HARDWIRING HAPPINESS

THE BRAIN TAKES ITS SHAPE FROM WHAT THE MIND RESTS UPON, SAYS RICK HANSON

The brain is the organ that learns, so it's designed to be changed by your experiences. It still amazes me but it's true: whatever we repeatedly sense and feel and want and think is slowly but surely sculpting neural structure. As you read this, in the five cups of tofu-like tissue inside your head, nested amid a trillion support cells, 80 to 100 billion neurons are signalling each other in a network with about half a quadrillion connections, called synapses. All this fast, complex and dynamic neural activity is continually changing your brain. Active synapses become more sensitive, new synapses start growing within minutes, busy regions get more blood as they need more oxygen and glucose to do their work, and genes inside neurons turn on or off. Meanwhile, less active connections wither away in a process sometimes called neural Darwinism: the survival of the busiest.

All mental activity is based on underlying neural activity. Much mental and therefore neural activity flows through the brain like ripples on a river, with no lasting effects on its channel. But intense, prolonged, or repeated mental/neural activity – especially if it's conscious – will leave an enduring imprint in neural structure, like a surging current reshaping a riverbed. As they say in neuroscience: neurons that fire together, wire together. Mental states become neural traits. Day after day, your mind is building your brain.

This is what scientists call experience-dependent neuroplasticity, which is a hot area of research these days. For example, London taxi drivers memorising the city's spaghetti snarl of streets have thickened neural layers in their hippocampus, the region that helps make visual-spatial memories; as if they were building a muscle, these drivers worked a part of their brain and grew new tissue there. Moving from the cab to the cushion, mindfulness meditators have increased grey matter – which means a thicker cortex – in three key regions: prefrontal areas behind the forehead

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that control attention; the insula, which we use for tuning into ourselves and others; and the hippocampus.

If you step back from the details of these studies, one simple truth stands out: your experiences matter. Not just for how they feel in the moment but for the lasting traces they leave in your brain. Your experiences of happiness, worry, love and anxiety can make real changes in your neural networks. The structure-building processes of the nervous system are turbocharged by conscious experience, and especially by what's in the foreground of your awareness. Your attention is like a combination spotlight and vacuum cleaner: it highlights what it lands on and then sucks it into your brain – for better or worse.

There's a traditional saying that the mind takes its shape from what it rests upon. Based on what we've learned about experience-dependent neuroplasticity, a modern version would be to say that the brain takes its shape from what the mind rests upon. If you keep resting your mind on self-criticism, worries, grumbling about others, hurts and stress, then your brain will be shaped into greater reactivity,

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