

# The Science of Gratitude

Gratitude is a complex emotion, but we can capture its essence, says Jason Liem

As we do most nights, my family and I sat around the dinner table the other night, catching up on the day's events and connecting. It was a typical weekday evening and nothing out of the ordinary.

There was a natural pause in the conversation as I took a bite to eat. Then, subtly, the realisation dawned on me that the number of these dinners was finite. My kids were already teenagers, and it would only be a few more short years before they flew the nest. That's when the sense of gratitude settled over me, knowing that, although finite, I still had many more gatherings with my family around the table.

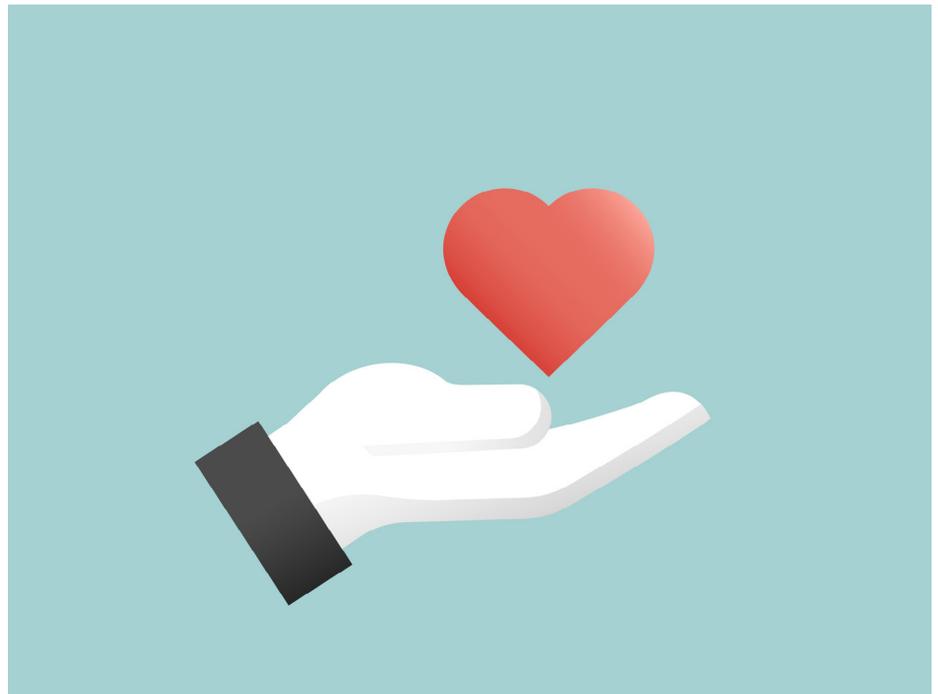
Gratitude is a complex emotion, but we can capture its essence by stating two words – thank you. It is an appreciation for what we have. To feel a sense of gratitude requires us to bring our attention to the here and now.

When we are present with our thoughts and emotions, we can acknowledge and appreciate the things, the people, and the opportunities in our lives.

## Memories

Take a moment to recall a memory. Perhaps something you did last weekend or your most recent vacation. Maybe a movie that completely engrossed you or a growling dog that scared you. What do all these memories have in common? First, our brains tend to store memories that have emotional significance, whether something deemed positive or negative happened to us.

If I asked you what you had for lunch last Tuesday, you would probably find it hard to recall what you ate unless it was emotionally salient. But, on the other hand, if I asked you to tell me about your last vacation before the pandemic, I'm pretty confident you'd be able to remember it in quite a bit of detail.



Life is defined, in part, by the significant events in our lives and by all the countless small events. We more easily remember the big events because of their significance. However, unless we are cognizant of them, smaller events tend to fade into the mists of the past. But by applying the conscious use of gratitude, we can make those small events emotionally salient, increasing the likelihood of our brains storing them as a memory.

## Negativity Bias

Evolution has hard-wired our brain with critical survival programming. A part of this programming is the tendency for our brains to note the negative before the positive, dubbed the negativity bias.

This bias is evolutionarily coded into us to be attentive to dangers, hazards and threats. The coding is a definite benefit when it comes to the long-term survival of our species. However, when our brains interpret perceived threats as real threats, it becomes disadvantageous.

Many of us feel stressed and pressed by the demands and the velocity of our lives. It then becomes easier for us to fall into a reactive mindset where the negativity bias becomes the dominant filter through which we see the world.

Conscious gratitude is a countermeasure to the negativity bias. We consciously choose to change the filter to where we invest our attention. Gratitude means we actively choose to focus on the good things in our lives and what is happening to us. It helps us take account of the things that we appreciate.

## The Science of Gratitude

Scientists conducted a [study](#) in 2008 to measure the brain activity of people thinking and feeling gratitude.

They found that "gratitude causes synchronised activation in multiple brain regions and lights up parts of the brain's reward pathways and the hypothalamus. In short, gratitude can boost



neurotransmitter serotonin and activate the brain stem to produce dopamine.”

Dopamine is our brain’s pleasure chemical. This neurotransmitter plays a critical role in how we think and plan. It is the motivational fuels that help us focus, strive, and find interest in things.

We feel healthier and happier when we actively dedicate our attention and thoughts to the people, things, and opportunities we are grateful for.

Thanks to the brain’s plasticity, investing in gratitude can become a default habit. One effective way of paying gratitude is to adopt a learner’s mindset. In my article “[Learning: Embracing the Struggle](#),” I wrote extensively on this topic. Every situation becomes a learning opportunity, whether we succeeded or messed up.

When we take the time to learn from an event, we tag that event with emotional significance. Learning is associated with positive feelings, such as growth, development, and confidence.

When we think optimistic thoughts, we can expect to improve every area of our life, including our relationships, health, and performance at work or school.

## The Power of Thoughts

Every thought we have, whether we are aware or unaware of that thought, releases a recipe of chemicals in hormones, neuromodulators, and neurotransmitters.

For instance, when we feel joy, optimism, contribution, meaning, or any other uplifting emotion, cortisol decreases, and the brain produces serotonin, creating a feeling of well-being. When serotonin is streaming through us, we feel happy, calmer, less anxious, more focused, and more emotionally stable.

In his book *Focus: The Hidden Driver of Excellence*, Daniel Goleman talks about how the brain has heightened prefrontal activity. This increased activity, in turn, results in enhanced mental functions such as creative thinking, cognitive flexibility, and even faster processing. In addition, positive emotions widen our attention span, and it also changes our perception and focuses on more of the “we” instead of the “me.”

When we consciously direct our attention to focus on what we appreciate in our day to day lives, we also direct our prefrontal cortex (PFC). The PFC is the home of our higher thinking, such as judgement, decision-making, impulse control, attention span, and reflection.

The PFC decides the amount of attention to pay something based on its importance and how we feel about it. The more we focus on negativity, the more synapses and neurons our brain will create – supporting our negative thought process. Pessimistic thoughts slow down the brain’s function, which impedes our ability to think and process information.

Gratitude focuses our attention on novel things, and novelty stimulates the generation of new synapses.

Gratitude helps to rebalance both sides of our PFC. Let me take a moment to clarify.

Evolution has wired the right PFC (rPFC) to elicit emotions and behaviours associated with disengagement, like caution, withdrawal, reflection, and creativity. When we feel under pressure or are under some perceived threat, the rPFC tends to become over-activated.

The act of gratitude, focused attention on all the good in our lives, reactivates the left PFC (lPFC), which generates emotions and behaviour connected with engagement, such as striving, goal-oriented behavior, motivation, and anger.

This rebalancing of the two sides of our PFC shifts us from an imbalanced and anxious state to a more balanced and reflective one.

### The negativity bias

- Slows down brain coordination
- Makes it difficult to process thoughts or find solutions
- Hinders creativity and finding solutions
- Impacts mood, memory, and impulse control

### Active gratitude

- Increases mental performance by improving cognition
- Intensifies ability to focus and attend
- Enhances ability to think and analyse incoming data
- Enhances ability to solve problems quicker and think creatively

## Practicing Gratitude

Actively engaging in the practice of gratitude forces us into the present. At this very moment, I am appreciative that I can communicate my ideas to you, watch the new leaves on a giant birch tree swaying in the wind outside my window, and take a few moments to check in with myself.

None of these things may be super significant, and that’s not the point. Focusing my thoughts and emotions on the things I appreciate counters the negativity bias, which in turn activates my brain hemispheres equally, leaving me reflective and feeling a sense of well-being.

In the end, gratitude is available to us at any moment; it only requires you to choose where to place your finite and invaluable attention.



**Jason W Birkevold Liem** helps people to think about their thinking so they are better at managing themselves, others and situations. He achieves this through an informative and engaging process that educates people about the brain, cognitive psychology and interpersonal communication. As a result, clients are better able to face their professional and private challenges with more confidence, certainty and clarity. Through his company, MINDtalk, he designs and delivers brain-based leadership and personal

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