Part 1: The brain science of Emotional Intelligence

Emotional Intelligence (EI) by its title involves feeling (emotional) and thinking (intelligence), both of which are created and experienced within the brain and the body. If we are then to justify the definitions and claims currently being afforded to EI we must make a case for these at a biological level. The purpose of this paper is to examine the neurological basis for EI to help confirm (or to challenge) the conceptual faith often given to the many different definitions, theories and products used to apply Emotional Intelligence.

Some of the different models describe EI as a set of attitudes, skills, competencies, personality traits, cognitive capacities and so on. Of these I believe that our own definition which emphasises attitudes as the key determinant in how we apply our thinking and feeling to our behaviour is the most relevant and accurate when judged against the neurological evidence. Our own definition of EI is “the practice of using thinking about feeling and feeling about thinking when choosing what to do. “Our capacity to do this is strongly influenced by the pattern of our most fundamental attitudes, particularly our regard for ourselves, and for other people in general.

This paper is in two parts, part 1 explains the neurological processes behind EI and part 2 looks at how the neurological processes can be applied in developing EI.

The evolution of the brain

To begin this analysis I will describe the evolution of the brain as illustrated by the triune brain model (Paul Maclean, 1973)*. This model divides the brain into three broad evolutionary stages from the Reptilian, to the Mammalian to the Primate. The earliest Reptilian part of our brain is the central nervous system which as basic creatures enabled us to complete the primary survival functions of fight, flight, freeze and reproduction. As we evolved from reptiles to mammals we developed more advanced neurological functions. A significant development here was our limbic brain in which emotions are created that reinforce learnt behaviour through Stimulus Response conditioning, i.e. reward encourages and pain discourages behaviour. As we evolved into human beings our capacity for conscious choiceful thought developed through the growth of the neo cortex (the Primate brain). Unlike computer software, human beings are unable to dispose of outdated technology and replace it with new; evolution means we build upon and retain our primitive neurology. In our day to day lives, from routine habits to in-depth thinking we are greatly influenced by our reptilian instinctive brain for survival and our emotional limbic brain for our well being.

(*Maclean’s model is clearly an oversimplification of the brains evolution, as natural selection has reprogrammed all parts of the brain to work in combination, however the principles of there being different parts of the brain that evolved to focus largely on instincts, feelings and thinking is still in the authors view a relevant and useful separation of its functions.)
Recognising the brain's evolution provides a useful explanation for our definition of Emotional Intelligence. Because the brain evolved outwardly there are more connections from the deeper limbic (feeling) brain to the neocortex (thinking brain) than from thinking to feeling. Therefore the more primitive instinctive and emotional parts of the brain often exert greater influence over our thinking than our thinking does over our feeling. As a result, instinctive drives and behaviours (from our reptilian brain) such as breathing, the alarm response and sexual desire are mostly irrepressible, and strong emotional urges (from our limbic brain) such as phobias are also difficult to overcome through rational thought. For example, a person with a phobia of spiders or flying may consciously know (in their neocortex) that the spider will not hurt them or the airplane is unlikely to crash but may still hold the emotional fear. The key point here is that, rather than being dominant, our thinking can be subservient to and is largely influenced by our feeling. This notion challenges the Cartesian philosophy of 'I think therefore I am' which has pervaded Western society in general, and can be seen particularly in therapy (Cognitive behavioural), education (IQ), and business (objective decision making).

Making decisions would be near impossible if we had no emotional attachment to them. Emotions tell us what we want, like and desire; without emotional impulse there would be no conviction or confidence in any decision. This has been neatly demonstrated by Antonio Damasio (1994) a neurosurgeon who describes a patient who had a lesion between their emotional (limbic) brain and their thinking brain (neocortex). In this case the patient retained their ability to think and to feel normally, but could not combine the two (to think about their feeling and feel about their thinking). As a result he was unable to make even the most basic decisions without laborious analysis, and was almost entirely lacking in sound wisdom or judgment. Emotions help guide our thinking; they provide both a sense of conviction to our decision making, as well as a wealth of deeper intuitive knowing about what is best, right or wrong. An interesting aside to this is ‘neuroeconomics’ which examines how people make decisions based on rational and irrational forces. For example, given the choice of accepting a share of £10 or getting nothing, people will often turn down what they see as an unfair share.

Based on economic theory people always try to maximise their rewards, yet in practice our decision making is strongly influenced by our emotions.

The importance of how our feeling and thinking brains work together will continue to be explored in the next part to this paper.

How the brain processes attitudes, thoughts and feelings

Let us now consider how thoughts and feelings are processed within the brain. Any given stimulus is initially received in the brain through the sensory thalamus (Greek for doorway) which is instantly scanned by the amygdalae for any potential danger. If the amygdalae identify the stimuli as a serious threat, they will send a powerful emotional response for us to act upon the perceived danger. This emotional response has a direct link to the fight and flight behaviour[1] by-passing the thinking brain. The primary function of the amygdalae is to keep us safe; in evolutionary terms, if we stopped to think then we might be eaten by the grizzly bear. Thus when we have what is called by Daniel Goleman an ‘emotional hijack’, our thinking is literally incapacitated.

Note 1: the Amygdalae (Mammalian brain) fight or flight response is learnt, so differs from the Reptilian brain fight or flight response which is instinctive.
The amygdalae may be likened to a security guard who has the power to press the alarm and evacuate the building (flight) or lock the doors (freeze). Such a life saving response is fine if we are in real danger, but unfortunately the amygdalae have a long memory for any past events that may have caused us fear or shock. From the day we are born there are bound to be all sorts of frightening people, situations and stimuli which are no longer a real danger, yet once a match is made, this can be etched onto the amygdalae as a permanent memory, which will trigger off the same fear response if ever a similar stimulus is presented. This can be seen when people develop phobias, irrational fears, post traumatic memories and with most excessive emotional reactions we have. In each case thinking is bypassed and we respond emotionally.

Having been 'checked through security' by the amygdalae for any danger, stimuli are then matched up with the emotional reactions generated by earlier experiences of such stimuli within the limbic brain, or - Joe Griffin believes (see below) - with emotional reactions generated by our innate instincts (innate knowledge). These connections between particular stimuli and positive or negative feeling constitute what we tend to refer to as attitudes. After the percept (i.e. what has been perceived) has been tagged with the emotional significance stored as an attitude in the limbic system, percept and attached emotional tag are forwarded together to the thinking brain (neocortex) and out into the body. Within the neocortex percept plus emotional tag are initially received by the anterior cingulate which acts rather like the MD's 'secretary' dealing with most required responses without having to alert our conscious mind - the 'boss' (dorso lateral pre-frontal cortex). As long as the required action is familiar, i.e. a habit, the 'secretary'
will fire off the necessary neural network that initiates the appropriate behaviour without disturbing the 'boss'.

This explains how the majority of our behaviour is automatic and driven by unconscious emotional impulses originating from our attitudes. Even the most mundane behaviours have an emotional and attitudinal root which, as long as we act upon them and fulfill the emotional expectation, passes us by unaware. If however we did not follow our impulse, then the feeling would steadily increase, often becoming overpowering. This happens for example when we try to change a habit, which can be tremendously difficult, such as stopping smoking, picking our nails, interrupting people, or being defensive.

Not all behaviour is habitual and automatic; as humans we have the unique capacity to be self aware and make conscious choices. Our 'boss' (conscious thinking brain) can choose to become involved, such as when we decide to change a habit, become aware of our feelings or think about our behaviour. Our 'boss' is also alerted to pay attention when we learn something, are faced with a decision, or presented with a new situation.

Let us now review the entire neurological process from stimulus to response. Stimuli are initially connected with their emotional significance through a pattern matching process in the limbic (mammalian) brain, and checked for possible danger in the amygdalae. A pattern match will attach an 'emotional tag' and send the percept with emotional tag attached to the thinking brain (neocortex), where it is either processed unconsciously (by the 'secretary'/ anterior cingulate) as an automatic habit, or else we become aware of the feeling and consciously choose our response (through our prefrontal cortex), then take action which results in an outcome. In terms of EI the intended outcome is to be both personally and interpersonally effective.

Example:

| stimulus | colleague criticises my work |
| pattern match | 'I am incompetent' |
| emotional tag | deflated |
| thought | 'Why should I bother?' |
| behaviour | I make less effort |
| outcome | my performance gets worse |

Although this explanation may be sequential and reductionist, in practice all these processes are happening almost instantaneously, interdependently and continuously. The brain may be likened to a quivering web with millions of synaptic firings passing through it at every moment. The different parts of the brain are linked and multifunctional. The cortex, limbic system and reptilian brain are all connected by the Orbit frontal cortex; the neurons (spindle cells) within this region are also highly receptive areas which ensure super fast transmissions. This enables information from the different regions of the brain to be instantly integrated explaining how we make snap judgments such as knowing if we like or dislike something before we know what it is.

A key benefit from understanding the neurological processing of thoughts and feelings is that it helps us understand how to develop EI. This may include: changing the cause (stimuli), our thinking (cognition of the neocortex), our feelings (affect in the body), our attitudes (patterns in the limbic brain), and our behaviour (habit change) and outcomes (e.g. visualisation). All of these are discussed in part 2 of this article.
This neurological explanation of EI shares the same component parts (thinking, feeling and attitudes/patterns) as our own EI definition, but contrasts with other EI theories. For example, cognitive EI models focus mainly on the neocortex, personality/trait EI models focus mainly on habits (neuronal networks) and competency EI models focus mostly on the outcomes of behaviour. At the heart of the neurological model and our EI definition are attitudes, which are emotionally based and reflect the pattern of emotional tagging in the limbic system of groups of stimuli, and which determine much of our thinking, feeling and behaviour. It is this that I will now go on to describe.

How attitudes form in the brain

The term 'pattern matching' was used by Joe Griffin (1997), a dream researcher, to explain his theory of how the brain perceives, interprets and gives meaning to stimuli. A pattern match occurs when a stimulus is recognised in the limbic system as belonging to a previously identified class of stimuli. Griffin also believed that sometimes the new stimulus is matched to templates that are innate rather than the product of earlier learning. Each pattern is tagged with an emotional significance and response tendency that is released once a pattern has been matched. The emotional tag takes the form of a neurochemical messenger molecule which stimulates a response in the higher parts of the brain, thus forming a connection between the feeling (limbic) brain and the thinking (neocortex) brain. The emotional tag which is attached to a pattern may be seen as the neurological equivalent of an attitude. Our definition of an attitude is ‘an evaluative position towards a person, group, idea etc’. A pattern is certainly this, because patterns with their tags are evaluative in that they release an emotional response e.g. a like, want, dislike, fear, etc, and they are towards (or in response to the perception of) any given stimulus.

Stimuli are not only external such as another person's behaviour, but can also be internal such as our own thoughts. In other words, our thinking can act as a stimulus for further pattern matches so the process is cyclical and can begin at any stage; a stimulus creates a pattern match that is tagged with an emotion that can trigger a thought which in turn becomes an internal stimulus and so on.

Our definition of an attitude also qualifies 'an evaluative position' as ‘being based largely on feeling, with related thinking/ beliefs that strongly influence our behaviour’. The same may also be said for all the various psychological constructs that elicit emotional responses such as values, scripts and metaprogrammes etc.

What makes us Emotionally intelligent is our capacity to be self observing (self aware) and to consciously intervene in any of these parts, e.g. to change our thinking, to manage our emotional state, to choose our behaviour, and ultimately to change our patterns / attitudes.

Joe Griffin (1997) proposed that we form our attitudes, tagging our patterns of perception with emotional significance in the course of our Rapid Eye Movement sleep, the periods of sleep during which we dream. This he termed the ‘Expectation fulfillment theory of dreaming’, i.e. any unfulfilled expectations from the previous day are metaphorically acted out in our dreams. He concluded that during REM sleep we work through and discharge any unresolved emotions from the previous day, through our dreams. This both preserves the integrity of our existing patterns and allows new patterns to be made.
or reconfigured. At a cellular level updated patterns literally change the brain chemically with new protein synthesis (LeDoux, 1988). Patterns are formed throughout our lives; new born babies have to form many new patterns so spend some 80% of their sleeping time in the REM state compared with 25% for adults. The process by which we form patterns while dreaming may be seen as nature’s way of coping with anxiety. However, REM sleep can only manage so much anxiety before we suffer negative consequences.

A person who experiences a lot of anxiety or stress will need to spend more time in the REM state to work though their unresolved emotion. The REM state is characterised by firing of the orientation response which has the purpose of focusing our attention and activating our imagination in the right hemisphere of the brain which enables us to dream. Because of this ‘alerting response’, dreaming sleep is not restful and can leave us feeling tired if we do not get sufficient recuperative non REM sleep (stage 3 & 4 delta wave sleep restores glucose and builds the immune system). This is why people who are depressed will sleep for a long time, engaged mostly in REM sleep, yet still feel tired when they wake up.

Also, because their orientation response is exhausted they find it difficult to focus their attention and engage in daily life. If we feel tired in the morning then we will be less able to cope with the following day’s stressors, which will build up more unresolved anxiety and so require more REM sleep the following night, which perpetuates the cycle. This will eventually lead to extreme tiredness with high levels of unresolved anxiety, sleep problems, general exhaustion and depression. If the person’s anxiety continues then they will require so much REM sleep that they may wake up still in the REM trance. In this ‘waking sleep’ they may be unable to distinguish dreaming from waking reality and suffer psychotic symptoms such as hallucinations (waking dreams) or hearing voices, which can be explained as the left hemisphere (language centers of the brain) communicating with the right hemisphere (dreaming imagination centers of the brain) and catatonia (a natural occurrence during REM sleep of numbing the senses and paralysis, to avoid physically acting out our dreams). The key to recovery and avoiding stress related problems is to manage our level of arousal during waking hours. For normal anxiety levels the REM state will do this but when anxiety is high we need to actively manage our emotional state. The importance of this is not just for mental health but for maximising our day to day performance in work and life in general, which is the next section to this paper; the implications of brain science on how we develop our Emotional Intelligence.

Section 2: Applying brain science to developing EI

As a way of looking at the development of Emotional Intelligence I propose to examine in turn each of the following five stages of the stimulus – response – outcome process:

1. Stimulating / Activating
2. Pattern Matching and Emotional Tagging (attitudes)
3. Thinking
4. Body and Behaviour
5. Outcome
1. Stimulating/Activating

The stimulus or activating agent is the first element in the process, and may be internal (feelings and thoughts) or external (another person’s behaviour or the environment). The stimuli are instantly matched in the limbic brain with a previously experienced pattern and innate knowledge, and this matching elicits the emotional response (reflecting our attitudes) associated with that pattern, which in turn leads to our behaviour. By changing the stimuli we can therefore change both our emotional response and our behaviour. To give an example, one successful method we have found for inducing positive behaviour change in adolescents has been to change their environment. If we ensure that the room they first enter is tidy and cared for the attitude elicited in the teenagers entails ‘This is a place where people are polite and tidy’. This is reinforced by firmly setting out ground rules of behaviour at the outset. Setting the boundaries early is essential to create the desired attitude and to ensure the same emotional and behavioral response. Different stimuli elicit different patterns and behaviour; this can be easily seen in the case of those children whose discipline varies dramatically depending upon the class or teacher they are with.

Associating stimuli with a person’s emotional state can also be used as an effective way to change a person’s mood. The term “anchoring” refers to the association of a physical or environmental cue with a positive emotional state, for instance by recalling happy memories and feelings while, say, clasping your hands together. After sufficient repetition the anchor or stimulus of clasping your hands together automatically associated with the physiological response of positive feelings.

Anchoring is a natural phenomenon of the limbic brain which is programmed to emotionally predict and anticipate whether a particular stimulus will be good or bad for us. Throughout our lives the limbic brain is forming new patterns and attitudinal links to help look after us, keep us safe from danger, guide our behaviour and maintain our self esteem. Our patterns and attitudes are formed based largely on past experiences in order to help us predict future events. The emotional response that is tagged to the patterns represents our attitude towards the given stimulus. This emotional tag acts as an emotional expectation guiding us on what to expect and how to respond e.g. if we recognise something as dangerous we experience fear, if we recognise someone as a friend we experience warmth. This is why we can feel so uncomfortable when dealing with uncertainty or with people who are inconsistent and hard to read, as we have no clear correspondence between the current stimulus pattern and any one of our stored patterns, or maybe even the current stimulus pattern reminds us of different stored patterns with conflicting emotional tags. Pattern matching is largely a stimulus-response action, so until or unless we engage conscious thought much of our behaviour is very much conditioned and based on presented stimuli being matched with past experience. EI involves knowing and being aware of our emotional responses to stimuli, and choosing how to change our responses or change our circumstances. For further discussion of how EI may be developed through changing our stimuli refer to stage 5 on Outcomes.

2. Pattern Matching and Emotional Tagging (Attitudes)

As explained earlier, pattern matching is the process by which information having been perceived is matched against past experience and innate knowledge. This in turn fires off an emotional reaction in the form of neurochemical into the higher (thinking) brain.
and may be experienced as feelings within the body. It is the emotional tagging / connection made with the pattern match that reflects our attitudes. Pattern matches and emotional tagging happen regardless of whether we want them to or not, in extreme cases such as with post traumatic stress, a phobia or an emotional outburst we experience an emotional hijack response.

Before we can change such unhelpful and exaggerated emotional responses we must first identify what is the stimulus (activator) and what attitude is causing the emotional response to the pattern match. Feelings provide us the feedback as to our attitudes. For example if I feel alarmed each time I see my boss, this may indicate an attitude I hold to that person (e.g. I don’t trust them), or more generally to people in authority (e.g. they don’t like me).

There are a growing number of therapeutic and developmental interventions that focus directly on changing our attitudes (the emotional connection we make to a pattern match) such as the rewind technique, disassociation (an NLP ‘neuro linguistic programming’ technique), thought field therapy (also known as tapping), eye movement desensitisation (EMDR) and the swish technique. They all have one thing in common: they require the individual to re-experience the same event while maintaining a different (usually calmer) emotional state. To give one example, the rewind or disassociation techniques involve the individual imagining watching themselves sitting in a chair watching a video recording of the event that causes the emotional response to the pattern match. Before this they will usually be guided into a very calm emotional state, then be asked to see the image in black and white with silly music playing, while they use a remote control to rewind and forward the memory on the TV screen. All of these actions allow the person to be sufficiently disassociated from and in control of the experience that they remain calm while re-experiencing the event, thus a new emotion is tagged to the pattern.

One technique that has proven to be highly effective for changing peoples' automatic emotional reaction to events i.e. the results of pattern matches is ‘tapping’, which involves tapping meridian points around the body. Meridians are often described vaguely as energy channels; it may be that these points have a more direct physiological connection with the limbic brain where our patterns and emotional tags are stored. Tapping, as with any rhythmical movement or sudden noise, also activates the orientation response (called the PGO: ponto-geniculooccipital, within the brain stem), which focuses our attention creating a mini trance, making us more receptive to suggestion. Having engaged the pattern matching limbic brain, the person makes an affirming statement such as ‘even though I have this fear of presenting this paper, I chose to feel confident and calm’. Our receptive limbic brain will automatically and unconsciously attempt to reconcile this statement with their existing pattern match. The existing pattern match and associates feeling (fear of presentations) will be replaced with the new associated feeling to the pattern match (feeling calm and confident). When the individual next thinks about or delivers the presentation, the new associated feeling will be activated.

Another aspect to tapping that also comes into many other techniques for changing attitudes is the use of abstract language. This often involves using nominalization where a verb is turned into a noun e.g. ‘we put investment into our staff ’, ‘I have real anger’, and ‘you have great inner resources’. None of these statements include anything real but we
all form our own interpretation and meaning around them as the limbic brain searches for a pattern match. This can be very powerful if we make positive suggestions to people, because the person cannot help but look for positive patterns at an unconscious level, for example ‘you have great potential and opportunity to fulfill your dreams’ will mean different things to everyone but will nearly always be positive. Nominalisations are typically used in political or motivational speeches to produce the desired effect even though no factual information has been conveyed e.g. ‘education, education, education’ could mean more money to one person, more teachers to another or less bureaucracy to someone else, or whatever our unconscious brain wants it to mean.

Similar in process to nominalisations are metaphors or stories which engage the limbic brain and right hemisphere to search for meaning and pattern matches. The right hemisphere is the side of the brain that is used more for creating new learning, while the left hemisphere specialises more in applying learnt information. Metaphors initially create a sense of wonderment, trance and distraction, during which time we are more open to learning new patterns. This can be seen in children who quickly go into a daydream when they hear something interesting said, as the right hemisphere is making meaningful sense of it. A skilled storyteller will often leave the ending of the story open for our imagination to draw its own conclusions. They will also make the story analogous to the person’s circumstances e.g. stories of overcoming adversity, of morality and perseverance, or will draw parallels with other parts of the person’s life such as their hobbies and where they have demonstrated their effectiveness. For example, someone who is afraid of making a presentation may be asked to recall how confident felt when playing football in front of a crowd.

Hypnosis is another method by which people can change their patterns. As with the methods above, hypnosis is a trance or focused state of attention, where the individual is guided into a similar state to REM sleep through progressive relaxation. In this state the mind is most open to new patterns and highly suggestible. There are various characteristics of the REM state that can also be observed in hypnosis, including:

a) shutting out sensory information to the extent that people have undergone operations without anaesthetic.

b) amnesia; people don't remember being hypnotised nor their dreams, in effect we dream in order to forget so as to deactivate unresolved anxiety (see Joe Griffins theory in section 1)

c) hallucination; the limbic brain does not differentiate dreaming and imagining from reality which can be used to help change a person’s expectations. This is demonstrated noticeable in stage hypnosis where people are processing waking reality though the limbic brain. There is a risk here in activating psychosis in vulnerable people.

All of these techniques; tapping, abstraction, metaphors, disassociation and hypnosis etc will help change our attitudes, however attitude can be multilayered and so removing one layer may reveal another deeper attitude. This process can make us more aware of what is driving our behaviour, but also explain why psychological change is an ongoing process.

Some of these techniques may seem psychologically deep yet they are all natural phenomena that we engage in day and night as part of the brain’s natural functioning. Creating and changing our patterns and attitudes happens constantly; these techniques
simply help to guide that process. Patterns and attitudes are the foundation to all the other stages of the neurological model including emotions, thinking and behaviour. As they are all interdependent, whenever we change one of these, it will also have an effect on our patterns and attitude formation. It is not even necessary to learn to use the above techniques to manage our patterns, the techniques below for managing our emotional state changing our thinking patterns and visualisation will all result in changing our attitudes (i.e. the emotion we attach to the pattern match).

Following the emotional tagging process within the brain, through the Hypothalamus emotions are released into the body mainly as hormones. Emotions are what tell us we are alive, gives us purpose, motivation and expectation. All our wants, fears, likes, hopes, and intentions are emotions, so it is this that we are addressing when we talk of Emotional Intelligence. If a person decides to improve their relationships or cope better with stress of develop their confidence it is always driven by an emotional state that they chose to act upon.

All emotions are useful in that they are the messenger telling us how we are doing, what needs we may have and the attitudes that we hold. If we choose not to attend to them they will come out in other ways, usually growing in strength until we are unable to control them. An important aspect to EI is learning to notice your emotions early, accurately understanding what the emotion is and what this is telling you. The longer we ignore them, repress and deny them the more likely it is that we will be unable to manage them later on. As explained previously, strong emotions may interfere with our capacity to think clearly, and result in more categorical thinking and behaviour. A key point for developing EI is learning how to manage your optimal emotional state. There are many very effective ways of doing this, many of which will focus on breathing, using imagination of calming events, relaxing all parts of the body and using abstract language to help the mind wander off from the stresses of the present. Common to nearly all relaxation techniques is breathing. The first part is to become aware of your breathing, closing your eyes and sitting comfortably helps reduce other distractions. One of the characteristics of anxiety is tension in the muscles which creates short quick breaths, so breathing deeply immediately helps to relax the muscles. Breathing out for longer than we breathe in helps activate the parasympathetic nervous system which also relaxes the body. Through repetition the brain keeps a memory of the relaxed state which over time will be more quickly reactivated by the relaxation activities. (See ‘anchoring’ described earlier).

It is well acknowledged that prolonged stress or negative use of emotions have a deleterious effect on the body (as will be discussed in section 3) and on our capacity to think clearly. Over a period of time we become so used to living in a state of high arousal this becomes our normality and locks us into a trance like state. This is because when we are aroused our orientation response is continuously being fired off which has the effect of focusing and narrowing our attention which in turn reduces our awareness. Sooner or later reality will ‘wake us up’ from our trance either because we become physically unwell through stress related illness, or we go through a life crisis. Fundamental to doing this is learning to be in touch with our feelings by slowing down, reflecting and being calm in order that we can think more clearly and put things into perspective. In order to recover from this condition we may need to re-evaluate who we are and what we want from life. This requires getting in touch with our feelings to realise our needs and wants. At a deeper level it may also require us to re-evaluate our
attitudes and beliefs which provide our sense of purpose and direction in life. We may realise that many of our attitudes were based on a distorted perception of reality and are no longer helpful to us. This can be a difficult process to work through, often challenging lifelong beliefs about ourselves, others and the world in general. To help us through this problem solving process we must be able to think rationally and clearly which is only facilitated by calming down and managing our emotional state.

Poor emotional management does not need to be prolonged to have a negative effect. If we do not manage our emotions effectively from moment to moment they can create some nasty surprises. This is the case when we experience an emotional hijack (a pattern match within the amygdalae) where our brain interprets a stimuli as a dangerous threat even though there may be none e.g. when freezing during an important presentation, panicking when late for a meeting or losing your temper during a friendly football match. Under such conditions our performance can sink to hopeless incompetence, our IQ drops dramatically and all reasoning and judgment are lost. The opposite may also be true if we learn how to manage our emotional state effectively such as remaining calm in a crisis, maintaining focus despite distractions, motivating ourselves during routine and remaining confident after criticism.

3. Thinking

Psychological intervention has been dominated in the last 20 years by Cognitive Behavioural Therapy (CBT) and a focus on thinking. Previous to this was an emphasis on feeling states during the Humanistic period, before that the Behaviourist movement and before that Psychoanalysis. Each has had its successes and its critics, but typically there has always been an over adherence to one model. In practice, it is a combination of different approaches and models that works best and meets people’s different needs. The fact that today we focus on managing our thinking through CBT has perhaps got more to do with societal attitudes than with what is always most effective for helping the individual. Emotional Intelligence integrates all these different practices: the importance of the unconscious mind as highlighted by Freud, the stimulus response models of the Behaviourists, the power of experiential emotional encounter used by the Humanists, managing our thinking used in CBT and the groundbreaking developments of brain science (brain tomography, scanning and imaging) in the last 15 years. In addition EI also focuses on measurement (psychometrics) and effective outcomes (competencies), which have been dominant in business for the last 20 years. So EI is an eclectic model that encompasses the integration of thinking, feelings and behaviour. It is the ‘thinking’ part I will now be discussing.

The emphasis at this stage is on applying the thinking brain to ‘manage’ our emotional brain, in particular when excessive emotions are interfering with our capacity to think rationally.

Most techniques for improving thinking have focused on changing and interrupting irrational and generalised thinking patterns. Irrational thinking is largely the result of excessive emotions (neurochemicals) generated by the limbic brain interfering with clear thinking. Emotions tend to be categorical e.g. like, want, good, bad etc, which if sufficiently strong prevent us from engaging the thinking brain to make a more fine grained analysis of these emotional messages (in the extreme they can block thinking altogether e.g. an emotional hijack as referred to in section 1) When people are locked
into 'emotional thinking' they may use more absolute language such as 'can't, always, must, have to, never, always etc'. Calming the emotional brain down from excessive arousal to enable clear thinking is an essential ingredient to Emotional Intelligence as was discussed in the previous section on emotions.

Cognitive approaches use a range of techniques to help the person to use their thinking brain (neocortex) to think about, understand and manage their feelings so as to be more rational and objective.

One such method is called reframing, where the coach or therapist may feedback what the person says in a more positive way e.g. 'I can't do anything right' may be reframed as 'there are some things you are finding quite challenging at the moment'. The word 'can't' has been replaced by 'challenging', 'anything' by the words 'some things' and 'at the moment' implies that the situation is temporary. More often than not the client will agree with what is said back to them, and the limbic brain will unconsciously begin to reconfigure new patterns to match this reframe.

Other methods are more direct and get the client to consciously challenge their excessively emotional / categorical thinking through their thinking brain. For example, when the person is problem solving, they are asked to imagine what advice they would give to a friend in a similar situation. This will often reduce the emotional brain's involvement because we are not as personally involved with others as we are with ourselves. (In Transactional Analysis terms we are coming from our Adult than form our Parent or Child ego states) As a result we can often be wonderful at giving sound rational and sensible advice to others but don't apply the same to ourselves.

Another way in which we can challenge our negative interpretation of events is to ask the client to give several alternative explanations. As we don't always know which is correct we may as well chose the one that makes us feel better. Alternatively if we think through the best and worst possible interpretations then we are more likely to make a more realistic appraisal. It is also useful to recall past experiences where we have been in similar situations, and whether we are repeating the same irrational thinking patterns. Once we recognise that in the past our overly negative (or positive) assumptions turned out to be false we may start to think more realistically. Other techniques will ask the client to analyse their thinking patterns such as: What triggered their thinking? How did they feel? What was the outcome of their behaviour? And to learn their patterns so they can recognise them sooner.

Negative thinking (e.g. being unduly critical and judgmental) tends to get worse unless we make a conscious intervention. This is because when we are highly emotional we are less able to use our thinking brain and so rely upon the black and white thinking of the emotional brain responses which tends to generalise and exaggerate reality. Also, in a negative mindset we will recall negative memories from the hippocampus far more readily than positive memories creating a downward cycle. Equally, when we think positively, we start to recall positive memories and activate positive attitudes and expectations. In effect our thinking acts as a stimulus for positive and negative attitudes as described in section 1.

Cognitive techniques not only activate positive attitudes they can also break down negative attitudes. This is particularly useful when we hold deeply ingrained attitudes...
such as 'nobody likes me', 'I am bound to fail' or 'nobody can be trusted'. The trick is not to challenge the person's attitude directly, as this will often result in the person thinking of reasons why they are right and entrenching their attitude further. The answer is just to create an element of doubt in their attitude. Deeply rooted attitudes exist as either/or categories, so once doubt is introduced they cease to be deeply held convictions but are open to question by the more realistic and rational analysis of the thinking brain. Instead of blindly accepting the assumption that 'I am bound to fail' the thinking brain considers alternatives and options, and in so doing the possibility for different behaviours is created. The challenge in changing a core belief pattern is that this is the person's reality and so the person does not consider alternatives e.g. if I have concluded from bitter experience at a young age that 'I can't do math's' then assuming this to be true I would not ever attempt to do math's. Just as I may believe 'I can't fly' so don't even attempt to flap my arms, another person believes equally strongly that they can't do maths.

One technique for creating doubt in a core belief is called the Continuum method. Here the client states their belief e.g. 'I am useless' and is asked to define the opposite end of the scale e.g. 'I am capable'. They are then asked to describe this end of the scale in concrete terms so as to avoid nominalisations / abstractions (described earlier under pattern matches), e.g. what does being capable look like? Describe someone who is capable? What do they have and do? The person then scores themselves on a 1-10 scale for each concrete behaviour, and will usually score higher than zero. This is because with abstract words like 'useless' a person can wallow in being a 'zero' because there is nothing concrete to measure against. Unlike a concrete scale such as 'having friends' it is more difficult to score 'zero' on. The purpose of this exercise is not to score 10, but to avoid scoring zero so creating doubt in the persons mind that they are categorically 'useless'. The limbic brain does not process shades of grey like 'being a little bit useless' so the belief pattern is weakened (as in the emotional tagging may be lessened) and opened up to questioning. This is why when we want to make a big change the difficult and most important part is making the fist small step and the rest will more easily follow.

The Continuum approach may be continued by chunking down from a more global objective such as 'having friends' into decreasingly smaller objectives. Ask the person to rate themselves on this scale from 1-10 e.g. 'I am a 6', then ask the same set of concrete questions for what would a 7 look like etc. List these as separate sub-goals each on a 1-10 scale. For example, one goal may be 'to say good morning to people at work'. The process may be repeated until a specific and achievable set of goals is agreed upon. The important step then is that the individual actually does it because the emotional brain only learns from experience, not from thinking about it. The person does not need to change all the sub goals as each goal will be linked to and undermine the underlying negative attitude of 'I am useless'. This will be replaced by the new attitude of 'I am capable', from which this specific sub goal (saying good morning) was originally conceived. This is why setting goals and changing behaviour is far more effective if the specific behaviour is connected with the underlying core attitude.

4. Body and behaviour

Even though we have focused our discussion on the brain, it is in the body that we experience our emotions. In fact, the brain itself does not have any sensory nodes, as can be witnessed in brain surgery during which the patient often remains conscious.
It is the Hypothalamus within the brain that communicates the emotional messages to the body through hormones and neurochemicals. The body may be seen as the workforce, which responds to commands and instructions of the management (the brain), but as with any workforce, it must be properly attended to or will cease to function effectively. To extend this analogy, if we keep healthy and look after our body, the workforce will be motivated and be productive, but if we neglect our body and ignore our emotional and physical needs, then the workforce will become de-motivated and unproductive.

Stress provides one of the most obvious insights as to the interdependence between the brain and the body. The brain creates anxiety and stress when there is a mismatch or dissonance between our emotional brain and our thinking brain, in effect when we chose not to act upon our feelings. Anxiety releases the hormone cortisol which in the short term helps us to take action but in the long run reduces our immunity and so causes illness. In order to reduce this type of anxiety we can either act upon our feelings, or change our attitude to match our behaviour. In terms of Emotional Intelligence, this is known as 'emotional labour' when we act in a way that is incongruent with the way we want to be e.g. if we pretend to like people, or do a job we do not believe in. A recent study using the 'ie' measure found that prison officers who had low regard for inmates but were required within their job to show them respect were far more likely to suffer job burnout.

At a physiological level there is ever increasing evidence for the links between the brain and the body and how one may be used to affect the other (termed psychoneuroimmunology-PNI). In particular how the heart can communicate with our brain to improve our emotional, cognitive and physical well being. The heart has four different forms of communication directly with the brain, including neurological (the nervous system), biochemical (hormones and neurochemicals produced in the heart), mechanical (pulse) and electromagnetic signals. Their is also evidence for the existence of neurons within both the gut and the heart, with the heart having its own nervous system that can feel, sense and remember independently of the brain, thus suggesting a level of intelligence. Indeed, the heart is formed and starts to beat in the fetus before the brain exists. An institute in America called Hartmath has been researching the important effect of the heart rate beat to beat variation as a significant measure of our physiological condition. The evidence is mounting that, rather than simply following commands from the brain, the body has direct influence over the brain. As with any organisation (the person) the management (the brain) and the workforce (the body) have different roles but are part of the same system and interdependent.

At this point it is worth considering the main neurochemicals that affect the body and drive our behaviour. Candace Pert a pioneer of PNI, in her book 'Molecules of Emotion' describes the neurohormones as 'substrates of emotion' and more specifically as 'long chain peptides that act like strands of DNA providing the communication between the body and brain'. Two of the most significant of these are Dopamine and Serotonin. Dopamine is the chemical of motivation, passion, need and desire, so in a sense provides our lives with purpose and meaning. The reward for meeting our goals is the opiate chemical Serotonin, which provides us with a sense of well being and is created naturally through positive behaviours such as laughter, humour and friendship. The two
chemicals work in tandem, Dopamine creates our drive and Serotonin provides a reward, a kind of push-pull effect.

However, as with any drug, the brain soon becomes accustomed and requires greater stimulus to provide the same reward. This is why as a species we continue to evolve, grow and develop, otherwise, if we felt equally satisfied by repeating the same behaviours we would have no incentive to do or learn anything new. Just as this natural process works for us, if not managed properly it will work against us and lead to addiction. For example, artificial stimulants such as alcohol and drugs will create dependence as the body stops producing the reward chemical naturally.

As the Serotonin reward decreases, the Dopamine craving increases to make us want and try harder to get the elusive ‘fix’. The same process occurs when we become addicted to certain behaviours that make us feel better in the short term even though they do not help us in the long term e.g. being angry and blaming may give us temporary relief from negative feelings we have towards ourselves. The long term Emotionally intelligent approach is to change the deeper negative attitudes towards ourselves, rather than give in to our emotional impulse to defend and protect ourselves. Defensive behaviour is characterised by being rigid and inflexible which prevents us from responding realistically and appropriately to people and our environment.

At a behavioural level we can improve our flexibility by learning how to change our habits. Habits are mostly unconscious, so the first step is to become aware of our actions and start to notice the things we do automatically, then to consider whether we want to keep or to change these behaviours. Some typical negative habits include blaming others, blaming ourselves, demanding constant attention, feeling helpless/victimised, compulsive working, over eating, watching too much television, excess alcohol and so on. One option can be to replace them with positive habits such as taking exercise, showing appreciation, being outdoors and meeting people etc. The difficulty in changing a habit is that the neural pattern must be replaced by a stronger alternative, which means the new behaviour must be rehearsed frequently if it is going to stick and we are to avoid reverting back to the old behaviour. The trick here is to focus on a very narrow piece of behaviour and repeat it daily. Another barrier to change is that we may unconsciously want to hold on to our negative and defensive behaviours because they still provide us with some relief while we use them. The answer here is to make sure that you really want to change and that the pay off for doing so outweighs the sacrifice. Also to make sure that you get support from alternative internal and external resources while you are giving up the negative and defensive behaviours.

5. Outcomes

We now come to the final stage in the process, the Outcome of our behaviour. Each stage is of course the outcome of the previous stage, but the final outcome is the result of our actions. Let us consider an example of the entire process;

- Someone shouts at me (stimulus),
- I perceive this as a threat (pattern match),
- creating a feeling of anger (emotional tag),
- I interpret this as ‘the person does not like me’ (thought),
which I also experience in my body as adrenalin (body),
I shout back at this person (behaviour)
that results in us having an argument and falling out (outcome).
Falling out (new stimulus) creates another pattern match causing me to feel remorse,
I may then choose to apologise and the cycle continues.

This process challenges the original Stimulus Response (S-R) model in two ways.
Firstly we have the capacity to chose our response (by thinking or changing our attitude),
and secondly our response to a large extent creates the next stimulus. Far from being
passive agents waiting for things to happen we can in fact determine what happens in
our environment. This changes the original linear Stimulus Response (S-R) model to be
cyclical; Stimulus-Attitude-Think-Respond-Stimulus (S-AT-R-S etc). The development
point here is that people are empowered; we can determine a lot in our lives and create
our environment and circumstances. One way of achieving this is by having clear
intentions and a compelling vision of what we want to achieve, which I will now discuss.

Being Emotionally Intelligent is being both personally and interpersonally effective. What
is judged as effective depends on whether we have met our objectives. In other words if
we want to be Emotionally intelligent then we need to have an intention as to what we
want to achieve (see ‘ie’ scale Goal directedness). It follows that to develop our
outcomes we should focus on our intentions. In neurological terms this means creating
new patterns and attitudes. that will orientate our body and mind to the outcome we want
to achieve. A powerful way of doing this is through visualisation, guided imagery and
mental rehearsal.

Our imagination is in effect a reality generator; it creates expectations in the brain that
are indistinguishable from actual reality. Through guided imagery (described below) our
imagination is activated; a light stage 1 sleep where we are still aware of what is
happening around us. Imagination engages the limbic brain (which according to Griffin
replicates the REM state, the state we are in when we form our patterns). Once we are
in this state the limbic brain become highly suggestible and receptive to forming new
patterns and associated feeling states (attitudes). Mentally rehearsing what we want to
achieve therefore creates new patterns that at an unconscious level seek a match from
the environment (an expectation). For example, if through guided imagery I have
rehearsed having a confident job interview, the next time I attend a job interview my new
patterns will be matched releasing feelings of confidence, thus fulfilling my unconscious
expectation.

Guiding someone to use their imagination is quite simple but has several subtleties to it.
The first step is to help the person to relax physiologically, cognitively and emotionally.
This may be done by initially focusing them on their breathing, getting them to relax
every part of their body and imagine being in a peaceful place.
Speaking to them in a gradually softening voice using vague and abstract language (see
nominalisations described earlier) also helps by activating their right hemisphere, which
searches for and creates positive meaning.

Once relaxed the person can be guided to imagine whatever outcome they wish to
achieve, such as giving a confident presentation, succeeding in sport, or just feeling
calm and relaxed after a stressful day. The more texture we put on the image such as
sound, colour or smell the stronger and more compelling the image becomes. Our
imagination also has the capacity to create negative expectations if we don’t manage it properly, which can result in exaggerated thinking and irrational fears. Having created an expectation through our imagination we are unconsciously drawn to making this happen, so it is that people, who anticipate success, succeed, and those who expect to fail, fail.

Conclusion

If we return to our definition and description of EI “the practice of using thinking about feeling and feeling about thinking when choosing what to do”, (our capacity to do this is strongly influenced by the pattern of our most fundamental attitudes, particularly our regard for ourselves, and for other people in general) we can see that this is supported from the neurological perspective. Our attitudes are neurologically connected to pattern matches, which release emotional tags (feelings) and influence our thinking. Equally thinking can act as a stimulus for a pattern match and fuel our feelings. How we manage this process is our Emotional Intelligence which may be addressed at each of the stages. Although I have analysed each of the component parts as stages it should be apparent by now that thinking, feeling and behaviour are entirely interconnected, changing one will change all the others.

In terms of developing EI, the neuropsychological perspective provides clarity on how interventions can be made at any of these ‘stages’, including changing the Stimulus to create a different response, changing Patterns and Attitudes to adapt our emotional response, changing Cognition to reduce irrational thinking, changing Behaviour to form new habits, and visualising Outcomes to achieve our goals.

References: