way, while the right hemisphere processes information in a random holistic way. Although we are using both hemispheres of the brain most of the time, it can also be said with impunity that at any moment, there will be more activity in one hemisphere than the other. It can also not be argued that some people starts solving problems by following an analytical approach and others follow a conceptual, holistic and creative approach. All people think, learn, create and solve problems, but in different ways, depending on our preferences.

The eyes are the only part of the brain that is visible. It illustrates how the brain works. To illustrate dominance, one only must look at how the eyes function when processing information. If a person looks through a rolled-up paper at an object with both eyes, one eye leads (focuses), while the other follows. The dominant eye will be aligned with the rolled-up paper. This clearly illustrates that although the person looks at the object with both eyes, the dominant eye will actively process information while the non-dominant eye follows more passively.

Neurological dominance is a natural part of our design. All people have a unique genetic coding which will influence our predisposition towards which hemispheres,



and senses will lead (dominate) when processing information. When one person speaks to another, but the other person cannot hear clearly, it may be that the person who cannot hear clearly, may turn one ear towards the other person. This response indicates an auditory dominance response. It illustrates that although we have two brain hemispheres, eyes, ears, and hands, and use both to process information, there will always be a dominant brain hemisphere, eye, ear, or hand that takes the lead to process information actively, while the other one follows, processing information more passively. Just like the muscles you use must become stronger, so does the brain hemisphere and senses that lead when we process information and learn, become dominant. As people learn and develop, we strengthen neural networks that connect different brain regions and the senses we prefer to use, making certain parts lead stronger and others follow. As a result, we develop physiological preferences for using some brain hemispheres, brain regions and senses over others. These neural networks make it easier to think, learn and create in ways that are consistent in our preferences, hence the reason all people think, learn, and act in different ways.

A Neuro-Link response to feedback received about a specific article published on tips to improve brain performance

- The questions/ statements in blue are the respondents responses

16. It has become increasingly common for coaching companies to make use of “neuroscience-driven” methods which, as far as I can tell, have no basis in scientific fact.

It is correct that there is a myriad of coaching organisations who is talking about a neuroscience approach to coaching and actually are still doing what they have been doing previously, but just added a neuroscience flavour to it because it is the cool thing to do at the moment. This is however not the case with Neuro-Link. We are a boutique company, specializing in the neuroscience of learning. Our Neuro Agility Profile™ and learning solutions are grounded into the hard sciences like physiology and we have a neurophysiologist that is the head of our research. We are also part of the Neuroscience Research group of the University of Pretoria, the biggest research university in Africa, where we continually look at new research and its implications to people development and how we can help the world of business drive business results. Coaching is a very powerful practice to help people achieve their goals and change behaviour. A neuroscience approach to coaching, validates the coaching practice even more as it is inclusive of race, gender, culture and beliefs, something that is a pre-requisite to global people development practices

17. Whilst these coaching methods may be effective, I believe that the neuroscientific claims exist solely to make the justification of these methods more scientific sounding. For example, in your piece: get more sleep, eat better, exercise, laugh more, and reduce stress. These are all great things to do, which can undoubtedly improve productivity, but why do they require (incorrect) neuroscientific, rather than behavioural justification? Could it be that you feel like individuals are more likely to be



swayed by your arguments if you use neuroscientific claims, rather than behavioural ones?

This is not the case at all. We are not using neuroscience as a marketing fad because it is the flavour of the month. The World Economic Forum offers neuroscience as one of the accelerating forces of the 4th Industrial Revolution. Neuroscience will impact business, marketing, sales, learning and development, technological progress, medicine, happiness etc. profoundly in the future. This is why Neuro-Link is assisting people in the performance development and talent selection and development industries like FPG with aligning what they do with neuroscience, to ensure their practices and products are grounded in neuroscience. The brain is the key to our being. Everything happens inside the brain and is in some way connected to how the brain works. People exist on different dimensions. We are body, mind and depending on your belief system, spirit. Although these dimensions are named as 3 separate entities, they make one integrated being. Mind and brain can never be seen as two separate entities, as the brain is the home of the mind. The brain is flesh, chemistry, physiology and genetics. The mind is the sum total of our thinking, learning, behaviour, intelligence and emotions. Behaviour is anchored in the brain. They are intricately interconnected and should not be viewed as 2 separate entities that stand apart. This is why the neuroscience of learning does not have a pathology focus, but a development focus. The neuroscience of learning is an interdisciplinary science that integrates research from other sciences to develop people.

There is a compelling body of neuroscience research that provides strong evidence that ties improved performance to drivers like brain fitness, stress coping skills, sleep, movement and exercise, optimistic mind-set and nutrition. If optimized, these drivers can significantly improve our brain health, memory, focus, cognition and energy, thereby impacting performance, engagement, learning agility, well-being and overall brain fitness. It is therefore not valid to refer to these drivers as “(incorrect) neuroscience”

R & D manager response: I do agree with you that there are many companies using neuroscience, trying to back up their claims with neuroscience and sell their products. However I can assure you that Neuro-Link has never used neuroscience as a fad to do business. We specialize in the neuroscience of work place learning. We have been in business for more than 25 years. The information as stated in the article, has a sound physiological basis and we see the result of it at work every day. Behavioural sciences are defined by use of systematic, empirical and critical investigation and observation of behaviours. These behaviours must have a scientific or physiological basis for their occurrence, as no action or response can arise from a non-existing force. Neuroscience is science. To state that neuroscience driven methods have no basis in scientific fact would discredit not only neuroscience, but also the behavioural sciences, as many behavioural sciences methodology needs to be grounded in the hard sciences like physiology neurophysiology, genetics and chemistry, in order for it to be seen as validated. Using neuroscience, we are able to validate the behavioural sciences. Stated differently, we observe certain behaviours and would like to understand why these behaviours occur. This is where neuroscience comes into the equation - to understand the ‘why’ of the behaviours. Should neuroscience be left out of the equation, we will never be able to drill down to the deepest level of understanding the “why”.

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NAP Practitioner Training Program

Learning Content Guide

Version: 1.2

For each and every driver that you mentioned (get more sleep, eat better, exercise, laugh more, reduce stress), there is a physiological response occurring in the body and in the brain. For instance, when you laugh you produce neurotransmitters like dopamine, catecholamines and norepinephrine. These chemicals make it difficult to feel pain and be tense, thus breaking the stress-pain cycle. There has also been studies concluding that there is a relationship between positive emotional states and the immune system, making a link between mind and body, once again binding the behavioural state with neuroscience. This cannot be incorrect “neuroscientific justification” as you refer to it, if it has been scientifically proven by numerous studies. We have no need to sway people with neuroscientific claims. The neuroscience is there for people to gain better understanding of their behaviours. Throughout the 20th century, there was a lot of resistance to entertaining brain/mind/behaviour patterns, but modern neuroscience, with its many well demonstrated neuroanatomical and neurochemical findings, can provide ways to evaluate these possibilities in more scientifically rigorous ways.

18. I am particularly concerned that your statements in the BA Business piece, which acts as an advertisement for your services, are at best unfounded, and at worst intellectually dishonest. You state the infamous “left brain/right brain” trope, which has little evidence to support it. This “neuro-myth” is quite pervasive, but dismissed outright in any introductory neuroscience text book. To suggest that individuals have a dominant hemisphere supporting “big-picture thinking” or “logic”, and that stress can “switch-off” an entire hemisphere of the brain, is an interesting claim.

I am unclear to what qualifies you as an authority to claim our services are “at best unfounded, and at worst intellectually dishonest” Prevailing research in neuroscience avoids the definite left-right brain labels as many have oversimplified the conclusions of Nobel Prize Laureate Roger Sperry’s discovery of the differences of left- and right brain hemisphere functions, which is unwarranted by the literature. Scientists now use the term “relative lateralization”, as much of Roger Sperry’s original work remains valid today. It can still safely be said that the left hemisphere processes information in an analytical, sequential way, while the right hemisphere processes information in a random holistic way. Although we are using both hemispheres of the brain most of the time if we are not under stress, it can also be said with impunity that at any moment, there will be more activity in one hemisphere than the other. It can also not be argued that some people start solving problems by following an analytical, logical approach while others follow a conceptual, holistic and creative approach. This is not a coincidence. The reason for having different approaches in thinking and learning is anchored into physiology, genetics and chemistry. All people think, learn, create and solve problems, but in different ways, depending on their unique preferences that are born from their neurological design.

R & D manager response: The statement made “are at best unfounded and at worst intellectually dishonest” discredits valuable work done by researchers in the field of neuroscience. You will find many research papers concluding that there is evidence for left and right hemispheric preferences. As you will know that there will always be studies that do not achieve significant findings. What one should keep in mind, is

that if a few research papers claims something is not true for the particular outcomes that they were trying to measure, it does not necessarily mean that the main concept is unfounded. We need to keep in mind what was measured, how was it measured, how big was their sample, what was their sample quantity, what methods did they use and ultimately what were the defined objectives and limitations of the research conducted. All of these factors have an influence on the outcomes achieved by research. When we talk about left and right hemispheric preferences, we do not define it as one hemisphere overpowering the other, but as one hemisphere taking the lead and there other following passively. This does not mean that we only use the “dominant hemisphere” and the other hemisphere is not working. All people use both hemispheres most of the time, making us whole brained people. There will however, always be one hemisphere actively leading in the task at hand and one passively following. For example, if asked about your hand dominance, you would either respond “right hand dominant or left hand dominant”. When someone is right hand dominant, it does not mean that their left hand cannot be used. However, the right hand feels more natural to use than the left hand, meaning that there is one actively leading when processing information and another passively following. The same would apply to your eyes, ears and brain hemispheres. Either hemispheres or senses can however be developed to function in a more balanced, integrated way. This is ultimately what neuro-agility and flexibility is all about. Even when a person functions on an integrated, whole brained manner, one hemisphere, eye, ear or hand will lead, while the other follows it is part of our neurological design. Also it cannot be argued that when a person had a stroke, depending on where the damage occurred in the brain, that person will display stereo type behaviour directly related to the absence of that unique processing function of the brain where the damage occurred.

19. To suggest that individuals have a dominant hemisphere supporting “big-picture thinking” or “logic”, and that stress can “switch-off” an entire hemisphere of the brain, is an interesting claim.

R & D manager response: Neuro-Link is not stating that stress will totally switch off the passively following hemisphere, as it is still able to drive biological functioning associated with its regions. We define the “switching off” process as the less preferred hemisphere not being able to process information as effectively and accurately as it would under less stressful conditions, once again indicating that the drivers that optimise brain performance have a sound scientific basis which then stems into a behavioural response.

20. So is the suggestion that mental activities encourages “greater flexibility” between the hemispheres (whatever that means). Do you have any evidence to support these statements? Do you have any evidence to support your claims that visualising positive outcomes can “create new neural pathways”, beyond the changes in neuronal connectivity that occur with any process that occurs in the brain?

R & D manager response: We have not used technical jargon in this article, as most people have no direct interest in neuroscience, but only want to understand how these concepts apply to them. What flexibility means, is that there is a distinct structure between the two brain hemispheres, formed by axonal fibres of >200



million, which is the largest inter- hemispheric, white matter fibre bundle in the brain, providing a pathway for information transfer between the two cerebral hemispheres. When we engage in mental stimulation activities, we strengthen these pathways and also form new pathways. It therefore creates greater flexibility and information transfer between the two hemispheres. The more effectively the two hemispheres communicate with one another, the easier it becomes to process information fast and easy and execute different tasks with flexibility, regardless of the specific hemispheric functionality required.

21. Do you have any evidence to support these statements? Do you have any evidence to support your claims that visualising positive outcomes can “create new neural pathways”, beyond the changes in neuronal connectivity that occur with any process that occurs in the brain?

R & D manager response: Yes, there is vast amounts of research that has been conducted on neuroplasticity with positive and negative visual stimulus of animal models, as well as humans. Neuroplasticity can be defined as the ability of the brain to either reorganise, reform or form new pathways or synapses to different regions of the brain when exposed to different stimuli. Visualisation helps in strengthening these pathways, whether they be positive or negative. The visualisation causes a cascade of chemical events to occur, releasing neurotransmitters like dopamine that bind to the dendritic receptors of the cell body resulting in a depolarisation effect to occur, producing an electrical signal. When this occurs numerous times, the release of the dopamine concentration may minutely increase over time, strengthening the pathways or making new connections with stronger electrical impulses to and from different brain regions like the hippocampus, a memory and emotion associated structure, thus helping an individual to make associations between emotions, memory en executive functions (frontal lobe areas). This physiological response has an influence on the behavioural response output, depending on the positive and negative emotional gradient of the stimulus.

22. It appears to me that if you have any background in neuroscience, which really should be a pre-requisite for taking peoples’ money based on neuroscientific claims, then you would have recognised the statements in this piece as unfounded. If this is the case, then you are lying to potential clients. If you do not have the requisite background, then you are not fit to make such claims, and should not be making them!

In Neuro-Link we have sufficient neuroscientific background and validation for our articles, books, statements, assessments and learning solutions. Neuro-Link ensures that we provide sufficient training and back up to our partners, like FPG, to deliver sound, scientifically based assessments and products. Tiaan Vermeulen is the manager of research and development for Neuro-Link. He is a neurophysiologist majoring in human physiology, genetics and psychology, furthering his career by having completed an honours degree in neurophysiology and neuroanatomy. He is furthering his studies in neurophysiology and neuroanatomy, conducting a study on morphological changes of the corpus callosum in normal schizophrenic and bipolar patients. He is very much involved in the world of academics and research. Neuro-Link is also represented in the Neuroscience Research Group of the University of Pretoria, as Dr. André Vermeulen, CEO of Neuro-Link is part of this group, being



responsible for translating neuroscience research into practical tools for the world of business.

Providing a constructive critique of the article in question, stating sound scientific alternatives to what is claimed as “unfounded”, is normally common practise in research and academics, but have not been offered in this response. Please refer to the work of R Sperry, KM Dillon, S Rauchman and j Averill to gain a better understanding on the factors discussed in the article.

23. Finally, I would definitely appreciate an explanation of neuro-agility. What is the scientific backing for this proposed phenomena? What are the neural substrates? How can I become an expert in neuro-agility?

Neuro-agility is a fresh construct that addresses the brain-based factors that impact the speed, ease and flexibility with which people process information, which allows you to apply previous experiences in new first time situations and still innovate and progress in stressful situations. A concept like neuro-agility does not have a single neuronal substrate. It is a conglomeration of factors that need to work and be maintained at optimal levels. Neuro-agility consist of a framework of drivers that optimize people’s brain performance and the neurophysiological components that influence how flexible they are to access any mode of learning, thinking or processing information, that a specific situation may require of them.

Each of these neurophysiological components and drivers have neural substrates which will take many hours of neurophysiology training to explain, as was done with FPG. There are no quick fixes to neuroscience. Should you really be interested in becoming an expert in neuro-agility, I highly recommend you take courses like the Neuro Agility Profile™ practitioner training that Neuro-Link offers, as the Full Potential Group did, or do the Introduction to Higher Neuroscience Coaching course, presented at the University of Pretoria.

24. I hope you can find time to address my questions, and alleviate my concerns that you are not, like many other “neuro-coaching” companies, incorrectly, unnecessarily, and dishonestly co-opting neuroscience to better sell your product.

From the above response, I trust you will realize that we do not take any such response lightly. We tried to respond with integrity, honesty and truthfulness. We pride ourselves in the work we do and the results we have achieved. If we conducted dishonest, unethical business, we would not have existed for over 25 years

Some thoughts on receiving negative comments or people debunking neuro-agility

With neuro-agility we are breaking new ground. Responses like the above one is not uncommon. First adopters like Neuro-Link Partners, will encounter these types of responses from time to time, but we do not have to be discouraged by them. We just need to deal with the responses ASAP. This is why we are educating the market

about this new concept through the articles we are publishing. We need to take people from a level of unconsciously incompetent about neuro-agility to consciously incompetent, to competent. The responses in the above email seems to be that of a person who is still unconsciously incompetent about neuro-agility, so let's help move people to the next level, but first some thoughts on people debunking concepts.

Factors we should consider when people debunk neuro-agility:

1. Neuro-Link is committed to science, facts and the truth. We should therefore always be critical in our evaluation of new concepts like neuro-agility, but also at all times, practice possibility thinking and maintain a growth mind-set. After all, this is what neuro-agility is all about – not just maintaining one mode of thinking like critical thinking, but maintaining whole brain thinking that is inclusive of different modes of thinking like maintaining an innovative mind-set at the same time. Should we differ in opinion of a concept, the Neuro-Link Way is to respond in the best possible emotionally intelligent and constructive way.
2. We should consider the person's motive for debunking the concept. Is it expertise, curiosity, personal ambition, professional jealousy, sinicism, open mindedness to wanting to learn more? What does the person stand to gain by debunking the concept? If you have an answer to this, it will determine the seriousness and depth you will have to go into in your response.
3. Consider the person's level of expertise knowledge and experience. Is the person an authority in the subject of discussion? Does the person have a multi-disciplinary understanding of the subject? I sometimes talk to neurologists who have a pathology focus. They understand the medical implications of brain areas but do not have training or understanding of the development implications of the brain. So although the person may be a medical expert on the brain, the person will not be an authority with regards to the development implications of the brain and is therefore not in a position as an expert to debunk a development concept. Look if the comments and remarks of the respondent indicated consistency of expertise on any level in the field of neuroscience or coaching.
4. We have to consider accurate understanding and reasoning in a person's argument. Sometimes people are just argumentative, cynical, not realistic or logical, make the wrong assumptions or have inaccurate understanding of the meaning of the specific concepts of discussion.
5. We need to be mindful to not throw out the baby with the bath water. Science should as much be committed to a growth mind-set , where we are curious, creative, optimistic, solutions oriented, consider possibilities and opportunities and holistic in our thinking and approaches, as we are to being critical and analytical in our approaches and thinking.

6. We also have to ask ourselves what the alternative is to debunking a concept. Do I have a better alternative solution than the one on the table? A constructive critique should try to offer that.
7. Another factor for consideration, is to determine if the person is really open minded, curious and willing to change their opinion when effort is made to explain the science. If the person is not willing to be open minded, no effort on our side will anyway convince them and any effort from our side will be time wasted. If the person really is open minded and curious to know more, they will do their own homework to discover and learn more. We will then not have to do all the learning on their behalf.

Please note that it primarily stays the responsibility of the person who does not agree with the principle, to do their own homework and take responsibility for their own learning. Neuro-Link will always adhere to our responsibility to deal with criticism, if we think it is valid or challenges our integrity, as we have an ethical obligation to educate the market. In my experience, however, I do sometimes encounter individuals who are not really interested in the correct answer and wanting to learn more. It is sometimes just a negative response or mind-set which does not deserve a lengthy and timely response.

A second comment from the same article

I can confirm that the effect of alpha waves as a resting state is very out of date. You actually want alpha waves for active inhibition of non-relevant area (In-house comment only for us: the above statement is contradicting. It is agreed that active inhibition would occur in alpha state, meaning that it would decrease mental activity in specific areas, however resting state can be seen as deceased mental activity proving that alpha state correlates to a resting state with more focus/alertness.)

The sentence is contradicting as the individual states that “alpha waves as a resting state is very out of date”, meaning that alpha state is not applicable to a resting state, however it is the state before theta state where one might become drowsy. Alpha state is a resting state, but one is still able to maintain focus on the task at hand. It is a state of relaxed alertness. The active inhibition would take the individual into an actively resting / relaxed state. Alpha state can be seen as the bridging state between the conscious and subconscious mind, meaning that while one is consciously learning, their brain is also unconsciously processing what one is learning. The active inhibition of non-relevant areas is also needed to help maintain Alpha state power across hemispheres. Research suggests that 1 of 6 of our brain’s processing methods happen on the conscious level, so there is certainly a benefit in engaging the deeper parts of the brain, while taking in information thus confirming the importance of alpha state.

Numerous research has been conducted on brain waves, specifically alpha waves. There are various opinions on this matter, but most studies are in agreement that alpha waves would be considered the most conducive for learning. There are studies suggesting pulsed inhibition of non- relevant areas to permit a degree of priority in stimuli processing. These studies have also found that increases in alpha have been linked to the successful inhibition of distracter items to aid working memory. More

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recently, research has also shown that the degree of alpha lateralization of the two hemispheres, or its involvement in sensory inhibition is modulated by attention, thus these controlled fluctuations in alpha have in turn been shown to influence target detection and visual performance.

The alpha state (8-10Hz) occurs when brain activity decreases just below the normal waking state of Beta (11-25 Hz). In alpha state, the mind and body are mostly relaxed but a level of focus or concentration could easily be maintained, therefore making it easier for us to process information consciously without using too much energy. As the research suggests, alpha state is a very well rounded state to find oneself in as there is a balance between absorbing / processing the information, understanding what is being processed, being focussed and still conserving energy.



Please note: The techniques and activities suggested in this Manual are solely for educational training and/or self-development processes. The author and Neuro-Link do not directly present any part of this manual as a diagnosis or as a prescription for any ailment for any learner or worker. Persons using the profiles, techniques and activities reported herein, do so for educational, training or self-development purposes only.

The information provided in this manual and in the NAP™ report is based solely on data developed from the Neuro-Link Neuro Agility Profile® assessment. It should be interpreted in light of other information that is available about the individual and should never be used as the sole basis upon which to make a hiring, development, or promotion decision. To make an informed decision about whether this individual is likely to be successful with your organization, Neuro-Link advises you to use this report in conjunction with other knowledge about the candidate, particularly information from the individual's interview, résumé, and application as well as feedback from references.

