The Neuroscience of Gratitude & Its Effects on the Brain

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Key Insights

⏰ 12 minute read

- The neuroscience of gratitude shows it activates brain regions associated with reward, enhancing feelings of contentment & emotional wellbeing.
- Regular practice of gratitude can lead to long-term positive changes in the brain, supporting mental health & resilience.
- Simple exercises like keeping a gratitude journal can improve mood, increase empathy & strengthen social bonds.

Gratitude is a powerful human emotion.

As researchers explore the neurological underpinnings of gratitude, they're discovering that this simple practice can lead to profound positive changes in mood, resilience, and overall wellbeing (Russell & Fosha, 2008).

Gratitude, derived from the Latin word *gratia*, means gratefulness or thankfulness.

Thanking others, thanking ourselves, Mother Nature, or a divine power — gratitude in any form can enlighten the mind and make us feel happier. It has a healing effect on us (Russell & Fosha, 2008).

The benefits of gratitude are endless, and in this article, we explore the neuroscience of gratitude, discuss its scientific basis, and demonstrate how we can use gratitude to improve wellbeing.

Before you continue, we thought you might like to download our five positive psychology tools for free. These detailed, science-based exercises will help you or your clients connect to more positive emotions and enjoy the benefits of gratitude.

What Is Gratitude? A Neuroscientific Perspective

In positive psychology, gratitude is how we acknowledge the good things in life. It can be defined as a positive emotional response that we perceive while giving or receiving a benefit from someone (Emmons & McCullough, 2004).

Gratitude is more than just a positive feeling. It is a complex cognitive and emotional phenomenon that involves recognizing how other individuals contribute to our wellbeing and enhance our appreciation of positive outcomes in life.

From a neuroscientific perspective, gratitude activates key regions of the brain such as the prefrontal cortex, the anterior cingulate cortex, the ventral striatum (a key brain region involved in processing rewards), and the insula (a region of the brain involved in emotional awareness; Fox et al., 2015).

Understanding the neuroscience of gratitude and how these areas of the brain regulate emotion, decision-making, and reward processing is an ongoing process. The neuroscience of gratitude is showing that it can impact relationships, resilience, and mental and physical health (Fox et al., 2015).

Essentially, when we experience gratitude, it changes physiological aspects of the brain that reside at the neurotransmitter level (Fox et al., 2015). These changes create feelings of happiness and contentment.

Researchers also hypothesize that gratitude is correlated with brain activity associated with moral cognition. When people are grateful, it activates reward circuits associated with social interaction and social cognitive processes (Fox et al., 2015).

Changes in the posteromedial and insular cortices, medial prefrontal cortex, and nucleus accumbens (a brain region central to the reward system) occur with these moral and social aspects of gratitude (Fox et al., 2015).

The Science of Gratitude: How It Changes the Brain

Science has shown that aspects of gratitude have specific effects on the brain. For example, one study found that making moral decisions about gratitude activated the right anterior superior temporal cortex (Zahn et al., 2008).

This part of the brain is responsible for emotion, autonomic function, memory, and reward-related functions.

Nervous system and emotional states

At a neurobiological level, gratitude regulates the sympathetic nervous system that activates our anxiety responses, and at the psychological level, it conditions the brain to filter the negative ruminations and focus on positive thoughts (Wong et al., 2018).

The limbic system is the part of the brain that is responsible for all emotional

experiences. It consists of the thalamus, hypothalamus, amygdala, hippocampus, and cingulate gyrus. Studies have shown that the hippocampus and amygdala, the two main sites regulating emotions, memory, and bodily functioning, get activated with feelings of gratitude (Wong et al., 2018).

This part of the brain includes reward pathways and the hypothalamus, which can boost serotonin and activate the brain stem to produce dopamine, improving mood and making us feel good (Zahn et al., 2008).

Changes in the brain

Research examining specific areas of the brain found that individuals who experience higher levels of gratitude had increased gray matter volume (Zahn et al., 2014). Gray matter is where the brain processes sensation, voluntary movement, perception, speech, learning, and cognitive tasks.

Gratitude can change neural structures in the brain, making individuals feel happier and more content. Feeling grateful and appreciative triggers the "good" hormones and regulates effective functioning of the immune system (Zahn et al., 2008).

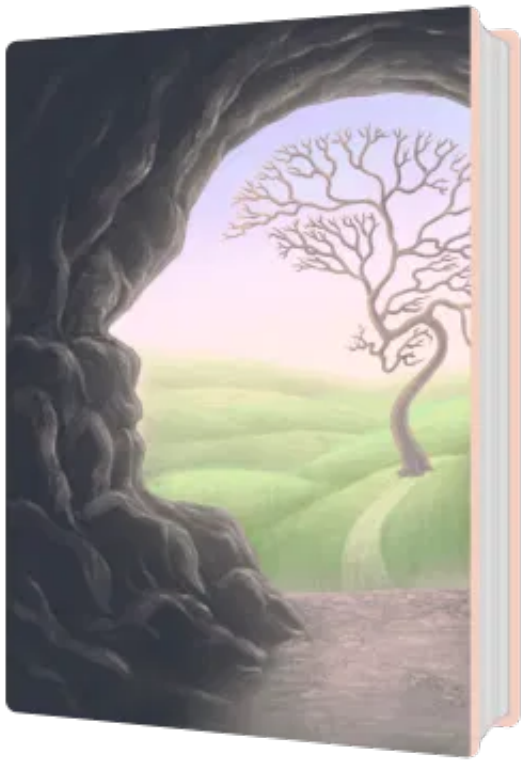
It is hypothesized that gratitude activates the reward center of the brain and can alter the way we see the world and ourselves (Fox et al. 2015).

Gratitude, the brain, and social connection

The correlation between oxytocin function and expressions of gratitude demonstrates the importance of gratitude in social bonding (Algoe & Way, 2014).

Brain activity and hormones are released when individuals report being

grateful for wellbeing and when they hear stories about compassion for emotional pain (Algoe & Way, 2014).



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Psychological & Physiological Benefits of Gratitude

We all know the feeling of gratitude. The warm fuzzy feeling of being appreciated or expressing that appreciation to someone else.

As researchers explore various aspects of neurology and human behavior,

they are finding strong connections between the mind, emotions, and actions.

The neuroscience of gratitude and its relationship with brain function demonstrate numerous psychological and physiological benefits.

Gratitude and resilience

Gratitude has been correlated with resilience and feelings of happiness. One study indicated that participants who felt more grateful and practiced gratitude journaling were also happier and emotionally stronger (McCanlies et al., 2018).

Gratitude can boost emotional resilience by focusing on positive things in life instead of toxic emotions like envy, jealousy, resentment, and anxiety.

This gratitude TED talk by Christina Costa provides a wonderful example of how gratitude can lead to resilience.

Kiss your brain: The science of gratitude - Christina Costa

Gratitude for stress

Committing to a daily gratitude practice may reduce negative emotions and provide a natural stress detox for the mind and body.

Studies on gratitude and appreciation found that participants experienced a reduction in cortisol levels (the stress hormone) and had better cardiac function (McCraty & Childre, 2004).

Participants that practiced gratitude were also more resilient to emotional setbacks and negative experiences (McCraty & Childre, 2004).

Practicing gratitude can help individuals handle stress better and rewire the brain to cope with difficult circumstances with more awareness and broader perception (McCraty & Childre, 2004).

Additionally, studies indicate that people who are grateful to God are healthier and have higher levels of stress resilience (Krause, 2006).

An experiment conducted on three groups of individuals, each team representing a particular age group, revealed that older adults who felt more grateful to God for their lives scored higher on a stress-tolerance index than others (Krause, 2006).

Gratitude and anxiety

There is evidence supporting a relationship between gratitude and anxiety (Lau & Cheng, 2011). In one study 83 Chinese adults were divided into three groups: one wrote gratitude notes and words of positivity, one wrote about their worries, and the third group was assigned a neutral task.

After the task completion, the groups were exposed to stimuli arousing death anxiety, an inevitable fear many individuals struggle with.

Participants in the first group who wrote gratitude notes showed fewer symptoms of death anxiety than the other two groups. A grateful attitude can help individuals attain acceptance and become less fearful of the future (Lau & Cheng, 2011).

This data implies that gratitude and gratitude journaling can reduce anxiety. Gratitude practices like journaling and group discussions are important parts of mental health interventions and life coaching regimes.

Gratitude reduces pain

Gratitude may reduce feelings of pain by regulating dopamine levels (Emmons & McCullough, 2003).

A study known as “Counting Blessings Versus Burdens” found a positive effect on physical wellbeing among participants with neuromuscular diseases (Emmons & McCullough, 2003).

Gratitude has the ability to improve affect in the present and also increases the likelihood that people will function optimally and feel good in the future (Emmons & McCullough, 2003).

Gratitude improves immunity

Gratitude research has demonstrated that individuals who have higher levels of trait gratitude have fewer common health complaints such as headaches, digestion problems, infections, dizziness, congestion, and sleep problems (Hazlett et al., 2021).

Practicing gratitude has also been shown to decrease physical symptoms such as head pain, sore muscles, and nausea. The authors believe that gratitude can downregulate threat responses from the amygdala, decreasing cellular inflammatory responses linked to health (Hazlett et al., 2021).

Gratitude improves sleep

Studies have shown that receiving and displaying simple acts of kindness and expressing gratitude activate the hypothalamus (Zahn et al., 2009). The hypothalamus regulates bodily mechanisms that control sleep.

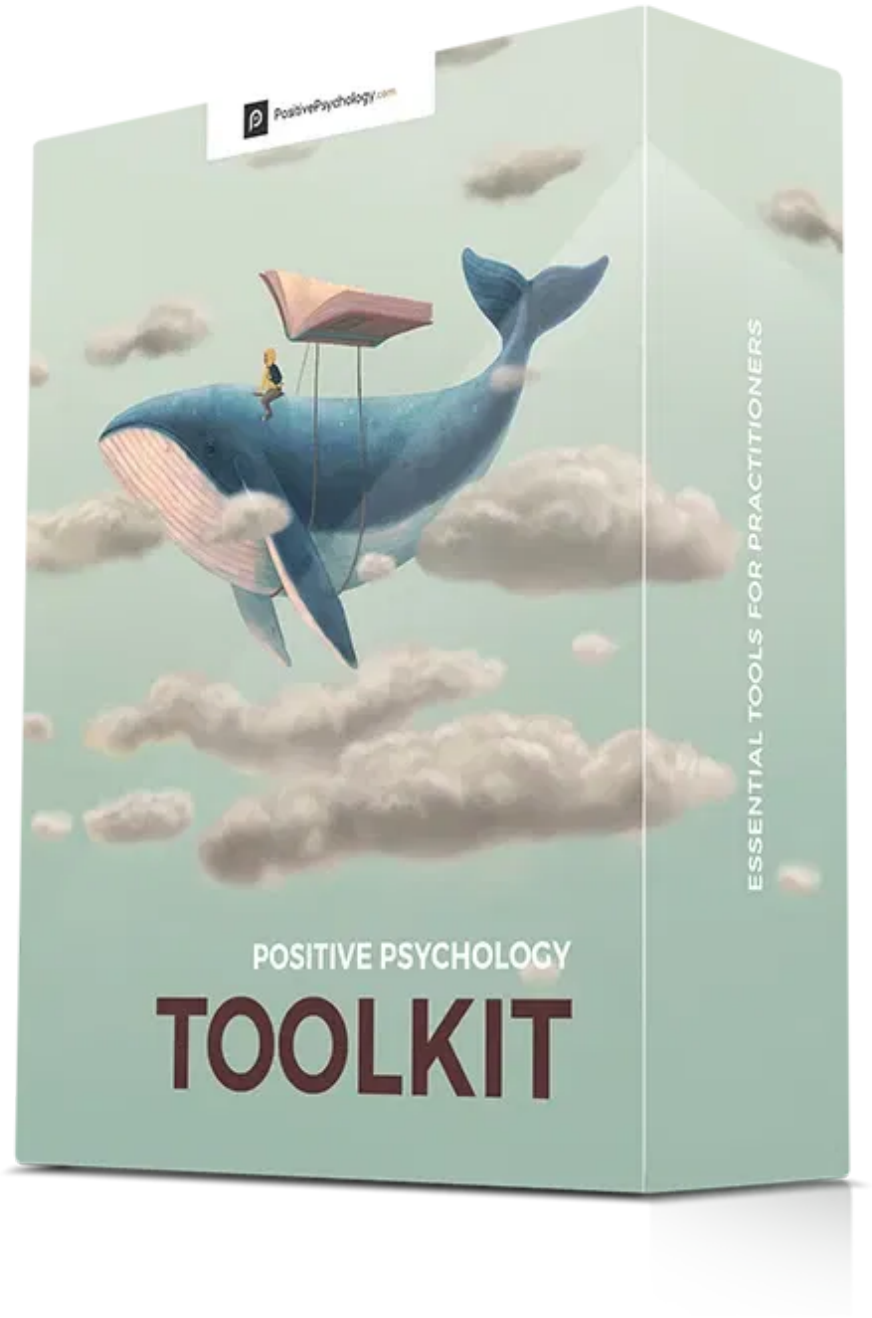
Hypothalamic regulation triggered by gratitude helps us get deeper and healthier sleep naturally every day. Gratitude and kindness help promote better sleep and energetic mornings (Zahn et al., 2009).

Gratitude reduces depression

By reducing stress hormones and managing the autonomic nervous system functions, gratitude significantly reduces symptoms of depression (Emmons & McCullough, 2003).

At the neurochemical level, feelings of gratitude are associated with an increase in the neural modulation of the prefrontal cortex, the brain site responsible for managing negative emotions like guilt, shame, and violence (Emmons & McCullough, 2003).

As a result, people who have a regular gratitude practice may be more empathetic and positive-minded.



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Since the neuroscience of gratitude confirms that gratitude can reshape the brain and change cognition, the key is finding ways to practice appreciation and gain mental benefits from it.

Simple daily actions or structured interventions and homework for clients can unlock the cognitive superpower.

Appreciate yourself

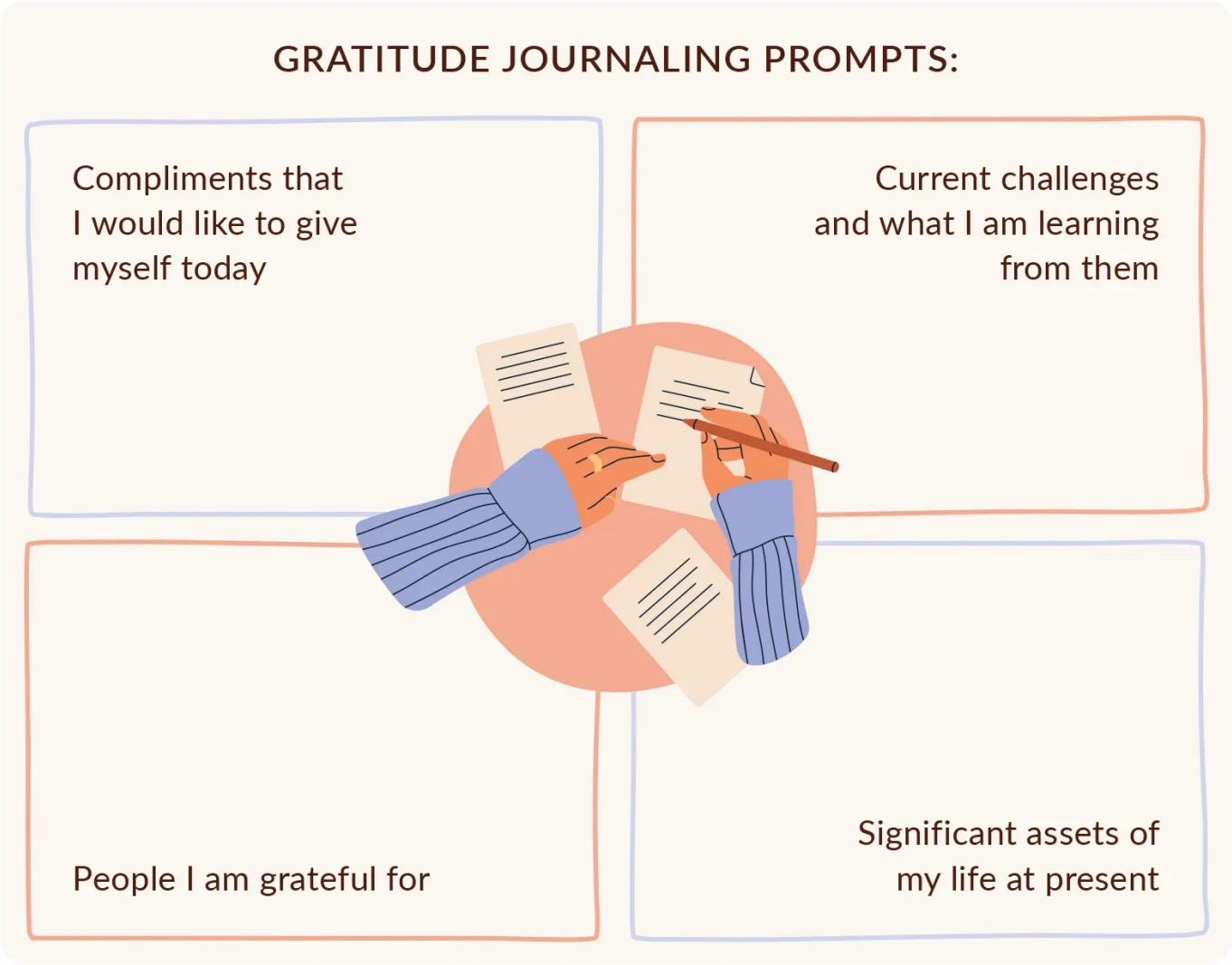
Gratitude should start with yourself. A simple practice of standing in front of the mirror and saying five good things you appreciate about yourself can do wonders for confidence and sparking joy.

This might include recognizing past achievements, present efforts, or talents and virtues. Compliment yourself with words like beautiful, loyal, disciplined, kind, and loving and notice how it makes you feel.

Gratitude journal

Gratitude journals provide a personal space to write down the things you are thankful for. Reflecting and recording gratitude forces individuals to consciously focus on good things rather than the bad.

There is power in words. A gratitude journal can look something like this:



Additional tips for gratitude journaling:

- Make journal entries specific.
- Provide depth and detail.
- Write regularly and stay consistent.
- Think about negative things that have been avoided, not just positive gifts.

Remember the good events and savor the emotions that come with the practice of journaling. For more ideas, this sister article offers journaling prompts to help you express your gratitude.

Gratitude visits

Writing a thank-you letter to someone who has made a positive impact on your life can be beneficial for both the giver and the receiver.

However, gratitude visits may have an even more powerful effect on wellbeing. These involve writing a gratitude letter, delivering the letter, and reading it out loud to the recipient.

Gratitude visits have been found to produce positive effects for individuals in the short and long term. These include general levels of happiness, an increased sense of purpose and wellbeing, and improved relationships (Stefan et al., 2021).

Gratitude meditation and exercises

Taking time to pause, be present, and reflect on specific people and aspects of life can offer powerful benefits for the mind and body. Gratitude meditation can be done daily but may provide benefits in as little as one session.

In addition, there is a wealth of gratitude exercises that can be implemented into therapy and coaching sessions or given to clients as homework.

This five-minute meditation ends with a reflection of gratitude:

5 Minute guided meditation for gratitude - The Mindful Movement

Not only can gratitude be directly implemented into therapy and coaching, but it can be added in subtle ways as well.

Clients can start increasing gratitude by developing more awareness and taking time to pause and observe. Start sessions with a quick body scan or mindful breathing exercise, and then ask them to reflect on one thing they are grateful for since the last meeting.

Teaching clients to live lives that are more grateful can induce the neurobiological benefits discussed in this article. Here are three options:

1. Encourage clients to create visual reminders to be grateful on a daily basis. This might include positive affirmations, pictures of people and places they are grateful for, or reminders of past success, accomplishments, or fond memories.
2. Reinforce grateful language in sessions. Grateful individuals use words like gifts, givers, blessing, fortunate, and abundance (McCraty & Childre, 2004). Focus on topics, ideas, and language that are inherently

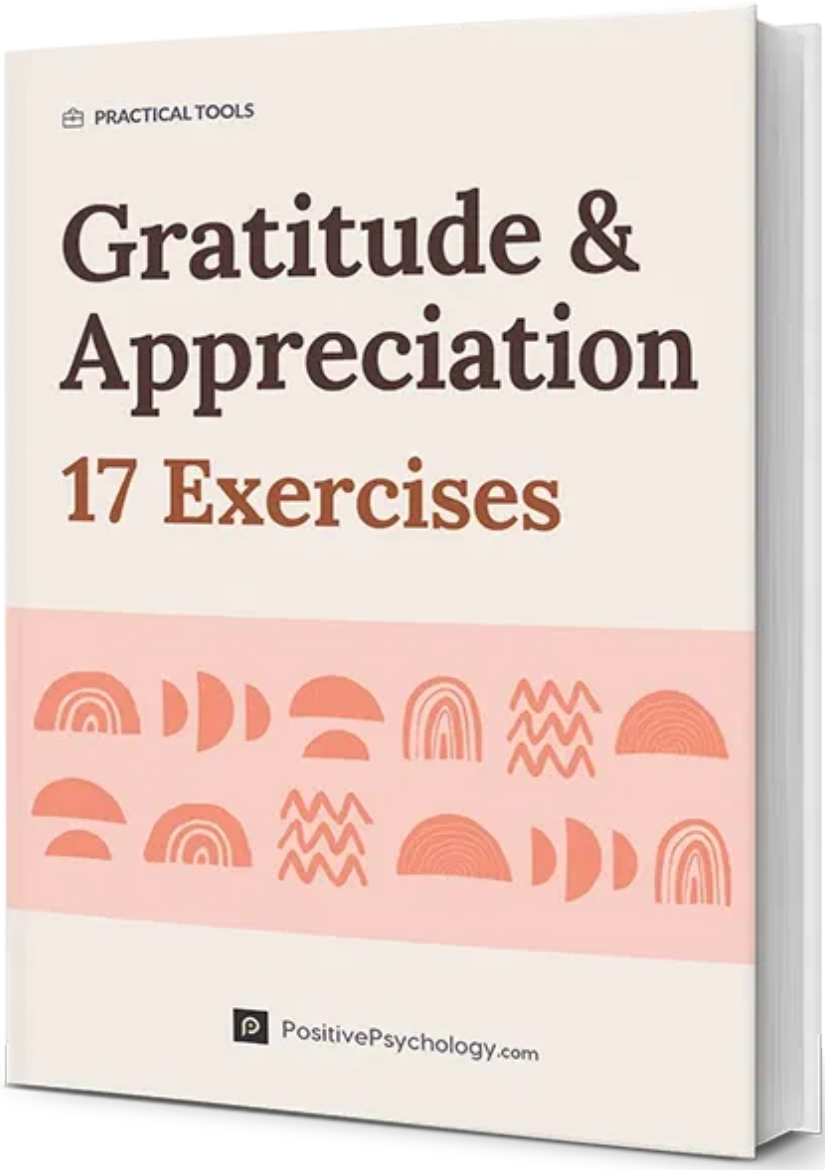
good, rather than inherently bad.
3. Use gratitude exercises such as journaling, writing out things they are grateful for, and gratitude meditations to help clients deal with specific issues, develop resilience, and improve relationships.

The Future of Gratitude Research in Neuroscience

The understanding of neuroscience and gratitude continues to evolve. It is evident that the emotion of gratitude has a direct relationship with the body and brain (Hazlett et al., 2021).

Future research may examine neurotechnology, brain–computer devices, artificial intelligence, and neurostimulation to explore various facets of the brain and gratitude. It may be possible to increase an individual's natural capacity to experience gratitude and the mental, emotional, and physical benefits it can offer.

Exploring the long-term effects of gratitude can also help therapists and coaches create strategies and treatment plans to harness its benefits for specific interventions.



17 Exercises To Nurture Gratitude & Appreciation

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Resources From PositivePsychology.com

PositivePsychology.com offers a wide selection of resources that clients can use to start or enhance a regular gratitude practice and experience its benefits.

As mentioned, a gratitude journal worksheet is a simple and excellent way to begin. This worksheet provides specific prompts that can be used as bullet points and expanded into more depth and detail.

This reflection worksheet can be more than just exploring who clients are, where they come from, and what their values are. Clients can use each of the headings to reflect on three things they are grateful for in the specific area.

Much like the gratitude visit described earlier, this worksheet encourages and guides clients to show appreciation for people in their life. It provides a variety of ideas for demonstrating gratitude.

If you're looking for more science-based ways to help others harness the benefits of gratitude, consider this collection of 17 validated gratitude tools for practitioners. Use them to help others shift to a more positive mindset and experience the joys of life more deeply.

A Take-Home Message

The neuroscience of gratitude shows how such a simple yet powerful emotion has the capacity to change our minds, relationships, and general wellbeing.

While we experience gratitude subjectively, the feeling influences neural pathways that affect physiological and psychological health.

Practicing gratitude is synonymous with expressing our feelings for others and ourselves. By using simple words of love and praise, we make others feel good, and we will also feel a lot better about ourselves and our lives.

Gratitude can provide renewed insight and hope for every day.

We hope you enjoyed reading this article. Don't forget to download our five positive psychology tools for free.

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Frequently Asked Questions

How does gratitude change the brain?

What are the neurological benefits of gratitude?

Which part of the brain is more active when we feel gratitude?

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About the author

Dr. Melissa Madeson, Ph.D., believes in a holistic approach to mental health and wellness and uses a person-centered approach when working with clients. Currently in full-time private practice, she uses her experience with performance psychology, teaching, and designing collegiate wellness courses and yoga therapy to address a range of specific client needs.

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