NeuroSPARK™ Brain Fitness for the Knowledge Economy

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"Our capacity to achieve goals, work effectively with others and manage emotions will be essential to meet the challenges of the 21st century".

<table>
<thead>
<tr>
<th><strong>Industrial Economy</strong></th>
<th><strong>Knowledge Economy</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td>Being the boss</td>
<td>Building relationships</td>
</tr>
<tr>
<td>Technical Knowledge</td>
<td>Emotional Intelligence</td>
</tr>
<tr>
<td>Perfection</td>
<td>Failing successfully</td>
</tr>
<tr>
<td>Adherence</td>
<td>Engagement</td>
</tr>
<tr>
<td>Tactical thinking</td>
<td>Thinking strategically</td>
</tr>
<tr>
<td>Appraisals</td>
<td>Performance management</td>
</tr>
<tr>
<td>Manage quality</td>
<td>Manage time</td>
</tr>
<tr>
<td>Process</td>
<td>Results</td>
</tr>
</tbody>
</table>
Workplace 1950s –2000s

Thanks to Dr Kim MacKenzie QUT Business School
How We Make Decisions

What some people think:

Men: Emotions | Logic

Women: Emotions | Logic

What’s really true:

Men: Emotions | Logic

Women: Emotions | Logic
The Three Parts of the Brain

- Thinking
- Emotional
- Survival
How the Emotional Brain Wires Itself in an Unhelpful Way
Every Brain is Born Slightly Different
Genetics and Environment and Experience
Impact of Adverse Childhood Experiences (ACEs)

Stressors Measured:
- Emotional, physical and sexual abuse
- Neglect
- Having a mentally ill or addicted parent
- Losing a parent to death or divorce
- Living in a house with domestic violence
- Having an incarcerated parent

Kaiser Permanente; Study of 17K Californians
While you were growing up, during your first 18 years of life:

1. Did a parent or other adult in the household often or very often
   Swear at you, insult you, put you down, or humiliate you?  
   or 
   Act in a way that made you afraid that you might be physically hurt?  If yes enter 1 _______

2. Did a parent or other adult in the household often or very often
   Push, grab, slap, or throw something at you?  
   or 
   Ever hit you so hard that you had marks or were injured?  If yes enter 1 _______

3. Did you often or very often feel that
   No one in your family loved you or thought you were important or special?  
   Or  Your family didn’t look out for each other, feel close to each other, or support each other?  If yes enter 1 ____
Healthy Brain

This PET scan of the brain of a normal child shows regions of high (red) and low (blue and black) activity. At birth, only primitive structures such as the brain stem (center) are fully functional; in regions like the temporal lobes (top), early childhood experiences wire the circuits.

An Abused Brain

This PET scan of the brain of a Romanian Orphan, who was institutionalized shortly after birth, shows the effect of extreme deprivation in infancy. The temporal lobes (top), which regulate emotions and receive input from the senses, are nearly quiescent. Such children suffer emotional and cognitive problems.
ACE Score & Risk for Chronic Disease

Disease risk increases with ACE scores, Felitti et al, 1998
Impaired Worker Performance

ACE Score and Indicators of Impaired Worker Performance

- Absenteeism (>2 days/month)
- Serious Financial Problems
- Serious Problems Performing job

Prevalence of Impaired Performance (%)
ACE Score & Rates of Anti-Depressants
(50 years later)

Prescription Rate per 100 Person Years

ACE Score

Mental Health Costs
Stress activates the amygdala.
Amygdala under Stress Sends Cortisol and shuts down the CEO of the Brain

Joseph LeDoux and his associates have demonstrated that the brain is wired to learn to associate fear with a visual image, sound, smell, tactile sensation without mediation by the cerebral cortex (i.e., without thought). A person can experience a fear reaction before they are consciously aware of the stimulus.
NeuroSPARK Brain Fitness
It starts with understanding the brain and how to apply practical tools to drive a new brain pathway

Being the Best I Can Be
- Clear thinking, empathy, motivated, focused, creative
- Feeling good, kind & caring, self esteem, happy
- Everything is bad, blaming others, defensive
- Angry, aggressive, attacking others, survival mode

Animal
Positive
Negative
NeuroSPARK Brain Fitness Training to Reconnect the Brain to Think, Feel and Perform Better

Stage 3: Apply neuroplasticity principles to achieve potential
Working Memory Test
What’s Happening Inside the Brain

[Diagram showing the flow from sensory input to emotional brain (AMYGDALA) to thinking brain (PREFRONTAL CORTEX) and the RATIONAL RESPONSE, with a Fight, Flight or Freeze response.]
Driving New Pathways/Habits in the Brain Takes Time and Hard Work

Neuron BFF
Best Friends Forever

FOR NOW
Fitness for the Thinking Brain

• Evidence-based brain training programs that target the thinking brain:
  • Improves memory, cognition, and attention
  • Works to refocus and reframe the brain
  • Provides cognitive reserve—more synapses as we are losing them
Evidence-Based Neuroplasticity Programs for Whole Brain Fitness
NeuroSPARK for Social Impact: Vital Communities

Child Protection, Corrective Services and Disability Services

Qld government community services

Rubicon Programs: social/emotional and cognitive brain fitness training
Hardwired to Feel Good Doing Good

Boyle et al., 2012 JAMA Psychiatry
Start with Ourselves First

Adam I and Adam II
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Whole Brain Fitness for Vital Living