

Towards a Growth Mindset

Based on the work of Dr Carol S. Dweck

Babies and children grow and develop at an extraordinary rate – particularly in their mental abilities. If when we are small we are blessed with caring parents then this facilitates the appropriate development of the neuronal connections in our brains in terms of: learning; affect (emotional) regulation; immediate responses to stress; and abilities to cope with the stressors and strains in life as we grow older (Ainsworth & Bell 1970; Bowlby 1969, 1988; Winnicott 1965; Ogden 2009; Porges 2005; Sunderland 2007).

Whatever our childhood was like, we can continue to develop and flourish in our adult life. We may, however, be hindered in this with the belief that our intelligence¹ is fixed and so we believe, falsely, that we cannot grow and develop. Carol Dweck calls this having a Fixed Mindset. Note that “there is nothing *necessarily* fixed about a fixed mindset; but a fixed mindset is a self-confirming prophecy because if we have a fixed mindset we cannot progress effectively”².

The opposite of this is the Growth Mindset, where we feel that while intelligence may be to some extent dependent upon our genes, our potential depends to a great extent on us having a positive attitude to life and change – and the concept of personal growth. This involves taking responsibility for our actions and recognising the need to develop our skills; in this way, we can change from a Fixed Mindset to a Growth Mindset.

Such a positive attitude, and the learning that comes with it, will switch on some of our genes, and switch others off – all in the direction of growth and development. Our genes are not, in fact, fixed entities: rather, their expression can be modulated by our environment and our positive attitude. This flexible aspect of our genes comes within the domain of epigenetics (Rossi 2002). This means, in practice, that the age old debate of nature (genes) and nurture (environment) is to some extent obsolete: for our environment, feelings, and thoughts affect our genes; and our genes affect our thoughts / feelings / behaviours. This is a two way process.

The concept of a Growth Mindset is intimately connected with gene expression. Ernest Rossi makes a series of remarkable statements in the Preface to his “The Psychobiology of Gene Expression”:

¹ Some decades ago in Britain Intelligence Tests were used in the Eleven Plus examination to determine which children were bright enough to go to a Grammar School; those who were not were sent to the Secondary Modern schools. In fact, this was a misapplication of the original idea of measuring Intelligence; Alfred Binet, the Frenchman who developed them, was concerned that many children in Paris were not reaching their potential: so he devised the test to show that, with a suitable environment, the intelligence of these pupils could be increased (Dweck 2012 pp 4-5).

² Adapted from an email from Michael Ross 29-03-2014 – with thanks.

Three fundamental discoveries of current neuroscience will forever change the way we understand human nature.

- ❖ The first is that novelty, enriching life experience, and physical exercise³ can activate neurogenesis – new growth in the brain⁴ – throughout our entire lifetime.
- ❖ The second is that such experiences can turn on gene expression within minutes throughout the brain and body to guide growth, development, and healing in ways that could only be described as miraculous in the past.....
- ❖ The third discovery follows as a natural implication of the first two. We now really know that "every recall is a reframe." That is, whenever we recall an important memory, nature opens up the possibility for us to reconstruct it on a molecular-genomic level within our brain. That is, we are constantly engaged in a process of creating and reconstructing the structure of our brain and body on all levels, from mind to gene.

Rossi 2002 p XV;
Original format slightly altered; - irfr

New growth in the brain is of course intimately linked with new learning.

A Fixed mindset will tend to limit our potential – and the potential within our genes; whereas a Growth Mindset will help us to reach our potential and flourish. The essence of these two types of mindsets are given in the two diagrams on the next page – Figure 1 & Figure 2: if we feel we are rather gravitating towards the Fixed Mindset⁵, that is no cause for alarm – in that Mental Training such as Positive Mental Training, Meditation, and Autogenic Training will help us to move into the Growth Mindset – the fact that you are reading this is proof of this dynamic change!

³ Neurogenesis has now been shown to be stimulated by both physical and mental exercise [Rossi 2009 p 290]; this is clearly of crucial importance from the perspective of both healing and creativity. Mindfulness and Meditation / Autogenic Training is a form of mental exercise – and seem to facilitate brain dynamics and learning.

⁴ When I was a medical student (in the 1960s) we were taught that new nerve cells could not develop in the adult brain (or old ones regenerate). Recent research suggests that this is not the case; *and* that the brain remains much more "plastic" – and so adaptable – than previously thought. (See, for example, Gould et al 1999a; Gould et al 1999b; Kempermann et al 1997; 1999.)

⁵ My brother Michael Ross comments that if we are tending towards a Fixed Mindset we need to “recalibrate our conception of efficacy: self efficacy leads to (positive) self esteem, not self esteem that leads to self efficacy”.

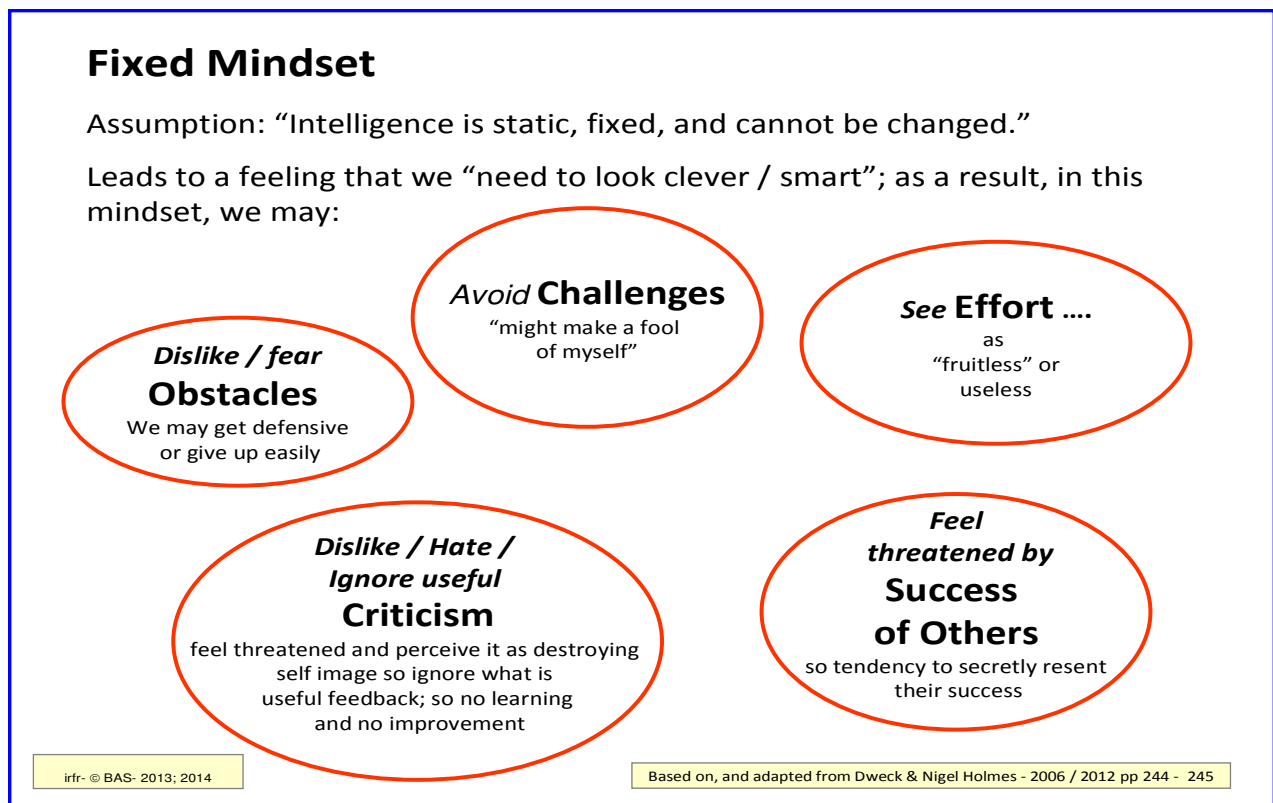


Figure 1: Fixed Mindset – some characteristics

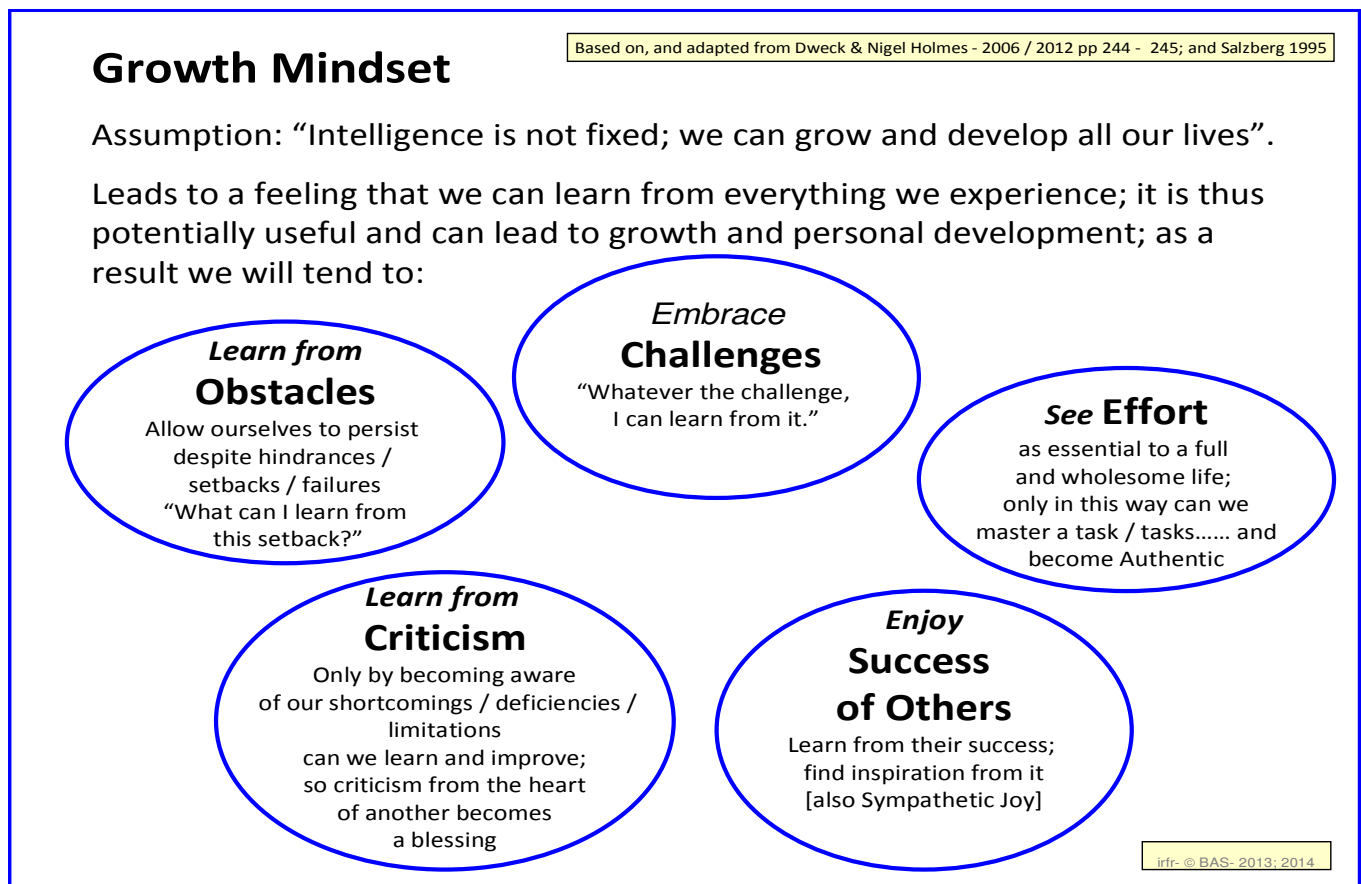


Figure 2: Growth Mindset – some characteristics

Growth Mindset and Primary Process Emotions

We could also describe the Growth Mindset as the Exploratory Mindset⁶. The word “exploratory” is very pertinent as it reminds us that learning and growth are powered and motivated – in part at least – by our SEEKING system: a fundamental Primary Process Emotion, that is central to our Well Being from the day we are born to the day we die: for example, seeking food and safety; seeking companionship; seeking meaning and understanding [Panksepp 1998; Panksepp & Biven 2012; Sunderland 2007].

A Fixed Mindset can at times be associated with some forms of stress and performance anxiety (and associated FEAR circuits [Panksepp 1998]); which will axiomatically be associated with increased SNS afferents from the body and the viscera [Craig 2005; and C12 in this series]; this will be associated with a reduction in our ability to have positive Social Engagement with others [Porges 2012].

On the other hand, a Growth (Exploratory) Mindset will often be associated with PLAY and sometimes nurturing / CARE – e.g. in childhood; these will both be associated with increased myelinated vagal activity [Porges 2012; 2005; and see A7 & A8 in this series] and so with (positive) Social Engagement – in which our ability to learn is significantly enhanced.

In fact, if we approach our learning in a playful yet mindful [D1 in this series] way, we will be simultaneously in a positive mental frame of mind and activating appropriate neuro-physiological circuits for learning; children of course are learning much of the time through PLAY [Panksepp & Biven 2012; Axline 1964].

In summary⁷:

1. Intelligence is not fixed.
2. If our tendency is towards a Fixed Mindset, we can choose to change to a Growth Mindset.
3. Brain connections can grow throughout our entire life – they are like muscles in that they grow with use; and shrivel with lack of use.
4. As we learn, the neuronal connections in the brain grow and get stronger.
5. Positive learning⁸ is generally facilitated by a safe / nurturing environment rather than a threatening environment [Axline 1964; Airaksinen 2006]. When we are anxious, we may no longer be able to think logically.
6. Short term memory does not automatically become long-term understanding and knowledge.
 - Connections in the brain depend upon on-going repetition and practice to become established. It is this repetition and practice that allows long-term memory – and deep understanding – to develop. Physical Exercise facilitates in establishing these neuro-memory connections (Cotman 2007).
7. Success depends far more on *effort* and *practice* than on *inborn-talent*.

8/

⁶ Thanks to Alastair Dobbin for this formulation – following a coastal walk discussing the concept of Well Being in the context of Affective Neuroscience – 7th March 2014].

⁷ Adapted from MJR’s summary – with thanks

⁸ Here we are referring to cognitive type learning and understanding – not fear-induced learning of a Pavlovian type.

8. We all have far greater potential than was previously thought possible.
9. Our attitudes to Mistakes and Errors:
 - Fixed Mindset: embarrassment, shame, giving up, feeling useless.
 - Growth Mindset: “Let’s see where we went wrong – and learn from it.” [As Professor G.J. Romanes used to say to his anatomy medical students in the 1960s: “The only stupid question is the one you don’t ask”!]
10. Our attitude to Challenges:
 - Fixed Mindset: “I can’t risk failing so I won’t try” [“Failure will make me *look* stupid.”]
 - Growth Mindset: “Life is full of challenges; I can only improve by embracing them.” [“If I *look* stupid, that is not what matters: what matters is that I learn from this.”]
11. Beware of praise [Hanh 1993 pp 73-74]. “Learners benefit from the realisation that they have improved their own performance. Shifting to an internal locus of control (believing they are responsible for their own learning) is one of the most powerful changes that can occur” [Ross, M. 2008 p 13; also see Lefcourt 1982].
 - My brother Michael Ross comments that if we are tending towards a Fixed Mindset we need to “recalibrate our conception of efficacy: increased self efficacy leads to (positive) self esteem – we can perform our tasks more successfully; but having self esteem artificially boosted by praise without increased self-efficacy will lead to empty pride before an inevitable fall”.
12. By remaining mindful, we can monitor our progress – for example, by noticing the small incremental steps that we are making in our learning / understanding – enjoy the feeling when you see when and how you improve.

References and sources

Ainsworth, M. D. S., & Bell, S. M. 1970. Attachment, exploration, and separation: <i>Illustrated by the behavior of one-year-olds in a strange situation</i> . Child Development, 41, 49-67	
Airaksinen, Eija: 2006: Cognitive Functions in Depression and Anxiety Disorders; thesis - Karolinska Institute, Stockholm ISBN 91-7140-954-8	
Axline, Virginia M. 1964. Dibs: <i>In Search of Self</i> [Personality Development in Play Therapy]	ISBN 0-14-021344-9
Bowlby, John: 1969. Attachment and Loss: <i>Volume 1: Attachment</i> . Pelican	ISBN 0-14-022606-0
Bowlby, John: 1988. A Secure Base: Clinical Applications of Attachment Theory. Routledge	ISBN 0-415-00640-6
Cotman, C. W.; Berchtold, N.C.; and Lori-Ann Christie. 2007. Exercise builds brain health: <i>key roles of growth factor cascades and inflammation</i> . Trends in Neurosciences: Vol. 30; 9: 464-472	
Dweck, Carol S. 2012. Mindset: <i>How you can fulfil your potential</i>	ISBN 978-1-78033-200-0
Fredrickson, Barbara: 2009. Positivity	ISBN 978-0-307-39373-9
Gould, E.; Tanapat, P.; Reeves, A & Shors, T.: 1999a; Learning enhances adult neurogenesis in the hippocampal formation.	Nature Neuroscience, 2 (3), 260 – 265
Gould, E.; Alison, J.; Reeves, A.; Michael, S.; Graziano, S. & Gross, C.: 1999b; Neurogenesis in the neocortex of adult primates.	Science, 286; 548 – 552
Hanh ;Thich Nhat: 1993; Transformation and Healing – <i>On the four establishments of mindfulness</i> ;	Rider; ISBN 0-7126-5732-0
Kempermann, G.; Kuhn, G.; & Gage, F: 1997: More hippocampal neurones in adult mice living in enriched environment.	Nature, 386; 493 – 495
Kempermann, G. & Gage, F.: 1999; New nerve cells for the adult brain.	Scientific American, 280, 48 – 53
Lefcourt; Herbert M: 1982. Locus of Control: Current Trends in Theory and Research;	London ISBN; 0-89859-222-4
Ogden, Pat. 2009. Emotion, Mindfulness, and Movement: <i>Expanding the Regulatory Boundaries of the Widow of Affect tolerance</i> .	
IN: The Healing Power of Emotion – Eds: Diana Fosha, Daniel J. Siegel, & Marion Solomon pp 204-231	ISBN 978-0-393-70548-5
Panksepp /	

References and sources continued

Panksepp, Jaak: 1998. <i>Affective Neuroscience: The Foundation of Human and Animal Emotions</i> ;	ISBN 0-19-509673-8
Panksepp, Jaak; & Biven, Lucy. 2012. <i>The Archaeology of Mind: Neuro-evolutionary Origins of Human Emotions</i>	ISBN 13-978-0-393-70531-7
Porges, Stephen W. 2005. <i>The Role of Social Engagement in Attachment and Bonding – a Phylogenetic Perspective</i> pp 33-54. IN: <i>Attachment and Bonding – A New Synthesis</i> . Eds: C.S. Carter; L. Ahnert; K.E. Grossmann; S.B. Hrdy; M.E. Lamb; S.W. Porges; & N.Sachser	ISBN 0-262-03348-8
Porges, Stephen W. 2011. <i>The Polyvagal Theory – Neuro-physiological foundations of Emotions, Attachment, Communication, Self-Regulation</i> .	ISBN 978-0-393-70700-7
Ross, Michael J. 2008 <i>The Multiplier Effect in Teaching – how to increase the impact of day to day teaching</i>	ISBN 9 780955 948602
Rossi, Ernest L.; 2002; <i>The Psychobiology of Gene Expression</i> ; W.W. Norton	ISBN 0-393-70343-6
Rossi, Ernest L.; 2009. <i>The Psychosocial Genomics of Therapeutic Hypnosis, Psychotherapy, and Rehabilitation</i> . <i>American Journal of Clinical Hypnosis</i> ; 51: 3; January 2009; pp 281-298	
Salzberg, Sharon. 1995. <i>Loving Kindness</i> . Chapter 8: <i>Liberating the mind through Sympathetic Joy</i> – pp 119-135	ISBN 978-1-57062-903-7
Sunderland, Margot. 2006 / 2007 <i>What every parent needs to know</i>	ISBN 978-1-4053-2036-8
Winnicott DW. 1965. <i>The Maturation Process and the Facilitating Environment</i> .	Karnac books ISBN 0 946 439 84 2

[Linked themes in this Autogenic Dynamics section](#)

A3	Toward a concept of happiness and well being
A7	Porges and the Polyvagal Theory – reflections on clinical and therapeutic significance
A8	The Polyvagal Theory and a more sympathetic awareness of the ANS
B2	Reframing, Reappraisal, and Well Being
B3	Part I: The Origins of Affect and Affective Neuroscience – and the misplacing of Affect in the Neo-cortex
B3	Part II: Emotional Operating Neuro Circuits – a brief introduction to the work of Panksepp
B5	Emotions, Frontal Lobe Dynamics, and Meditation
B6	Perceptions, flowers, and reality
B7	The Effects of Positive Imagination on Anxiety and Affect
B8	Empathy, Mirror Neurones, and Prefrontal cortex
B9	Mental Training, the Pre-frontal cortex, Resilience and Equanimity
B19	Reflections on a Secure Base – Bowlby, Ainsworth, Attachment and Well-Being⁹
C3	Resonance Circuits, Mirror Neurones, and Mindfulness
C12	Presence in Mind: Autonomic Afferents and Well Being
D1	Reflections on Foundations for Mindful Living

Thanks to Michael Ross for introducing me to the concept of Growth Mindset, and for his helpful advice on various drafts of this document; to Alastair E. Dobbin for his comments; and to Annie Sturgeon for her helpful comments and proof reading.

⁹ Planned for Autumn 2014