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The Science of Gratitude



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EXECUTIVE SUMMARY

Throughout history and around the world, religious leaders and philosophers have extolled the virtue of gratitude. Some have even described gratitude as “social glue” that fortifies relationships—between friends, family, and romantic partners—and serves as the backbone of human society.

But what exactly is gratitude? Where does it come from? Why do some people seem to be naturally more grateful than others? And are there ways we can foster more feelings and expressions of gratitude?

Over the past two decades scientists have made great strides toward understanding the biological roots of gratitude, the various benefits that accompany gratitude, and the ways that people can cultivate feelings of gratitude in their day-to-day lives. The studies comprising this science of gratitude are the subject of this paper.

What Is Gratitude?

Most people have an instinctive understanding of what gratitude is, but it can be surprisingly difficult to define. Is it an emotion? A virtue? A behavior? Indeed, gratitude can mean different things to different people in different contexts. However, researchers have developed some frameworks for conceptualizing gratitude so that it can be studied scientifically.

For example, Robert Emmons and Michael McCullough define gratitude as a two-step process: 1) “recognizing that one has obtained a positive outcome” and 2) “recognizing that there is an external source for this positive outcome.”

While most of these positive benefits come from other people—hence gratitude’s reputation as an “other-oriented” emotion—people can also experience gratitude toward God, fate, nature, etc.

Some psychologists further categorize three types of gratitude: gratitude as an “affective trait” (one’s overall tendency to have a grateful disposition), a mood (daily fluctuations in overall gratitude), and an emotion (a more temporary feeling of gratitude that one may feel after receiving a gift or a favor from someone). Most of the studies in this paper focus on trait (or “dispositional” gratitude) and/or gratitude as an emotion.

The Origins Of Gratitude

Research suggests that gratitude is not simply a cultural construct. It has deep roots that are embedded in our evolutionary history, our brains and DNA, and in child development.

Animals as diverse as fish, birds, and vampire bats engage in “reciprocal altruism” activities—behaviors that one animal performs to help another member of their species, even at a cost to themselves, presumably because they recognize at some instinctual level that the other individual may repay the favor at a later date. Many scientists see this desire to repay generosity as an expression of gratitude. In fact, some scientists suggest that gratitude may have evolved as a mechanism to drive this reciprocal altruism, thereby turning strangers into friends and allies who are more likely to help one another.

Support for the idea that gratitude may have arisen as an evolutionary adaptation comes in part from research on primates. Studies have found that chimpanzees are more likely to share food with a chimpanzee that had groomed them earlier in the day and are more likely to help another chimpanzee with a task if that chimpanzee had helped them in the past.

Studies from neuroscience have identified brain areas that are likely involved in experiencing and expressing gratitude, providing further evidence for the idea that gratitude is an intrinsic component of the human experience. Additionally, a few studies have identified specific genes that may underlie our ability to experience gratitude.

Recent studies have also begun exploring the developmental roots of gratitude. This work suggests that even fairly young children have some concept of gratitude that develops as they mature. Again, this suggests that the roots of gratitude run deep.

Individual Factors Linked To Gratitude

Even if humans as a species have a general propensity for gratitude, what determines whether an individual feels grateful or not? Research has linked a variety of factors—including personality factors, cognitive factors, and gender—to one’s likelihood of experiencing gratitude or having a grateful disposition.

Several studies have explored whether certain personality factors—such as extraversion, agreeableness, conscientiousness, neuroticism, or openness to experience—are associated with dispositional gratitude; their results have differed. Other studies have found evidence suggesting that gratitude may be conceptualized as its own personality factor.

There are a number of cognitive factors that can influence how much gratitude a person feels in a certain situation. These include the perceived intentions of the benefactor (i.e., whether the benefactor was seen as acting out of pure altruism or due to selfish motives, such as wishing to improve their reputation), the apparent cost to the benefactor, the perceived value of the gift/favor to the recipient, whether the gift/favor was provided by choice versus obligation, and the extent to which the receiver believes in free will.

Several studies have found that girls and women report feeling more grateful than boys and men, possibly because boys and men—at least in the United States—may be more likely to associate gratitude with weakness or indebtedness.

Other studies have identified certain traits that act as barriers to gratitude. These include envy, materialism, narcissism, and cynicism.

Social And Cultural Factors Linked To Gratitude

Research also suggests that social factors—including religion, cultural influences, and parenting styles—may influence a person’s tendency to experience gratitude.

Multiple studies report associations between elements of religiosity/spirituality and dispositional gratitude, suggesting that there may be a link between religion and gratitude. One study found that people assigned to pray for their partner, or pray in general, for four weeks reported higher gratitude at the end of the study than people who were assigned to think about their daily activities or to think positive thoughts about their partner. However, another study found that priming people to think about religious concepts did not increase their gratitude or generosity.

Culture may also influence people’s experiences of gratitude. For example, one study found that men in the United States reported experiencing gratitude less frequently than those in Germany, and another study found that American, Brazilian, Chinese, and Russian children differed in the ages and extent to which they expressed different forms of gratitude.

A few studies have looked at how parents might influence their children’s gratitude experiences. For example, a study of fourth and fifth grade students and their biological parents found a small but statistically significant relationship between the self-reported gratitude of the children and their mothers, but not between the children and their fathers. Another study explored why more grateful parents might have more grateful children, finding that more dispositionally grateful parents were more likely to place their children in situations that might evoke feelings of gratitude, such as volunteering for people in need.

Individual Benefits Of Gratitude

Research suggests that gratitude may be associated with many benefits for individuals, including better physical and psychological health, increased happiness and life satisfaction, decreased materialism, and more.

A handful of studies suggest that more grateful people may be healthier, and others suggest that scientifically designed practices to increase gratitude can also improve people’s health and encourage them to adopt healthier habits.

Many more studies have examined possible connections between gratitude and various elements of psychological well-being. In general, more grateful people are happier, more satisfied with their lives, less materialistic, and less likely to suffer from burnout. Additionally, some studies have found that gratitude practices, like keeping a “gratitude journal” or writing a letter of gratitude, can increase people’s happiness and overall positive mood.

Gratitude may also benefit people with various medical and psychological challenges. For example, one study found that more grateful cardiac patients reported better sleep, less fatigue, and lower levels of cellular inflammation, and another found that heart failure patients who kept a gratitude journal for eight weeks were more grateful and had reduced signs of inflammation afterwards. Several studies have found that more grateful people experience less depression and are more resilient following traumatic events.

Other studies suggest that gratitude may live up to its reputation as “the mother of all virtues” by encouraging the development of other virtues such as patience, humility, and wisdom.

In recent years, studies have examined gratitude’s potential benefits for children and adoles-

cents. For example, studies have found that more grateful adolescents are more interested and satisfied with their school lives, are more kind and helpful, and are more socially integrated. A few studies have found that gratitude journaling in the classroom can improve students' mood and that a curriculum designed to help students appreciate the benefits they have gained from others can successfully teach children to think more gratefully and to exhibit more grateful behavior (such as writing more thank you notes to their school's PTA).

Social Benefits Of Gratitude

Given its role as “social glue,” it should not be surprising that evidence points to gratitude's social benefits as well. Research suggests that gratitude inspires people to be more generous, kind, and helpful (or “prosocial”); strengthens relationships, including romantic relationships; and may improve the climate in workplaces.

Several studies have supported the link between gratitude and prosocial behavior. These studies have found that more grateful people are more helpful and generous and that experimentally manipulating people's feelings of gratitude can lead them to be more helpful and generous—as can activities such as writing a gratitude letter.

Gratitude is also important to forming and maintaining social relationships. Research supports what some researchers refer to as the “find, remind, and bind” function of gratitude: By attuning people to the thoughtfulness of others, gratitude helps them “find” or identify people who are good candidates for quality future relationships; it also helps “remind” people of the goodness of their existing relationships; and it “binds” them to their partners and friends

by making them feel appreciated and encouraging them to engage in behaviors that will help prolong their relationships. For example, one study found that participants who were thanked for helping a student on an assignment were more interested in affiliating with that student in the future; another study found that partners who had a series of conversations expressing gratitude to their partner reported more improvements in their personal well-being and in the well-being of their relationship than did partners who had conversations disclosing something personal about themselves.

Though there has not been a great deal of research explicitly focused on gratitude in the workplace, a handful of studies suggest that gratitude may help employees perform their jobs more effectively, feel more satisfied at work, and act more helpfully and respectfully toward their coworkers.

Gratitude Interventions

As mentioned earlier, a growing number of studies have tested the efficacy of various practices (“interventions”) designed to boost gratitude, such as counting one's blessings (gratitude journaling) and writing letters of gratitude to people whom one has never properly thanked (“gratitude letters”). These studies have helped to identify many of the benefits of gratitude described above. But results from these studies also suggest how some people might be more likely to engage with, and benefit from, certain gratitude interventions.

For starters, some studies have identified factors that influence whether people are willing to adopt and/or complete these interventions. For example, people who are naturally more curious are more likely to give gratitude interventions a try.

Other studies have found evidence that some people may be more likely to benefit from gratitude interventions than others. For example, one study found that less neurotic people reported increased happiness a week after completing a gratitude intervention, but more neurotic participants did not.

A series of meta-analysis studies have attempted to determine the efficacy of gratitude interventions, and most have concluded that gratitude interventions do appear to significantly increase happiness, well-being, and positive mood. However, the impact of these interventions on many other outcomes is less clear.

Future Directions

Research on the science of gratitude is relatively new, and thus there are still many open questions left to explore. These include studies looking at the potential dark sides of gratitude (e.g., manufacturing gratitude to manipulate people), further defining and categorizing different types of gratitude experiences, determining why some interventions work for some people but not others, and identifying how best to use gratitude interventions in the classroom and the workplace.



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Introduction

According to Cicero, gratitude is more than “the greatest virtue,” it is also “the mother of all other remaining virtues.”

In many respects, research supports this sentiment. The experience of gratitude encourages us to appreciate what is good in our lives and compels us to pay this goodness forward. People with more grateful dispositions report being happier and more satisfied with their lives. Gratitude also functions as social glue that nurtures the formation of new friendships, enriches our existing relationships, and underlies the very foundation of human society.

But what exactly is gratitude? Where does gratitude come from? Why do some people seem to be naturally more grateful than others? And are there ways we can further cultivate our feelings of gratitude? These questions and others will be explored in this paper.

This paper presents an overview of the science of gratitude, a relatively new field, focusing on papers published in the last 20 years; during that time, the number of studies of gratitude has increased significantly. These studies primarily emanate from the discipline of psychology, although relevant studies from other fields—including neuroscience, ecology, sociology, and medicine—will also be discussed.

The number of citations for a paper (as of September 2017) is indicated in brackets [] next to the paper’s citation; highly cited studies (>50 citations) are in **bold**.

A few caveats should be kept in mind while reading this paper:

1. How frequently studies have been cited can differ by academic discipline, subfield, and publication date. In some research areas (e.g., social psychology), researchers typically publish many articles each year while in others (e.g., neuroscience) they may only publish a few. Thus determining whether a particular study has been influential requires considering the context of its publication, such as its field and the year it was published. Because many studies covering the science of gratitude were published relatively recently, the true impact of these studies on the field may not be discernable for several years.
2. Partly because research on gratitude is relatively new, some of the findings cited in this paper stem from single studies. Results from a single study, especially studies with small numbers of participants, should be considered with caution (Ioannidis, 2005) [5037] (Marszalek, Barber, Kohlhart, & Cooper,

2011) [75]. Attempts to replicate some findings from psychology (Klein et al., 2014) [309] (Open Science Collaboration, 2015) [1278] have failed, casting some doubt on the validity of these findings; however, the extent to which these findings were not actually replicated (Gilbert, King, Pettigrew, & Wilson, 2016) [126] (Anderson et al., 2016) [127] (Patil, Peng, & Leek, 2016) [17] and the reasons for the lack of reproducibility (Etz & Vandekerckhove, 2016) [43] have been subjects of debate and discussion. As much as possible, this paper will discuss findings that have been replicated or generally supported by multiple studies, including meta-analyses that both combine data across multiple experiments and reanalyze these data. However, because a main goal of this white paper is to give a sense of the breadth of research on gratitude to date, particularly that which has been supported by the John Templeton Foundation (JTF), findings have not been omitted simply because they have not yet been replicated; instead, some of these studies have been included to suggest new possibilities and directions in the research. When these findings

have been supported by only a single study so far, we have tried to make that clear within the text.

The paper is divided into nine main sections, including this introductory section. The next section briefly defines gratitude and includes a short history of the science of gratitude. The third explores gratitude's evolutionary, biological, and developmental roots. The fourth section focuses on the individual factors that may influence a person's propensity to experience gratitude, while the fifth section focuses on the social and cultural factors that influence people's experiences and expressions of gratitude. The sixth and seventh sections discuss the individual and social benefits of gratitude, respectively, including its possible benefits for health, happiness, and relationships. The eighth section discusses various scientifically designed gratitude activities ("interventions") that researchers have developed in order to increase people's feelings and expressions of gratitude. The final section outlines some limitations to this research and presents promising future directions in the science of gratitude.

What is Gratitude?

Defining Gratitude

Religious traditions including Judaism, Christianity, Islam, Buddhism, and Hinduism all encourage cultivating gratitude as an important moral virtue. For millennia, gratitude has been a popular topic among philosophers:

- Cicero said gratitude “is not only the greatest one but also the mother of all the other remaining virtues”;
- Seneca “ranked ingrates below thieves, rapists and adulterers”;
- Hume wrote, “Of all crimes that human creatures are capable of committing, the most horrid and unnatural is ingratitude”;
- and Adam Smith believed that gratitude was vital for maintaining a society based on goodwill (Emmons & Crumpler, 2000) [484], (McCullough, Kilpatrick, Emmons, & Larson, 2001) [1134], (Manela, 2015).

Thus gratitude infuses our religious, cultural, and scholarly traditions, which generally maintain that gratitude is important for a person to be good and moral and a citizen of the world. But what exactly is gratitude? It depends on whom you ask.

“Gratitude has been conceptualized as an emotion, a virtue, a moral sentiment, a motive, a coping response, a skill, and an attitude. It is all of these and more,” write Robert Emmons and Cheryl Crumpler in a 2000 paper that examined the empirical research on gratitude (Emmons & Crumpler, 2000) [484]. Similarly, studies surveying attitudes about gratitude among the general public have reported a wide range of gratitude experiences (Lambert, Graham, & Fincham, 2009) [151] (Hlava & Elfers, 2013) [12] (Elfers & Hlava, 2016) [0]. Thus, gratitude can mean different things to different people in different contexts.

Yet in their influential 2003 paper, Emmons and Michael McCullough posit that gratitude can be generally distilled to a two-step cognitive process: 1) “recognizing that one has obtained a

positive outcome” and 2) “recognizing that there is an external source for this positive outcome” (Emmons & McCullough, 2003) [2376]. Because many of our benefits come from other people, gratitude is often thought of as an interpersonal or other-oriented emotion. However, Emmons and McCullough assert, people can also experience gratitude toward God, animals, fate, coincidence, nature, the weather, avoiding a mistake, and more.

Furthermore, there is evidence that gratitude can be thought of as an emotional experience with three hierarchical levels: affective trait, mood, and emotion. These three levels of gratitude can influence one another. Affective traits, as defined by psychologist Erika Rosenberg, are “stable predispositions toward certain types of emotional responding” (Rosenberg, 1998) [522]. Thus, some people may have a more grateful disposition. Moods, according to Rosenberg, “wax and wane, fluctuating throughout or across days.” And emotions are more short-term reactions to

particular events—for example, feeling grateful after receiving a gift.

A study of this hierarchical model of gratitude concluded that “grateful moods are created both through top-down effects (i.e., the effects of personality and affective traits), bottom-up effects (i.e., the effects of discrete interpersonal and emotional episodes), and the interaction of these effects” (McCullough, Tsang, & Emmons, 2004) [487]. This study found that grateful moods set the stage for more frequent and pervasive grateful emotions, yet people with more trait gratitude were more resistant to fluctuations in their daily grateful moods or emotions caused by particular events.

Many of the studies covered in this paper discuss trait gratitude (also called “dispositional gratitude”), while others focus on gratitude as an emotion or mood. Whenever possible, we try to note the type of gratitude being examined in a particular study.

A Brief History of the Science of Gratitude

While conceptualizing gratitude has historically been an area of interest for philosophers and religious scholars, until recently it had received considerably less attention from scientists. A handful of sociologists and psychologists conducted foundational work on conceptualizing gratitude as a phenomenon that could be defined and studied (Simmel, 1950) [5608], (Schwartz, 1967) [590], (Gouldner, 1960) [11509], (Heider, 1958) [23233], (Weiner & Graham, 1989) [135], (Lazarus & Lazarus, 1994) [829], (Ortony, Clore, & Collins, 1988) [7556]. But research on how people benefit from gratitude, and ways to cultivate it, were not particularly popular topics of study until Robert Emmons, Michael McCullough,

and colleagues published a series of landmark papers, reporting on the results of research largely funded by the John Templeton Foundation, in the early 2000s (McCullough et al., 2001) [1134].

Since then, and thanks in large part to JTF-funded efforts such as the **Expanding the Science and Practice of Gratitude** (ESPG) project, the field of gratitude research has blossomed. According to the PsycINFO database, in 2000, when JTF was just beginning to fund studies of gratitude, only three peer reviewed papers published that year listed “gratitude” as a major subject or keyword; that number grew to 21 papers published in 2008; and to 111 published in 2015. Further evidence that JTF funding has been fundamental to the growth of the field comes from the large number of papers that have cited Emmons and McCullough’s early gratitude papers; for example, more than 1,100 works reference their 2001 paper, “Is gratitude a moral affect?”; their 2003 study, “Counting blessings versus burdens: An experimental investigation of gratitude and subjective well-being in daily life,” has garnered more than 2,300 citations.

How Gratitude Relates to Other Emotions

Several studies have examined how gratitude relates to other emotions. Importantly, studies have found that gratitude and indebtedness (or obligation)—concepts that were often previously considered overlapping constructs—can sometimes be experimentally separated (Goei & Boster, 2005) [81]. For example, studies have found that people feel significantly more grateful when they know a helper has benevolent intentions than when a favor is given due to ulterior motives (Tsang, 2006b) [146], and a recipient’s gratitude decreases and indebtedness increases

when their benefactor expresses a greater expectation of repayment (Watkins, Scheer, Ovniczek, & Kolts, 2006) [253]. Additionally, more self-focused people tend to experience more indebtedness and less gratitude (Mathews & Green, 2010) [45].

Other studies have attempted to distinguish gratitude from other positive emotions, such as elevation, the emotion that one feels when witnessing moral actions (Haidt, 2000) [260] (Fredrickson, 2004) [491]. Work by Sara Algoe and Jonathan Haidt, for example, suggests that the three “other-praising emotions”—elevation, gratitude, and admiration—can be separated based on the outcomes that these emotions motivate: “elevation (a response to moral excellence) motivates prosocial and affiliative behavior, gratitude motivates improved relationships with benefactors, and admiration motivates self-improvement” (Algoe & Haidt, 2009) [575].

Gratitude is also often conflated with appreciation. One study defines appreciation as “acknowledging the value and meaning of something—an event, a person, a behavior, an object—and feeling a positive emotional connection to it” and treats gratitude as one of eight key facets of appreciation: “The gratitude aspect of appreciation refers to noticing and acknowledging a benefit that has been received, whether from another person or deity, and feeling thankful for the efforts, sacrifices, and actions of an ‘other’” (Adler & Fagley, 2005) [401]. Another study found that appreciation “made a significant unique contribution to life satisfaction” after controlling for both other personality factors and trait gratitude, a result that suggests appreciation may be worthy of further consideration in its own right, independent of gratitude. However, yet

another study found that people’s levels of appreciation and their dispositional gratitude levels are highly correlated with one another; this result suggests that appreciation and gratitude may be too interrelated to be considered separate traits (Wood, Maltby, Stewart, & Joseph, 2008) [163]. Thus the scientific distinctions between appreciation and gratitude are still a matter of debate and discussion.

Methods for Measuring Gratitude

In order to truly study gratitude, one needs to be able to measure it. Thus, the burgeoning interest in gratitude research in psychology over the past few decades has been accompanied by the development of questionnaires and surveys to quantify gratitude, the most popular of which are discussed below.

The Gratitude Adjective Checklist (GAC)

The Gratitude Adjective Checklist is a simple survey that asks people to report on a 1-5 scale how much they have felt each of the following adjectives: 1) Grateful, 2) Thankful, and 3) Appreciative (McCullough, Emmons, & Tsang, 2002) [1798]. A person’s GAC score is the sum of those numbers. Because of the general nature of this measure, it can be used to measure gratitude as an emotion, a mood, or a disposition by limiting people to report their levels of the three adjectives within a certain time period (now, in the last few weeks, or in general).

The Gratitude Questionnaire-6 (GQ-6)

The Gratitude Questionnaire-6 (GQ-6) was designed to measure a person’s level of gratitude as an affective trait or disposition, their so-called “trait gratitude” (McCullough et al., 2002) [1798].

This is the full GQ-6 (items 3 and 6 are reverse scored):

The Gratitude Questionnaire–6 (GQ-6)

Using the scale below as a guide, write a number beside each statement to indicate how much you agree with it. 1 = strongly disagree 2 = disagree 3 = slightly disagree 4 = neutral 5 = slightly agree 6 = agree 7 = strongly agree

- ___ 1. I have so much in life to be thankful for.
- ___ 2. If I had to list everything that I felt grateful for, it would be a very long list.
- ___ 3. When I look at the world, I don't see much to be grateful for.
- ___ 4. I am grateful to a wide variety of people.
- ___ 5. As I get older I find myself more able to appreciate the people, events, and situations that have been part of my life history.
- ___ 6. Long amounts of time can go by before I feel grateful to something or someone.

The GQ-6 has been used to measure trait gratitude in many of the studies cited in this paper. A Chinese version of the GQ-6 was validated in a study of Taiwanese undergraduates (L. H. Chen, Chen, Kee, & Tsai, 2009) [86].

The Gratitude Resentment and Appreciation Test (GRAT)

The Gratitude Resentment and Appreciation Test (GRAT) is another survey used to measure trait gratitude (Watkins, Woodward, Stone, & Kolts, 2003) [628]. Similar to the GQ-6, participants are asked to rate their agreement or disagreement with a series of statements such as, “Life has been good to me,” “I couldn't have gotten where I am today without the help of many people,” “I love to sit and watch the snow fall,” and “I think that it's important to sit down every once in a while and ‘count your blessings.’”

The GRAT contains subscales for measuring these different aspects of gratitude: 1) Lack of Sense of Deprivation (or Sense of Abundance), 2) Appreciation for Simple Pleasures, and 3) Social Appreciation.

The Transpersonal Gratitude Scale (TGS)

The Transpersonal Gratitude Scale (TGS) was designed to include the transcendent aspects that can accompany feelings of gratitude (Hlava, Elfers, & Offringa, 2014) [3]. It is a 16-item scale that contains four subscales: expression of gratitude (“I show appreciation to others when they have positively influenced my life”), value of gratitude (“Gratitude helps me feel more open with others”), transcendent gratitude (“I feel grateful for just being alive”), and spiritual connection (“I am grateful to a divine being for everything in my life”).

The Multi-Component Gratitude Measure (MCGM)

The Multi-Component Gratitude Measure was developed to measure gratitude as a moral virtue (Morgan, Gulliford, & Kristjánsson, 2017) [2]. According to the designers of this scale, the GQ-6 and GRAT fail to capture the complexities of how different people experience gratitude, and these scales also do not measure grateful behaviors.

The MCGM measures four components of gratitude: 1) conceptions (or understandings) of gratitude; 2) grateful emotions; 3) attitudes toward gratitude; and 4) gratitude-related behaviors. Some people are above average on all the components (the most grateful) while others may be high on one or two and low on the others, or below average on all four components (the least grateful).

Measuring gratitude in children and adolescents

There is growing interest in studying gratitude in children and adolescents. A 2011 study examined whether existing gratitude assessment measures—which were created and tested with adult subjects—could be used in adolescents (Froh, Fan, et al., 2011) [150]. This study found that scores on the GQ-6, GRAT, and GAC were positively correlated with one another for 14 to 19 year olds, but the GQ-6 and GAC are better scales to use when testing gratitude in 10 to 13 year olds. The researchers caution that measuring gratitude in children younger than 10 may require relying on parental reports and/or developing different scales (due to the large developmental window in which gratitude gradually emerges, as well as possible reading comprehension issues). However, scales to measure gratitude in younger children are currently under develop-

ment through Giacomo Bono's Youth Gratitude Project, which is part of the ESPG project.

Expression of Gratitude in Relationships Measure

The Expression of Gratitude in Relationships Measure is a simple scale for measuring grateful behaviors in relationships. Participants rate how frequently they perform the following behaviors, using a 5-point scale (1 being “never;” 5 being “very frequently”), and the numbers are added together to produce a single expression of gratitude score (Lambert, Clark, Durtschi, Fincham, & Graham, 2010) [164]:

1. I express my appreciation for the things that my partner does for me.
2. I let my partner know that I value him/her.
3. When my partner does something nice for me I acknowledge it.



Origins of Gratitude

In addition to gratitude's deep roots in our spiritual and philosophical history, research suggests that it has even deeper biological roots—roots that appear to be embedded in our evolutionary history, in the structure of our brains and DNA, and in child development. Without a doubt, gratitude is heavily influenced by culture, but it also appears to be an inherent part of human nature.

Evolutionary Origins

Evidence suggests that gratitude has deep roots in humans' evolutionary history. To uncover these roots, researchers have looked for evidence of grateful behaviors among our non-human relatives.

Of course, these researchers have assumed that gratitude is expressed differently among non-human species than among humans—it's unlikely that many non-humans will write "thank you" notes. So for evidence of gratitude across species, researchers have investigated whether and how non-human species who receive a gift or a favor reciprocate in some way toward their benefactor, drawing on the observation that feelings of gratitude can inspire reciprocal acts of generosity toward those to whom we are feeling grateful.

Support for the idea that gratitude may have arisen as an evolutionary adaptation comes from research on primates (Bonnie & de Waal, 2004) [86]. Besides compelling anecdotes about chimpanzees showing gratitude towards humans—hugging a caretaker after being brought inside from the rain, for example—there is evidence that some primate social groups rely

on intricate reciprocal exchanges that likely are powered by at least a prototypical form of gratitude. One study found that chimpanzees were more likely to share their food with another chimpanzee who had groomed them earlier that day (De Waal, 1997) [383]. Another experiment, in which chimpanzees required help from a partner to retrieve a tray of food, found that chimpanzees were most likely to help a chimpanzee if that particular chimpanzee had helped them in the past (Suchak, Eppley, Campbell, & de Waal, 2014) [22].

Indeed, species as diverse as fish, birds, and vampire bats all display what is termed "reciprocal altruism": They will initiate a behavior that helps another, unrelated individual even at a cost to themselves, presumably because they recognize at some instinctual level that that individual may repay the favor at a later date (Trivers, 1971) [10668]. In an influential paper introducing the concept of reciprocal altruism, Robert Trivers drew from these animal examples and hypothesized that "the emotion of gratitude has been selected to regulate human response to altruistic acts and that the emotion is sensitive to the cost/benefit ratio of such acts."

In fact, the relationship between gratitude and reciprocal altruism may help explain the finding that people feel more grateful for benefits provided by strangers or more distant acquaintances than they do for similar benefits provided by close relatives (as seen in (Bar-Tal, Bar-Zohar, Greenberg, & Hermon, 1977) [166] and (Rotkirch, Lyons, David-Barrett, & Jokela, 2014) [23]) and that gratitude increases people's trust in others—but only toward people they don't know well already (Dunn & Schweitzer, 2005) [98].

While other evolutionary pressures motivate people to help those with whom they share their genetic material, gratitude may have “evolved to help people convert acquaintanceships with nonkin into relationships that can support reciprocal altruism” suggest McCullough and colleagues (McCullough, Kimeldorf, & Cohen, 2008) [294]. Sara Algoe suggests a similar function for gratitude in her “find-remind-and-bind” theory of gratitude, which explains how gratitude helps people identify and form close bonds with good relationship partners (this theory is discussed more in a later section) (Algoe, 2012) [147]. Furthermore, theoretical work suggests that gratitude may have played a role in the evolution of another form of reciprocal altruism: upstream reciprocity, which is when receiving benefits from one individual spurs someone to show generosity toward a third party (Nowak & Roch, 2007) [189].

Together this research suggests that gratitude may have played an important role in human social evolution and may help explain why feelings and expressions of gratitude are ubiquitous across different cultures and societies (McCullough et al., 2001) [1134].

Biological Origins

Over the past few years there has been growing interest in determining the biological correlates of gratitude and other positive emotions, particularly with regards to neuroanatomy and genetics.

Gratitude and the brain

A handful of neuroimaging studies have shed light on brain areas that are likely involved in experiencing and expressing gratitude.

One functional magnetic resonance imaging (fMRI) study found that experiencing emotions involved in maintaining social values, such as pride and gratitude, activated areas in the mesolimbic and basal forebrain, regions involved in feelings of reward and the formation of social bonds (Zahn et al., 2009) [234]. A follow-up study found that people who more readily experience gratitude have more gray matter in their right inferior temporal cortex, an area previously linked to interpreting other people's intentions (Zahn, Garrido, Moll, & Grafman, 2014) [19].

Another fMRI study that asked participants to imagine they were Holocaust survivors who had received gifts such as shelter or lifesaving food from strangers found that people who imagined that they would feel more grateful in these scenarios had more brain activity in the medial prefrontal cortex (PFC) and anterior cingulate cortex (ACC), brain regions associated with moral cognition, perspective taking, and reward (Fox, Kaplan, Damasio, & Damasio, 2015) [16]. Similarly, an older study found that the ACC and dorsomedial and ventromedial PFC (DMPFC and VMPFC) were activated when participants imagined being helped

by someone—although this study did not ask participants whether or not they felt grateful (Decety & Porges, 2011)[70].

Together these studies suggest that gratitude involves assessing the moral intentions and actions of others, is inherently social (or “other praising”), and likely feels rewarding as well, especially for more grateful people—meaning that it could be self-perpetuating.

Research suggests that more grateful people may also have more neural hallmarks of altruism. A recent study found that people with more trait gratitude appeared to have more altruistic brains, as shown by the response of their VMPFC and other brain areas associated with feelings of reward, when they were told that a charity would receive money (Karns, Moore, & Mayr, 2017) [0]. Furthermore, this neural response could be strengthened: It was stronger in participants who had been assigned to keep a gratitude journal for three weeks than it was in participants who were assigned a different (non-gratitude) journaling activity. This suggests that practicing gratitude changes the brain in a way that orients people to feel more rewarded when other people benefit, which could help explain why gratitude encourages prosocial behavior.

While these studies focused on determining the neural correlates of experiencing gratitude, scientists are also interested in how expressing gratitude is processed in the brain. In one study, participants were given the opportunity to express gratitude by donating to charity some of the money they had received in an experiment (they were also asked how motivated they were to do so by gratitude, by a desire to help the cause, and/or by guilt) (Kini, Wong, McInnis, Gabana, & Brown, 2016) [8]. Greater gratitude expres-

sion—i.e., giving more money to the charity—was correlated with more activity in the parietal and lateral prefrontal cortex, areas of the brain associated with making mental calculations, suggesting that gratitude is a cognitive—not just emotional—process. This study also found that participants who had written gratitude letters in a therapeutic intervention expressed more gratitude and had more activity three months later in their pregenual anterior cingulate cortex, an area involved in predicting the outcomes of actions, suggesting that a simple gratitude intervention can have lasting brain changes even months after the intervention ends. The researchers propose an interesting interpretation of their findings: Practicing gratitude may increase brain activity related to predicting how our actions affect other people. “To the extent one predicts and evaluates the likely effects of one’s actions on others,” they write, “one might be more willing to direct those actions towards having a positive impact on others.”

Together these studies suggest gratitude’s deep roots in human cognition, emotion, and behavior and also hint at how activity differences in various brain regions may relate to differences in gratitude across individuals.

Gratitude and genetics

A few studies have examined whether genetics may explain why some people have higher dispositional gratitude than others. In one study, twins filled out a survey (Values in Action) in which they rated the extent to which they felt they exemplified 24 character strengths (Steger, Hicks, Kashdan, Krueger, & Bouchard, 2007) [123]. Similar to other results of twin studies that have identified the genetic components of

psychological traits, the strength of the correlation in self-reported gratitude was greater among identical twins—who are essentially genetically identical—than among fraternal twins—who share 50 percent of their DNA—suggesting that there may be a genetic component to gratitude.

What genes may underlie this genetic component of gratitude? One study found that a particular variation in the CD38 gene, which is involved in the secretion of oxytocin (often referred to popularly as “the love hormone”), was significantly associated with the quality and frequency of expressions of gratitude toward a romantic partner in both a laboratory setting and in daily life (Algoe & Way, 2013) [26]. These results suggest that oxytocin, a hormone implicated in social bonding, may also be involved in feelings of gratitude, “the glue that binds adults into meaningful and important relationships.” Another recent study found that individuals with particular variants of the COMT gene, which is involved in the recycling of the neurotransmitter dopamine in the brain, reported more dispositional gratitude, suggesting that dopamine may also play a role in the experience of gratitude (Liu, Gong, Gao, & Zhou, 2017) [1].

Again, these studies suggest that gratitude is an intrinsic part of being human, part of the very building blocks of human biology.

Developmental Origins

While research suggests that gratitude has deep evolutionary and biological roots, other researchers have studied how gratitude develops throughout childhood. These studies not only point to the deep human propensity for gratitude but may also suggest parenting and educational strategies for further developing this virtue in childhood.

Research suggests that as children mature and develop, so do their expressions of gratitude. A 1938 study of Swiss children between the ages of seven and 15 found that concrete gratitude (wishing to give a benefactor something in return) was seen more in younger children while verbal gratitude (thanking the person) was seen more frequently in older children, although there was also a good deal of individual variability (Baumgarten-Tramer, 1938) [129]. A later study found that eleven-year-old or older Trick-or-Treaters spontaneously said “thank you” four times more often than children younger than six, again suggesting that children increase in their tendency to express gratitude as they get older (Gleason & Weintraub, 1976) [205]. However, recent cross-cultural studies have found cultural differences in the development of different forms of gratitude expression, suggesting that socialization—via parents and the larger culture—likely plays an important role in the development and manifestation of gratitude in children (Wang, Wang, & Tudge, 2015) [17] (Tudge, Freitas, & O’Brien, 2016) [2].

While these studies may tell us something about how children become socialized to express grateful sentiments, they do not tell us much about how children experience feeling gratitude. Studies of young children have found that most children have some understanding of gratitude by age five—they associate receiving something with a positive feeling that is sometimes tied to a particular benefactor (J. A. Nelson et al., 2013) [27]. There is individual variability here, too: Children with better knowledge of emotions at age three, and those who were more understanding of the mental states of others at age four, showed more understanding of gratitude

at age five. Research also suggests that feelings of gratitude—such as they are—are not impacted by a benefactor’s motives for five- and six-year-old children, but older children feel less grateful when they are told that someone is being kind just to follow the rules (Graham, 1988) [132]. Additionally, while children as young as six can recognize that gratitude differs from expressing good manners, they have difficulty answering prompts used to measure gratitude in adults, suggesting that they may have different concep-

tualizations of gratitude from adults (Hussong, Langley, Coffman, Halberstadt, & Costanzo, 2017) [2].

Taken together, these studies suggest a proclivity for gratitude that exists early in human development, though it seems that a host of factors help determine how much gratitude an individual actually experiences and expresses. Those factors are the focus of the next two sections, which include a further look at how gratitude develops in youth.

Individual Factors Linked to Gratitude

When receiving a gift or a favor, what determines whether a person feels grateful or not? Research has linked a variety of factors to one's likelihood of experiencing gratitude or having a grateful disposition. These include personality factors, cognitive factors, and gender.

Personality Factors

Researchers have examined the extent to which gratitude is associated with various personality factors and whether gratitude or gratefulness could be considered its own personality trait.

Associations between gratitude and other personality factors

There is no conclusive evidence that a person's propensity for a grateful disposition can be reduced to a combination of the Big Five personality traits (Agreeableness, Conscientiousness, Extraversion, Neuroticism, and Openness) (Saucier & Goldberg, 1998) [420] (McCullough et al., 2002) [1798]. While several studies have reported associations between individual traits (or subsets of traits) and gratitude, their results have been quite variable. For example, while studies have found associations between gratitude and some of these traits—such as extraversion and agreeableness—these associations have not been consistent across studies and populations (McCullough et al., 2004) [487] (Neto, 2007) [89] (Breen, Kashdan, Lenser, & Fincham, 2010) [60] (Reckart, Huebner, Hills, & Valois, 2017)[1], calling into question the idea that people with any specific combination(s) of these traits are reliably more or less grateful than others.

Is gratitude a personality trait?

If some people are clearly more grateful than others, but one's propensity for gratitude cannot be explained by existing personality factors, should dispositional gratitude be categorized as its own personality trait?

One potential sticking point is whether gratitude can be sufficiently separated from appreciation, as discussed earlier (Adler & Fagley, 2005) [401]. While results from one study suggest that gratitude and appreciation are so related that they could be considered a single personality trait (Wood, Maltby, Stewart, & Joseph, 2008) [163], results from another study suggest that it may be useful to consider them as separate emotional constructs (Fagley, 2012) [58].

If trait gratitude is a personality trait, how does it relate to state gratitude? One study suggests that, given the same circumstances, more dispositionally grateful people feel more grateful than less dispositionally grateful people. In other words, a person with a more grateful personality may be more prone to feel grateful in a particular scenario than would a person with a less grateful personality (Wood, Maltby, Stewart, Linley, & Joseph, 2008) [255]. Still, it remains a matter of debate whether gratitude actually is a personality trait to begin with.

Cognitive Factors

The ways that we think about a gift or a giver can increase or decrease the likelihood we will feel gratitude in a certain situation. In particular, studies have found that how participants see the intention of the benefactor, the cost to the benefactor, and the value of the benefit are all independently and significantly associated with the level of gratitude reported by these participants (Tesser, Gatewood, & Driver, 1968) [311] (Lane & Anderson, 1976) [65] (Tsang, 2007) [122].

More specifically, there is evidence that people feel more grateful when they believe that a helper has more autonomous motivation for their actions, such as when that person helps someone who is lost out of a sense of care for the lost person rather than because the person was taught to be helpful to lost people (Weinstein, DeHaan, & Ryan, 2010) [43]. In a similar vein, one study found that people who believe more in free will or who have been experimentally primed to feel more free will saw a benefactor's actions as more sincerely motivated and experienced more gratitude (MacKenzie, Vohs, & Baumeister, 2014) [27]—if you believe that people can choose whether or not to be kind (vs. having their actions be predetermined), you'll be more grateful when people actually choose kindness. Similarly, a recent neuroimaging study found that people had increased activity in their VMPFC, a brain area associated with reward, when someone else intentionally helped them than when that person was required to do so. This increased activity correlated with increased gratitude and expressions of gratitude (giving money to that person in an economic game), again suggesting that a benefactor's intention does influence a recipient's experience of gratitude (Yu, Cai, Shen, Gao, & Zhou, 2017) [1].

Together these results suggest that people feel most grateful when they perceive that a benefactor acted with free will and autonomous motivation. Another study, however, found that in an achievement context, such as when completing a test, a recipient's gratitude for help was influenced by their perception of their own autonomy over the outcome of the test. In other words, people had to believe they were responsible for their own success in order to feel gratitude for the help that they received (Chow & Lowery, 2010) [15].

Other studies have identified additional factors that can shape how we perceive acts of generosity and, thus, how much gratitude we feel and express as a result. For example, one study found that the amount of gratitude that a person felt following a particular hypothetical favor or gift depended on how that favor or gift compared to previous hypothetical help given by other friends (Wood, Brown, & Maltby, 2011) [49], and another study found that people felt (and expressed) more gratitude when someone was unexpectedly generous (Smith, Pedersen, Forster, McCullough, & Lieberman, 2017) [0]. In other words, we evaluate the gifts from a benefactor relative to how we expect that benefactor to behave toward us.

That said, while some studies have found that people feel less gratitude when benefits feel expected or obligatory—as they often do coming from a sibling or other close relative (Bar-Tal et al., 1977) [166]—a recent study found that, counter to the researchers' expectations, gratitude was more related to the value of the benefit received rather than to the participant's expectations of generosity from people more or less close to them (Forster, Pedersen, Smith, McCullough,

& Lieberman, 2017) [3]. The researchers note that the discrepancy between the findings from this study and previous studies may be due to the design of this particular experiment but may also point to the need to further refine and test how people's expectations of other people's generosity influences gratitude.

Gender

Several studies have investigated whether there are gender differences in gratitude.

In studies of children and adolescences, girls report being more grateful than boys (Froh, Yurkewicz, & Kashdan, 2009) [331] (Reckart et al., 2017) [1] (Froh, Emmons, Card, Bono, & Wilson, 2011) [180]. One study, though, suggests that boys may derive more social benefits from gratitude since they showed a stronger association between gratitude and emotional support from family. However, it's also possible that gratitude might be a consequence of that support rather than a cause of it (Froh, Yurkewicz, et al., 2009) [331].

Adult women also report more trait gratitude than adult men (Sun & Kong, 2013) [23] (Kong, Ding, & Zhao, 2015) [41] (Morgan et al., 2017) [2] (Yost-Dubrow & Dunham, 2017) [0]. A study of college students and older adults found that "men were less likely to feel and express gratitude, made more critical evaluations of gratitude, and derived fewer benefits" (Kashdan, Mishra, Breen, & Froh, 2009) [246]. And other studies have found that women were more likely to report feeling grateful to God than were men (Krause, 2006) [144] (Krause, Emmons, Ironson, & Hill, 2017) [0].

It is important to note that some men may associate gratitude with weakness, perhaps due

to its relationship to indebtedness, and thus may report lower levels of gratitude (Kashdan et al., 2009) [246]. Further research is needed to determine whether men actually do experience less gratitude, as well as which mechanisms could explain this difference. Insight may come from cross-cultural comparisons. A study comparing the experience of emotions in men and women of different ages from the United States and Germany found that German men reported experiencing gratitude significantly more often than the American men did (Sommers & Kosmitzki, 1988) [54]. They also "tended more than the American men to evaluate gratitude positively, characterizing it as one of the most constructive emotions."

Individual Barriers to Gratitude

Certain personality factors and other individual factors appear to act as barriers to gratitude.

Envy, materialism, narcissism, cynicism

Michael McCullough and colleagues found that dispositional gratitude was negatively associated with both materialism and envy (McCullough et al., 2002) [1798]. Because envy and materialism involve dwelling on what we do not have, they may be antithetical to gratitude, making it difficult for people to be grateful and envious at the same time. Indeed, when one study took a closer look at the negative relationship between materialism and life satisfaction, it found that the lower life satisfaction among materialistic people could be explained by the fact that they reported lower levels of gratitude (Tsang, Carpenter, Roberts, Frisch, & Carlisle, 2014) [52]. "High materialists are less happy in part because they find it harder to be grateful for what they have," write the researchers.

Narcissism may be another potent inhibitor of gratitude (McWilliams & Lependorf, 1990) [71]. In one experimental study, participants who scored higher on the Narcissistic Personality Inventory reported feeling less gratitude towards their partners than did less narcissistic people (Farwell & Wohlwend-Lloyd, 1998) [288].

A recent study of undergraduate students found that self-reported levels of narcissism—along with cynicism and materialism/envy—at the beginning of the study were significantly negatively associated with state gratitude levels two months later (after controlling for initial gratitude levels) (Solom, Watkins, McCurrach, & Scheibe, 2017) [7].

Why might narcissism have this negative association with gratitude? One possibility: “Individuals high in narcissism may not even notice that a gift has occurred because they believe they are entitled to the benefit,” write the researchers.

Headwinds/tailwinds asymmetry

Another phenomenon that may prevent people from feeling gratitude as often as they could is something called “headwind/tailwind asymmetry.”

A set of seven studies showed that people are more aware of the barriers they have faced (their so-called headwinds) than the benefits that they have enjoyed (their tailwinds) (Davidai & Gilovich, 2016) [0]. For example, this research found that both Democrats and Republicans believe the electoral map works against them, football fans take more notice of the challenging games on their team’s schedules than on rival teams’ schedules, and people more frequently recall episodes when they thought a sibling was treated better than when they themselves were treated better.

While it makes sense that people would be more cognitively aware of challenges they have had to overcome, this also means that they may discount the benefits and resources that have allowed good things to happen in their lives, and thus make them less likely to feel grateful for these benefits.



Social and Cultural Factors Linked to Gratitude

Social factors can also influence a person's tendency to experience gratitude. These factors include religion, cultural influences, and parenting styles.

Religion

As mentioned in the introduction, gratitude is an important component of many religious traditions, and a number of studies have investigated potential relationships between personal religiosity and gratitude, with varying results.

In one study, more grateful people reported higher intrinsic religiosity (engaging with religion for its own sake) and lower extrinsic religiosity (engaging with religion for other gains, such as improved social status) (Watkins et al., 2003) [628]. Other studies have found positive associations between gratitude and a number of religious attributes, including frequently engaging in religious practices, ascribing importance to religion, having a personal relationship with God, experiencing spiritual transcendence (Emmons & Kneezel, 2005) [118], and expressing religious commitment (Rosmarin, Pirutinsky, Cohen, Galler, & Krumrei, 2011) [49]. And a recent study that examined the relationship between religion and gratitude in people ages 17 to 24 found that religious efficacy ("experiencing an answer to one's prayers and/or a miracle from God") and having friends who are religious were positively associated with feelings of gratitude, whereas religious affiliation, private devotion,

participation in organized religion, otherworldly belief, religious salience (the importance of religion in one's daily life), and being spiritual but not religious were unrelated to feelings of gratitude (Kraus, Desmond, & Palmer, 2015) [7].

Christians reported significantly higher gratitude than atheists in one recent study (Morgan et al., 2017) [2]. However, there were some nuances: While Christians rated themselves higher in grateful emotions than atheists did, there was no difference between the two groups in attitudes toward gratitude (e.g. attitudes towards recognizing valuable benefits or evaluations of the importance of gratitude) or gratitude-related behaviors (e.g., expressing thanks to people or recognizing how many things they had to be thankful for).

Religion, gratitude, and mental health

Other studies have examined the relationships between religion, gratitude, and psychological well-being. For example, a longitudinal study of older U.S. adults found that: 1) prolonged financial difficulties were associated with depressive symptoms over time in less grateful older people, and 2) older adults who attended church more frequently and had stronger beliefs that God helps people overcome their difficulties showed

greater increases in gratitude over time (Krause, 2009) [78].

A later study found evidence that religious involvement was significantly positively associated with dispositional gratitude, regardless of whether someone generally experiences more positive or negative affect (Rothenberg, Pirutinsky, Greer, & Korbman, 2015) [4]. This study also found that religiousness was significantly associated with religious coping (using religion to deal with stress, such as by trying to see how God may be trying to teach a lesson or by praying), which was in turn significantly associated with increased gratitude.

These findings suggest that religion may help people maintain gratitude even in the face of emotional distress. Possible mechanisms for this include the social support inherent in religious involvement; the act of praying, which can stimulate gratitude; and the direct benefits that can come from religious coping strategies, such as seeing negative events as lessons or as opportunities to form a stronger connection to God.

Experimental studies of religion and gratitude

Other studies have sought to experimentally manipulate elements of religiosity to see if they could influence gratitude. One study found that people who were assigned to pray in general or specifically for their partner reported higher gratitude at the end of four weeks than did those assigned to think about daily activities or to think positive thoughts about their partner, suggesting that prayer may indeed increase feelings of gratitude (Lambert, Fincham, Braithwaite, Graham, & Beach, 2009) [96]. However, another study found that priming people to think about religion—by having them unscramble a sentence

filled with religious words such as “spirit,” “divine,” and “God”—did not cause them to feel more gratitude or to give more money to a partner in an economic game (Tsang, Schulwitz, & Carlisle, 2012) [48]. And, while there was a significant association between participants’ self-reported intrinsic religiousness and their trait gratitude, intrinsic religiousness was not associated with gratitude or gratitude expression in response to a specific favor.

Culture

Research from anthropology and sociology has found cultural variations in expressions of gratitude (Appadurai, 1985) [78] (Ide, 1998) [137], and a few studies suggest that people from different cultures may vary in their internal experiences of gratitude as well.

For example, as mentioned earlier, one study found differences in conceptualizations of gratitude between people in Germany and those in the United States: Men in the United States reported experiencing gratitude less frequently than German men, and one-third of the American men in the study reported a preference for hiding gratitude while none of the German men reported this preference (Sommers & Kosmitzki, 1988) [54].

Another study found that people in the United Kingdom more frequently reported that “gratitude is linked with various negative emotions including guilt, indebtedness, embarrassment, and awkwardness” than did people in the United States (Morgan, Gulliford, & Kristjánsson, 2014) [25]. According to the researchers, their findings suggest that “gratitude may contain a common core with culturally ubiquitous features, in addition to socially constructed

elements that change depending on the culture being studied.”

As mentioned in the “Origins of Gratitude” section, there is also evidence for cultural variation in the development of gratitude in children. For example, a study examining different types of gratitude in American, Brazilian, Chinese, and Russian children of different ages found that American children were most likely to express concrete gratitude (the desire to repay a gift or favor), regardless of age, whereas Russian children were the least likely. However, 11-to-14-year-old Russians were the most likely to express “connective gratitude” (taking into account the desires of the benefactor when repaying a gift or favor) overall (Tudge et al., 2016) [2]. “[T]he cultural variability that we found suggests that culture-wide sets of child-rearing values and beliefs have an influence on how children respond to being given something,” write the study’s authors. “If it is the case that culture-wide values influence children’s responses to help and gifts, it most likely that parents are one of the important mediating factors.”

Parenting

While cultural studies point to the importance of parenting in the development of gratitude, thus far only a few studies have examined how parents may influence their offspring’s gratitude.

A study of fourth and fifth grade students and their biological parents found a small but statistically significant relationship between the self-reported gratitude of the children and their mothers, but not between the children and their fathers (Hoy, Suldo, & Mendez, 2013) [36]. This study also found a small but significant association between a mother’s gratitude and her child’s

life satisfaction. However, because this study is purely correlational, it cannot tell us anything about the mechanisms underlying these associations or the extent to which nature versus nurture plays a role.

For the JTF-funded Raising Grateful Children project, Andrea Hussong and colleagues conducted focus groups of parents to determine how parents think about child gratitude, how they attempt to cultivate gratitude in their children, and what barriers prevent cultivating gratitude (Halberstadt et al., 2016) [5] (Hussong et al., 2017).

Based on this work, Hussong and her colleagues have postulated that the gratitude experience has four parts: noticing what we can be grateful for, thinking about why we have been given those things, feeling about what we have been given, and doing something to express appreciation for these actions (“notice-think-feel-do” in shorthand).

In their focus groups, Hussong and colleagues found that most parents (85 percent) encouraged their children to say “thank you” but fewer (only 39 percent) encouraged their children to experience gratitude in other ways. What is unknown is how these parenting choices end up influencing how children conceptualize and experience gratitude.

A recent study by Hussong’s group provides one possible mechanism for how parents can instill gratitude in their children (Rothenberg et al., 2017) [2]. This study of parents who had children between the ages of six and nine found that parents with high dispositional gratitude were more likely to have a goal of trying to socialize gratitude in their children. They also more frequently reported placing their children

in activities that were likely to evoke gratitude, such as having them participate in a volunteer opportunity for people in need, and participation in such activities was associated with more frequent gratitude expression by the children.

Because this study was predicated on the parents' self-reports and observations of their

children, it's possible that more grateful parents are more likely to observe gratitude in their children because they are more attuned to it—but this study may also suggest that parents can succeed in attempts to socialize their children to be more grateful.



Individual Benefits Associated with Gratitude

Gratitude is associated with many benefits for individuals, including better physical and psychological health, greater happiness and life satisfaction, less materialism, and more.

Physical Health

While still a new avenue of research, a growing number of studies suggest that gratitude may make people physically healthier and adopt healthier lifestyles.

Evidence that a grateful disposition is associated with better health

In a 2010 review, Wood, Froh, and Geraghty wrote, “Almost no studies have been conducted into gratitude and physical health, and this remains a key understudied area of research,” (Wood, Froh, & Geraghty, 2010) [673].

But the studies that do exist, mainly published since that review, suggest there may be a connection. A 1995 study found that when participants felt appreciation, an emotion related to gratitude, their heart rate variability, an indicator of good heart health, improved (McCraty, Atkinson, & Tiller, 1995) [2]. Other studies have found that more grateful people: report better physical health (Krause & Hayward, 2014) [1] (Hill, Allemand, & Roberts, 2013) [37], are moderately more likely to report engaging in healthy activities (Hill et al., 2013) [37], are more willing to seek help for health concerns (Hill et al., 2013) [37], and sleep better and longer (Mills et al., 2015) [31] (M.-Y. Ng & Wong, 2013) [18] (Wood, Joseph, Lloyd, & Atkins, 2009) [162].

There has been a burgeoning interest, thanks in large part to JTF funding (through the Expanding the Science and Practice of Gratitude project), in exploring how gratitude may be particularly helpful for people who have suffered from, or are at risk for, some form of heart failure. A study of people with heart failure found that people with higher dispositional gratitude reported better sleep, less fatigue, and lower levels of cellular inflammation (Mills et al., 2015) [31], and a study of patients who had had a heart attack or chest pain found that patients who had higher levels of optimism and gratitude two weeks after their cardiac event also reported greater improvements in emotional well-being six months later (Millstein et al., 2016) [1].

A longitudinal study called the Gratitude Research in Acute Coronary Events (GRACE) study found that higher levels of trait gratitude and optimism were associated with biomarkers indicating less inflammation and improved blood vessel function two weeks, though not six months, after patients were hospitalized for chest pain or a heart attack (Celano et al., 2016) [2]. While a patient’s optimism was associated with greater physical activity six months after hospitalization and reduced rates of being readmitted to the hospital for heart problems, patients’ gratitude was not associated with their physical

activity level or hospital readmissions during this period (Huffman et al., 2016) [17]. However, both optimism and gratitude were associated with higher self-reported adherence to medical recommendations, suggesting that gratitude may help patients better recover from heart attacks and other serious heart problems by encouraging them to follow their doctors' instructions (Millstein et al., 2016) [1].

A few studies have explored whether gratitude may be linked to benefits for patients with various other chronic medical conditions. In one study, chronic pain patients with higher trait gratitude reported lower depression and anxiety and better sleep (M.-Y. Ng & Wong, 2013) [18]. A longitudinal study of patients with one of two chronic illnesses—arthritis or inflammatory bowel disease—found that patients with high trait gratitude at the beginning of the study also had fewer symptoms of depression; that was still the case six months later (Sirois & Wood, 2016) [4].

Finally, a recent preliminary study suggests that gratitude might help prevent chronic illness. This study found an association between stronger feelings of gratitude and lower levels of hemoglobin HbA1c, a biomarker involved in blood sugar control. High levels of HbA1c have been associated with chronic kidney disease, a number of cancers, and diabetes (Krause et al., 2017) [0].

Evidence that gratitude interventions may improve physical health

Can interventions designed to increase gratitude also improve health and healthy habits? Emmons and McCullough found that undergraduate participants who were randomly assigned to write down five things they were grateful for (known as the “counting blessings”

practice, or “gratitude journaling”) weekly for 10 weeks reported spending significantly more time exercising and had fewer physical complaints than did participants who were assigned to write down either five hassles or five daily events (Emmons & McCullough, 2003) [2376]. However, a second trial in which college students were asked to count their blessings daily for 14 days did not find differences in physical symptoms or time spent exercising, and a study of middle school students found that those who completed a similar “counting blessings” activity for two weeks did not report having fewer negative physical health symptoms than did those who wrote about their hassles or those in a control group who didn't perform any activity (Froh, Sefick, & Emmons, 2008) [580], possibly suggesting that a two-week window is too short to see such changes.

A handful of studies have found evidence that gratitude exercises may be able to improve sleep. While the study that asked college students to keep a gratitude journal for two weeks did not see improvements in their sleep, a study of people with neuromuscular disease found that those who kept a daily gratitude journal for 21 days reported sleeping significantly longer at night and felt significantly more refreshed upon waking than people who were assigned to a control condition that involved filling out daily surveys (though there were not differences between the groups in other physical health symptoms or health behaviors) (Emmons & McCullough, 2003) [2376]. And a larger study that assigned young women to keep a gratitude journal, write about daily events, or to a no-activity control group found that the women who kept a gratitude journal for two weeks reported a small but significant improvement in their daily

sleep quality compared to the people in the other two groups (Jackowska, Brown, Ronaldson, & Steptoe, 2016)[15].

A study of heart failure patients who were randomly assigned either to write about things for which they were grateful each day for eight weeks or to a control group that did not do this intervention found that patients in the gratitude group reported improved trait gratitude and reduced biomarkers of inflammation (Redwine et al., 2016) [7]. Patients in the gratitude group also showed more parasympathetic heart rate variability—a sign of improving heart health—during a one-time gratitude journal activity that both groups performed after the eight weeks, though there was no difference in general resting heart rate variability between the two groups after the eight week intervention. This suggests that a gratitude journal might be a good addition to the care provided to heart patients, although larger randomized control trials will be needed to determine whether gratitude journaling—or other gratitude interventions—can lead to lasting physiological and/or psychological changes in cardiac patients.

Well-being

Many more studies have examined possible connections between gratitude and various elements of well-being.

Evidence that a grateful disposition is associated with life satisfaction, optimism, subjective well-being, positive affect, and happiness

People with higher dispositional gratitude report having higher levels of several elements of psychological well-being, including more life satisfaction (McCullough et al., 2002) [1798]

(Watkins et al., 2003) [628] (Peterson, Ruch, Beermann, Park, & Seligman, 2007) [480] (Wood, Joseph, & Maltby, 2008) [243] (Froh, Yurkewicz, et al., 2009) [331] (Wood, Joseph, & Maltby, 2009) [268] (Hill & Allemand, 2011) [55] (Sun & Kong, 2013) [23] (Kong et al., 2015) [41], happiness (McCullough et al., 2002) [1798] (Watkins et al., 2003) [628], optimism (McCullough et al., 2002) [1798] (Froh, Yurkewicz, et al., 2009) [331] (Hill & Allemand, 2011) [55], hope (McCullough et al., 2002) [1798], and positive affect (mood) (McCullough et al., 2002) [1798] (Watkins et al., 2003) [628] (Froh, Yurkewicz, et al., 2009) [331] (Hill & Allemand, 2011) [55] (Sun & Kong, 2013) [23].

Daily feelings of gratitude are also associated with elements of well-being. A daily diary study found positive relationships between daily feelings of gratitude and feelings of both hedonic (related to pleasure) and eudaimonic (related to meaning and self-realization) well-being (Nezlek, Newman, & Thrash, 2017) [1]. Additionally, feelings of gratitude during one day were positively associated with hedonic well-being (though not to eudaimonic well-being) the next day.

Some studies have found associations between specific types of gratitude and well-being. In one study, university students who reported more “higher-order gratitude” (which includes thanking others, thanking God, cherishing blessings, appreciating hardships, and cherishing the moment) also reported more life satisfaction and positive affect, even after controlling for their gender, age, religion, personality traits, and dispositional gratitude (Lin, 2014) [17]. Another study found that subjective well-being increased linearly with the number of components of gratitude on which a person scored highly—including

ing their understanding of when gratitude is due, their grateful emotions, attitudes towards gratitude, and gratitude-related behaviors—suggesting that there may be multiple facets of gratitude that can lead to increased happiness (Morgan et al., 2017) [2].

When it comes to gratitude's relationship with life satisfaction, there may be cultural differences. A study of 12,439 U.S. and 445 Swiss adults that looked at links between various character strengths and life satisfaction found that gratitude—along with zest, hope, and love— was one of the strongest and most direct predictors of life satisfaction among adults in the U.S. but was lower on the list for Swiss adults (perseverance was the most robust predictor of life satisfaction among the Swiss) (Peterson et al., 2007) [480].

Evidence that a grateful disposition may counteract materialism

It stands to reason that gratitude, with its inherent focus on people and things outside the self, may make people less prone to materialism, and a few studies have found that people with more grateful dispositions are less materialistic (Polak & McCullough, 2006) [149] (Diessner & Lewis, 2007) [32]. In one study, the relationship between gratitude and materialism could be explained by people's levels of life satisfaction: Grateful people may be less materialistic because they feel more satisfied with their lives—and thus, ostensibly, don't feel much of a need to acquire new things in order to feel more satisfied. Indeed, an experiment where participants were induced to feel more gratitude led to higher feelings of life satisfaction and lower materialism (Lambert, Fincham, Stillman, & Dean, 2009) [117].

Another study found that more materialistic undergraduate students reported less life satisfaction, which could be explained by their lower levels of gratitude (Tsang et al., 2014) [52], while a follow-up study found that more materialistic people who were also very grateful did not show lower life satisfaction, suggesting that gratitude may be able to buffer the otherwise negative relationship between materialism and life satisfaction (Roberts, Tsang, & Manolis, 2015) [7].

Evidence that a grateful disposition may protect against burnout

Dispositional gratitude may help protect people from various forms of burnout. One small study of school teachers found that more dispositional gratitude was associated with less evidence of burnout (Chan, 2011) [54], while a study of mental health professionals found that workplace-specific gratitude—how grateful employees reported feeling for their coworkers, supervisors, clients, and job—was negatively associated with burnout (Lanham, Michelle, Rye, Mark, Rimsky, Liza, & Weill, 2012) [42].

Athletes with higher dispositional gratitude and higher gratitude related to playing their sport report feeling less burned out with their sport (L. H. Chen & Kee, 2008) [95] (Gabana, Steinfeldt, Wong, & Chung, 2017) [0] (L. H. Chen & Chang, 2016) [0]. However, a longitudinal study of athletes found that more dispositional gratitude at the beginning of the study did not predict less burnout three months later. There was, however, a reverse relationship: Athletes reporting more burnout at the beginning of the study reported less gratitude three months later (L. H. Chen & Chang, 2014) [4].

Together, these results suggest that gratitude may help protect employees and athletes from burnout, but when burnout does occur it may dampen gratitude. Future studies will be needed to fully tease apart the nuances of the relationship between gratitude and burnout.

Evidence that gratitude interventions may increase well-being

Since evidence links gratitude to a host of psychological benefits, it stands to reason that activities encouraging people to feel more grateful might produce similar benefits. Many studies have explored this possibility.

Emmons and McCullough's 2003 randomized trial of their "counting blessings" intervention found that people who wrote about their blessings weekly for 10 weeks reported feeling more optimistic about the following week; they also felt better about their overall lives than did participants who wrote about daily hassles or ordinary events in their lives, although there were not differences between groups in their general positive or negative mood (Emmons & McCullough, 2003) [2376]. A second trial found that participants who counted their blessings daily for 14 days reported higher levels of positive affect and were more likely to report helping someone.

Other studies have found that variations of the "counting blessings" intervention improved people's life satisfaction and self-esteem (Rash, Matsuba, & Prkachin, 2011) [86]; alleviated symptoms of depression and boosted positive affect, though only in participants who had high depressive symptoms to begin with (Harbaugh & Vasey, 2014) [17]; increased optimism and happiness (Jackowska et al., 2016) [15]; decreased

body dissatisfaction in women (Homan, Sedlak, & Boyd, 2014) [7]; and increased the trust and positive emotions felt during an economic transaction (Drażkowski, Kaczmarek, & Kashdan, 2017) [0].

People who completed a "Three Good Things" variation of the counting blessings intervention, in which they wrote down three things that went well and identified the causes of those good things, reported increased happiness six months after the week-long intervention (Seligman, Steen, Park, & Peterson, 2005) [418]. Other studies of the Three Good Things activity have found that participants who tried it reported enhanced subjective well-being and better access to positive memories (Watkins, Uher, & Pichinevskiy, 2015) [33], as well as reduced stress and a greater sense of flourishing in life (Killen & Macaskill, 2015) [25].

But not all studies have found such positive results from gratitude journaling. A relatively small study comparing the effectiveness of counting blessings with an intervention that asked people to visualize their best possible selves, along with a control activity in which people wrote about details of their day, found that completing any of the activities (even the control activity) immediately reduced negative affect in the participants, but only the "best possible selves" visualization immediately increased positive affect (Sheldon & Lyubomirsky, 2006) [706]. In their paper, the researchers suggest that participants may have found the gratitude activity more challenging and less enjoyable than imagining their future.

Interestingly, another study found that students who counted blessings once a week reported greater improvements in well-being than those who counted blessings three days

a week (Lyubomirsky, Sheldon, & Schkade, 2005) [2482]. In fact, the students who counted blessings three times a week actually experienced a decrease in their well-being (as did those in the no-intervention control group). This was a single study, but it may suggest that counting blessings less frequently may make the activity more meaningful and sustainable over the long-term—perhaps because, as the researchers speculate, one becomes numb to the novelty and benefits of counting one’s blessings if it’s performed more frequently.

A handful of studies have focused on the impact of writing and delivering letters of gratitude on happiness and well-being, particularly letters addressed to people from whom one has received a gift of some kind but whom one has never properly thanked. In one study, people who were asked to write a gratitude letter once a week for three weeks were significantly happier, less depressed, and more satisfied with their lives at the end of the intervention (Toepfer, Cichy, & Peters, 2012) [98]. In another study, participants who were assigned to write a gratitude letter that they were told would be sent to the person they were thanking reported increased positive affect and decreased negative affect, but these effects were not as large as they were for people who were assigned to think about or write an essay about someone for whom they were grateful. The researchers speculate that an element of social anxiety may have dampened the effect of the gratitude letters (Watkins et al., 2003) [628].

In contrast, another study, led by psychologist Martin Seligman, found that participants who wrote a letter of gratitude—and read it in person to their benefactor (the “gratitude visit”)—showed significantly greater happiness

and decreased symptoms of depression one month later (Seligman et al., 2005) [418]. However, it’s important to note that the subjects in this study were recruited from Seligman’s website for his book *Authentic Happiness* and were told that they were participating in a study intended to increase participants’ well-being. This process for recruiting participants may have led to self-selection effects, which could help explain why the results reported in this study were stronger than those from other studies.

In fact, another study found that participants who signed up to be in a happiness intervention and were assigned to one of the positive interventions (one intervention was writing a gratitude letter) enjoyed larger boosts in happiness both immediately following the intervention and six months later than did people who completed the same positive interventions after being told they were signing up for a study involving cognitive exercises (Lyubomirsky, Dickerhoof, Boehm, & Sheldon, 2011) [427].

Potential mechanisms for how gratitude supports well-being

There are several potential mechanisms for how gratitude may positively influence a person’s happiness or psychological well-being, some of which are presented below.

- *Preventing hedonic adaptation*

One possible explanation is that gratitude counteracts hedonic adaptation—when people acclimate to positive developments in their lives and thus do not enjoy them as much—by encouraging people to deliberately focus on what is good in their lives rather than take them for granted. “Gratitude promotes the savoring of positive life

experiences and situations so that maximum satisfaction and enjoyment are distilled from one's circumstances," suggest psychologists Sonja Lyubomirsky, Kennon Sheldon, and David Schkade in a paper. "This practice may directly counteract the effects of hedonic adaptation by helping people extract as much appreciation from the good things in their lives as possible" (Lyubomirsky et al., 2005) [2482].

- *Gratitude may "broaden and build"*

Another possibility is that gratitude adheres to Barbara Fredrickson's "broaden and build" theory of positive emotions (Fredrickson, 2004) [1632]. This theory posits that positive emotions can broaden a person's array of thoughts and actions—for example, joy encourages people to play, push their limits, and be creative—and also build a person's psychological and social resources on which they can rely in difficult times.

"Gratitude appears to broaden people's modes of thinking as they creatively consider a wide array of actions that might benefit others," writes Fredrickson. "Although grateful individuals most typically act prosocially simply to express their gratitude, over time the actions inspired by gratitude build and strengthen social bonds and friendships" (Fredrickson, 2004) [492].

A study of people's coping styles may support the idea that gratitude "broadens and builds" similarly to other positive emotions. This study found positive associations between trait gratitude and a number of positive strategies for coping with challenges—such as seeking support, reinterpreting situations through a positive lens, and engaging in problem-solving—and negative associations between gratitude and negative coping strategies such as substance use,

denial, and self-blame (Wood, Joseph, & Linley, 2007) [255].

- *Canceling out the negative*

Yet another way that a positive emotion such as gratitude can build one's coping capacity is through undoing the effects of negative emotions. Gratitude may combat the negative emotional processes that underpin unhappiness, burnout, and many psychological disorders—as research has indicated that "within momentary experience, positive emotions are incompatible with negative emotions" and that positive emotions can lessen the attention one pays to negative information (Garland et al., 2010) [505]. A set of eight studies found evidence that gratitude is negatively associated with symptoms of depression; further analysis attributed this relationship to the fact that when people experience gratitude, they recast negative experiences in a more positive light and experience more positive emotion, both of which reduce the pain of negative emotions (Lambert, Fincham, & Stillman, 2012) [94].

- *Motivating self-improvement*

However, a recent paper provides theoretical and experimental evidence that gratitude may lead to improved well-being in part by inducing negative emotions. This paper suggests that expressing gratitude motivates people to put effort into a range of positive behaviors (e.g., exercising more, helping others, building relationships) that lead to self-improvement, and it does this by inducing positive emotions—elevation, humility, connectedness—as well as negative ones—indebtedness, guilt, and discomfort (Armenta, Fritz, & Lyubomirsky, 2017) [7]. "We argue that

the negative emotions elicited by gratitude may motivate individuals to try to improve themselves in order to reduce those negative feelings,” write the researchers.

- *Increasing self-esteem*

Another study found evidence that trait gratitude may have positive effects on well-being partially via its ability to increase self-esteem (Lin, 2015) [9]. When a person feels grateful they often view themselves as benefiting from another person’s generosity, leading them to feel valued. This increases self-esteem, which in turn leads to higher levels of psychological well-being.

- *Helping people meet their basic psychological needs*

A longitudinal study found that gratitude was associated with relatedness and autonomy—two of the three basic psychological needs—over time and that all three psychological needs (relatedness, autonomy, and competence) predicted gratitude over time, suggesting that there “exists a dual upward spiral between gratitude and specific basic psychological needs” (Lee, Tong, & Sim, 2015)[3].

Benefits for People with Psychological Challenges

Given the many physical, mental, and emotional benefits associated with gratitude, there is a growing concentration of studies focused on how gratitude may help people with various psychological challenges.

Evidence that gratitude may benefit people in drug and alcohol recovery

A few recent studies have explored whether gratitude may help people recover from substance misuse. For example, in one study, people in a drug rehabilitation center who had greater trait gratitude also displayed stronger coping strategies that helped them deal with stresses and challenges, which, in turn, was associated with lower drug use (Leung & Tong, 2017) [0]. What might explain that link? A theoretical paper suggests that gratitude can act as a form of “recovery capital” that enables people to initiate and sustain their recovery by helping them build up their internal and external support resources, noting that the Narcotics Anonymous program encourages the practice of gratitude as an important element of recovery (G. Chen, 2016) [1].

However, a study of people who had entered abstinence-based alcohol-use-disorder treatment found that the relationship between gratitude and abstinence was nuanced (Krentzman, 2017) [0]. While there was a positive association between gratitude and future sobriety in people who were sober following treatment, the association between gratitude and future abstinence was negative for people who were drinking frequently following treatment. This could suggest that “high levels of gratitude might obscure life problems, such as risky or harmful levels or drinking, which might best be brought to light,” write the authors.

Evidence that gratitude may benefit people with mental illness

Several studies have examined associations between gratitude and mental illness symptoms

and have tested whether gratitude interventions can lessen the severity of these symptoms.

Multiple studies have found that people with higher levels of dispositional gratitude have signs of better psychological health, including higher levels of perceived social support and lower levels of stress, depression, and anxiety (Wood, Maltby, Gillett, Linley, & Joseph, 2008) [395] (Froh, Emmons, et al., 2011) [180] (Petrocchi & Couyoumdjian, 2016) [7] (Disabato, Kashdan, Short, & Jarden, 2017) [8].

People with higher dispositional gratitude also report having fewer suicidal thoughts and attempts (Kleiman, Adams, Kashdan, & Riskind, 2013) [94], while a recent study found that brooding increased suicidal ideation by negatively impacting gratitude (White et al., 2017) [0]. In another study, students with higher gratitude had higher self-esteem, which itself was also associated with lower suicidal ideation and fewer suicide attempts; however, the extent to which increased self-esteem could explain the relationship between gratitude and lower suicidality was stronger in adolescents who had experienced fewer stressful life events. This suggests that “gratitude, like other personal attributes, may not be sufficient to protect adolescents from maladaptation in the face of serious stress” (Li, Zhang, Li, Li, & Ye, 2012) [78].

Several studies have tested whether gratitude practices can improve mental health. Studies have found that the Three Good Things activity (Seligman et al., 2005) [418], keeping a gratitude journal (Kerr, O’Donovan, & Pepping, 2014) [31], and writing gratitude letters (Toepfer et al., 2012) [98] (Wong et al., 2016) [5] can improve symptoms of mental health (such as decreased depression and anxiety and increased life satis-

faction and optimism), although the strength and length of these effects varies across studies, and, in one study, depended in part on personality (more extraverted participants had greater decreases in depression) (Senf & Liao, 2013) [68].

An innovative recent study that asked participants about their emotional state immediately after completing various gratitude exercises found that people felt both uplifted and indebted (Layous, Sweeny, et al., 2017) [2]. The researchers note that this may have relevance for the future development of gratitude interventions for depression, as depressed individuals may be more sensitive to feelings of indebtedness and guilt, and thus gratitude interventions that elicit these feelings could potentially backfire in some people.

There is some question as to whether gratitude interventions can benefit people who have been in treatment for suicidal thoughts or attempts. In one study, participants who were admitted to a psychiatric unit for suicidal ideation or behavior completed one of nine different positive psychology exercises daily, including writing a gratitude letter and counting blessings (Huffman et al., 2014) [66]. Writing the gratitude letter, along with most of the other exercises, was associated with significantly improved optimism and decreased hopelessness, and writing the gratitude letter was associated with the largest change.

However, another study of adults with major depressive disorder who had had suicidal thoughts or had attempted suicide and were being discharged from in-patient psychiatric units found, to the surprise of the researchers, that a positive psychology intervention that involved six different positive psychology exercises, including counting blessings and writing a gratitude letter, was not as effective in improv-

ing depression and suicidal ideation as a cognition-focused intervention that involved different memory activities, such as recalling routine events or interactions with others (Celano et al., 2017) [1]. Importantly, this study did not include a no-intervention control group, and there was a lower completion rate in the positive psychology group, suggesting that these patients may have found those activities more difficult than the cognitive-focused activities.

Overall, these results suggest that gratitude interventions may be useful for people with depression and suicidal ideation, although further study is needed to determine which interventions perform better than standard therapies and which patients are most likely to benefit from these interventions.

Evidence that gratitude may benefit trauma survivors

Studies have found evidence that more grateful people may be more resilient following traumatic events: Vietnam veterans (Kashdan, Uswatte, & Julian, 2006) [247], undergraduates with traumatic histories (Vernon, Dillon, & Steiner, 2009) [71] (Vernon, 2012) [13] (Van Dusen, Tiamiyu, Kashdan, & Elhai, 2015) [5], and adolescents who lived in a city that had been under missile attack (Israel-Cohen, Uzefovsky, Kashy-Rosenbaum, & Kaplan, 2015) [13] with higher dispositional gratitude reported less severe symptoms of PTSD.

Gratitude may also lead to more positive psychological changes following a traumatic experience, what researchers call “post-traumatic growth.” Breast cancer patients with higher levels of trait gratitude reported more post-traumatic growth following their experience with cancer

as well as reduced distress and more positive emotions, than did patients with lower gratitude (Ruini & Vescovelli, 2013) [68]. A study of survivors of a campus shooting found that people with high trait gratitude four months following the shooting showed a stronger relationship between post-traumatic stress and post-traumatic growth, suggesting that very grateful people may be better able to convert stressful situations into opportunities for growth (Vieselmeier, Holguin, & Mezulis, 2017) [5]. Studies of survivors of natural disasters, including earthquakes and volcanic eruptions, have also found associations between gratitude and post-traumatic growth (Lies, Mellor, & Hong, 2014) [7] (Subandi, Achmad, Kurniati, & Febri, 2014) [11] (Zhou & Wu, 2016) [4].

Other studies have examined whether gratitude interventions can help people deal with traumatic experiences. One study found that grateful reappraisal of unpleasant memories—considering the positive consequences that have occurred due to a negative event—could help bring people emotional closure regarding these events (Watkins, Cruz, Holben, & Kolts, 2008) [64], and another study found that writing gratitude letters decreased the fear of death experienced by breast cancer survivors (Otto, Szczeny, Soriano, Laurenceau, & Siegel, 2016) [5].

Taken together, there is accumulating evidence that gratitude activities may be useful in various therapeutic contexts (for commentaries see (C. Nelson, 2009) [60] (Sansone & Sansone, 2010) [56] (Emmons & Stern, 2013) [68]). Generally speaking, these exercises are relatively easy to implement and are well-tolerated by most people, although additional randomized control trials are needed to deter-

mine the true efficacy of different types of gratitude practices on different populations.

Cultivating Other Virtues

A handful of studies suggest that gratitude may be associated with other virtues, including patience, humility, and wisdom.

Patience

One study asked participants to make a series of choices between receiving smaller amounts of cash immediately and larger amounts one week to six months later. Participants with higher trait gratitude were more likely to wait and take the larger amounts, suggesting that gratitude may reduce impatience (DeSteno, Li, Dickens, & Lerner, 2014) [41]. In a more recent study, participants' daily levels of gratitude were significantly associated with patience in a similar money task, and when the researchers induced more gratitude in the participants, their patience also increased (Dickens & DeSteno, 2016) [5].

Humility

One study found that people who wrote letters expressing gratitude to a significant person in their life displayed more humility than did those who completed a different activity that didn't foster gratitude; participants' state humility at the start of the study predicted how much gratitude they felt after writing the letters. In the same study, participants were instructed to keep a diary for two weeks. When the researchers reviewed their entries for expressions of gratitude and humility (among other traits), they found that "humility and gratitude mutually predicted one another," suggesting that feelings of grati-

tude may lead to increased feelings of humility and vice versa, causing an "upward spiral" of both of these virtues (Kruse, Chancellor, Ruberton, & Lyubomirsky, 2014) [35].

In another study, participants with higher intellectual humility were inclined toward having more prosocial attitudes, and both higher gratitude and empathy could account for this relationship (Krumrei-Mancuso, 2017) [3]. This research—and gratitude's understood role in shifting focus from the self to other people—suggests that activities that boost gratitude in individuals might increase their humility as well (Ruberton, Kruse, & Lyubomirsky, 2016) [3].

Wisdom

A study found that people who were nominated via others as being particularly wise expressed more feelings of gratitude in interviews with researchers than people who weren't singled out by others for their wisdom; what's more, wisdom was positively correlated with four measures of gratitude (simple appreciation, sense of abundance, frequency of gratitude, appreciation of others) in surveys of undergraduate students (König & Glück, 2014) [16].

All of these lines of research suggest that gratitude is intertwined with several other important virtues, and perhaps even that by boosting gratitude in individuals, we can foster these other virtues as well.

Benefits to Children and Adolescents

Several studies have investigated how gratitude influences the lives and success of children and adolescents.

Evidence that a grateful disposition is associated with positive outcomes for children and adolescents

Gratitude may have wide-ranging positive effects for children and adolescents. Studies have found that more grateful adolescents and college students are more interested in school, perform better academically, have better interpersonal relationships, and are happier with their school experience (M. Ma, Kibler, & Sly, 2013) [16] (Tian, Pi, Huebner, & Du, 2016) [2](Mofidi, El-Alayli, & Brown, 2014) [4](Sun, Jiang, Chu, & Qian, 2014) [10](Froh, Bono, & Emmons, 2010) [167] (Froh, Emmons, et al., 2011) [180].

Gratitude may also make adolescents more prosocial. A new study led by Giacomo Bono, conducted as part of the ESPG's Youth Gratitude Project, tracked adolescents for four years (from ages 10-14 to 14-18) and examined the relationship between gratitude and the development of prosocial behavior (Bono et al., 2017) [0]. It found that growth in gratitude predicted increased prosocial behavior, and this relationship was reciprocal: Increases in prosocial behavior also predicted increases in gratitude.

Another recent longitudinal study found a small but significant relationship between gratitude and a sense of purpose, suggesting that gratitude may play a role in developing purpose as well (Malin, Liauw, & Damon, 2017) [1].

Evidence that gratitude interventions can benefit children and adolescents

A handful of studies have investigated how gratitude interventions may benefit children and adolescents.

For example, a few studies have examined how "counting blessings" can help students of

different ages. Middle school students assigned to count blessings each school day for two weeks showed decreased negative affect and increased gratitude, optimism, life satisfaction, and satisfaction with school (Froh et al., 2008) [580]. A different study that assigned seven- to 11-year-old students to "write down 2 or 3 things that you are thankful and grateful for today at school" found that these students reported experiencing more gratitude and felt more like they belonged in their school than students assigned to write about neutral topics; the benefits were strongest for male students (Diebel, Woodcock, Cooper, & Brignell, 2016) [2]. Another study found that eight- to 19-year-old students who wrote a gratitude letter and read it to the person for whom they were grateful reported more gratitude and positive affect after the intervention and more positive affect two months later than students assigned to journal about their day, but only students who had low positive affect at the beginning of the study saw these positive outcomes (Froh, Kashdan, Ozimkowski, & Miller, 2009) [268].

Another type of gratitude intervention, called "benefit appraisal," teaches students to think gratefully by prompting them to focus on the benefits of gifts given to them by others, as well as the gift givers' intentions and the costs they've incurred in giving the gift. In one study, elementary school students who received benefit-appraisal lessons for one week reported a more grateful mood and scored higher on a measure of grateful thinking than students who had completed similarly structured lessons focused on emotionally neutral topics (Froh et al., 2014) [65]. Additionally, students in the benefit-appraisal group wrote more thank you notes to members of their school's PTA than did

students in the control group, suggesting that this intervention encouraged them to increase their expressions of gratitude as well. Other students who received the benefit-appraisal intervention weekly for five weeks reported increased gratitude five months later and had increased positive affect, while the gratitude and positive mood of the students in the control group remained stable. Similarly, 11- to 14-year-old students attending two schools in North India who received benefit-appraisal lessons for five weeks reported higher levels of well-being, positive affect, life satisfaction, and gratitude than did students in a control group (Khanna & Singh, 2016) [4], again suggesting that this gratitude intervention may lead to a wide range of benefits.

However, in a 2014 commentary, Kristin Layous and Sonja Lyubomirsky suggest that the benefit-appraisal curriculum probably would not work as well with younger children who lack a

developed theory of mind and thus would have difficulty appraising the benefactor's intentions and emotions (Layous & Lyubomirsky, 2014) [20]. They also present ways these lessons could backfire (i.e., unintentionally encouraging students to express gratitude to avoid punishment rather than out of an intrinsic source of motivation). But Layous and Lyubomirsky suggest a way to combat this potential outcome: "intrinsic motivation can still be fostered even within the confines of externally regulated behavior (e.g., obligatory expressions of gratitude) if the activity fosters the psychological needs of competence (i.e., feeling skilled at a task), connectedness (i.e., feeling connected to others), and autonomy (i.e., feeling in control of one's choices)." If the design of the gratitude intervention meets these basic psychological needs, they argue, students may be less likely to see it as a chore and more likely to benefit from it (and it enjoy it, too).



Social Benefits Associated to Gratitude

While gratitude has been linked to many benefits for individuals' physical and mental health, perhaps its greatest value comes in social situations—no surprise for a virtue that sociologist Georg Simmel called “the moral memory of mankind.” Research suggests that gratitude inspires people to be more generous and prosocial; strengthens relationships, including romantic relationships; and may improve the climate in workplaces.

Prosocial Behavior

In a 2001 paper, McCullough and colleagues suggest that gratitude, like guilt and empathy, can be classified as a “moral affect” (or emotion) that motivates our behavior toward others. They posit that gratitude: 1) serves as a moral barometer, allowing people to recognize when they have benefited from other people's moral actions; 2) acts as a moral motivator by inspiring people to behave morally (prosocially) toward the person to whom they feel grateful, as well as toward other people; and 3) when expressed, it reinforces moral behavior by encouraging benefactors to be generous again in the future (McCullough et al., 2001) [1134].

Since 2001, many studies have found a connection between gratitude and prosocial behavior, which can be defined as a voluntary act performed to benefit another person or society. Examples of prosocial behavior can include everyday behaviors such as sharing food or holding the door open for a stranger; citizenship activities such as voting, volunteering, or donating to charity; and broader concepts such as empathy, respect, and forgiveness.

Does gratitude relate to prosocial behavior?

Some research suggests that people with higher dispositional gratitude are more prosocial. For example, McCullough, Emmons, and Tsang found that more grateful people performed more prosocial acts (as reported by people who knew the participants) (McCullough et al., 2002) [1798]. In addition, a study of college students found that more grateful participants were more likely to engage in “upstream reciprocity”—helping an unrelated third person after someone had helped them. Finally, a series of laboratory experiments found that people with higher trait gratitude gave more money when prompted to donate to a charity and were more generous and trusting in a money exchange game played with other participants online, again suggesting that more grateful people are more prosocial (Yost-Dubrow & Dunham, 2017) [0].

A recent meta-analytic review combined data from 65 papers (a total of 91 studies with 18,342 participants) to test the strength of association between gratitude and prosocial behavior (L. K. Ma, Tunney, & Ferguson, 2017) [3]. The researchers determined that there was a statistically

significant, medium-sized positive link between being grateful and being prosocial. The association was larger in certain scenarios. For example, studies that examined experiencing gratitude as a current emotion or mood rather than as an overall personality trait found, in general, greater associations with prosocial behavior, as did studies that directly induced feelings of gratitude experimentally, rather than those based on people recalling times when they felt grateful.

Do gratitude interventions increase prosocial behavior?

Other studies have investigated how gratitude practices influence prosocial behavior. For example, Emmons and McCullough found that participants who counted blessings each day for two weeks were more likely to have offered emotional support to someone else during the two weeks of the study than were participants who wrote about hassles in their lives or who compared their lives with the lives of others (Emmons & McCullough, 2003) [2376].

In another recent study, participants wrote a general letter of thanks to someone, a gratitude letter thanking a person for a specific kind act, or wrote about what they did last week; the people who wrote the gratitude letters expended more effort when asked to perform kind acts one day each week for three weeks (Layous, Nelson, Kurtz, & Lyubomirsky, 2017) [8]. A second experiment that asked participants to do kind acts for six weeks did not find that the people who wrote gratitude letters expended more effort on the kind acts than those in the control writing group. However, there was evidence of an indirect effect: The gratitude interventions increased feelings of elevation—the uplifting

emotion we feel when witnessing someone doing something morally good or kind—more than the control condition, and feelings of elevation were associated with increased prosocial behavior. Although this study has several limitations—among them, many of the results were barely above the threshold of significance—these findings suggest that gratitude may help put people in an elevated state, a state that has been linked to helping others and happiness.

Does inducing gratitude experimentally in specific situations increase prosocial behavior?

Studies have used various methods to investigate whether and how inducing people to feel gratitude in a particular situation might induce prosocial behavior. In one such study, some participants were led to believe that another participant—who was actually a “confederate” working with the researchers—had helped them with a computer problem (Bartlett & DeSteno, 2006) [738]. These participants spent significantly longer helping the confederate with another task than did participants who were not originally helped by the confederate. In a similar second experiment, people in the gratitude condition spent more time than other participants helping out a stranger who asked for help—although not as much time as the grateful participants spent helping the confederate in the previous experiment—suggesting that they were not acting generously only because they felt compelled to repay the confederate but perhaps because experiencing gratitude made them feel more prosocial in general. Interestingly, a third experiment found that making people think about the source of their gratitude (the confederate) reduced the time

they spent helping the stranger, suggesting that the prosocial impulse that springs from feelings of gratitude can be dampened.

Another study that induced gratitude in a similar way found that participants in the gratitude condition behaved more cooperatively and less selfishly than people who had not been made to feel gratitude, and, unlike in the previous study, they helped the stranger as much as they helped the confederate (DeSteno, Bartlett, Baumann, Williams, & Dickens, 2010) [152].

Studies have identified several variables that influence the relationship between gratitude and prosocial behavior, as well as some other variables that do not appear to matter. For instance, the agency and free will of the benefactor seems important: In one study, participants reported feeling more grateful, and were more generous, after receiving money that they believed a partner chose to give them than when they were given the same amount by chance (Tsang, 2006a) [2]. Other experiments have found that: 1) It did not matter how similar or dissimilar participants were to their benefactor—their levels of gratitude or prosocial behavior did not change; 2) a benefactor's intentions for their gift—conveyed via notes that accompanied the gift that either said, “I saw that you didn't get a lot in the last round—maybe I can help you out” or “Now you owe me”—influenced the recipients' levels of gratitude but not their prosocial behavior; 3) participants were not more grateful or generous to partners they expected to encounter again—in fact, participants tended to be more generous to partners with whom they did not expect to interact again in the future; and 4) there was not a significant difference in the generosity of grateful participants who gave gifts anonymously versus

those who were told that they would be identified as the benefactor, suggesting that gratitude is associated more with a general altruistic motivation to “pay it forward” than with a more selfish motivation to receive credit for one's generosity (Tsang & Martin, 2017) [0].

Receiving expressions of gratitude may increase prosocial behavior

Being on the receiving end of gratitude can also lead to prosocial behavior, according to the results of a few studies. In one study, participants who were thanked for helping with a student's cover letter were significantly more likely than people who were not thanked to help the student with another cover letter or to help a different student with a cover letter, and a field experiment found that fundraisers who received an expression of gratitude from their director increased the number of donor solicitation calls they made (Grant & Gino, 2010) [313]. This study found that the effect of gratitude expression on prosocial behavior could be explained by increased feelings of social worth. In other words, the authors say, “Gratitude expressions increase prosocial behavior by enabling individuals to feel socially valued.”

In another study, people who reported seeing elements of Louisiana's gratitude campaign thanking people who had helped following Hurricane Katrina—a campaign that included TV spots, print ads, billboards, and radio announcements—were significantly more likely to report a willingness to volunteer for and contribute money to recovery and relief efforts in the future than people who did not report seeing the campaign (Raggio & Folse, 2011) [18].

There is also some evidence that saying “thank you” can mobilize another prosocial citizenship behavior: voting. A study of three U.S. elections found that voters who were sent a postcard thanking them for voting in the last election were significantly more likely to vote in the next election than those who were sent a postcard just encouraging them to vote. This effect was surprisingly strong, and it successfully mobilized a diverse range of voters. (Panagopoulos, 2011) [77].

Relationship Benefits

As the last section demonstrates, gratitude can motivate people to act in ways that benefit others. A growing body of research suggests it can do more than that: Gratitude is also important for the formation and maintenance of social relationships.

Gratitude’s role in forming relationships

A study of a University of Virginia sorority’s “Big Sister Week,” during which a “Big Sister” anonymously showered gifts on a “Little Sister” in the sorority, illustrates how gratitude can provide the foundation for a relationship. In the study, Little Sisters who reported that their Big Sister gave them gifts that seemed more thoughtfully selected with them specifically in mind reported feeling more grateful for their gifts; the Little Sisters’ gratitude predicted the strength of their future relationship with their Big Sisters, as well as their feelings of integration within the sorority (Algoe, Haidt, & Gable, 2008) [473].

This was one of the first studies to suggest that gratitude likely plays a role in forming relationships, and it provided a basis for Sara Algoe’s “find-remind-and-bind” theory of the importance of gratitude in building and support-

ing close relationships: By helping people recognize the thoughtfulness of others, gratitude helps them “find” or identify people who are good candidates for quality future relationships; it also helps “remind” people of the goodness of their existing relationships; and it “binds” them to their partners and friends by making them feel appreciated and encouraging them to engage in behaviors that will help prolong their relationships.

Another study provides further evidence of gratitude’s power in forming relationships (Bartlett, Condon, Cruz, Baumann, & Desteno, 2012) [83]. In one experiment, participants who had received help from another “participant” (actually a confederate working with the researchers) with a computer mishap felt gratitude and were significantly more likely to choose to come back to the lab and work with that participant again in another study, as opposed to working alone. Participants whose computers did not crash (and thus who did not receive assistance) were significantly more likely to request to work alone. A second experiment found that participants who had been helped by the participant/confederate would later forgo money-making opportunities in a virtual game in order to include the helpful participant/confederate in that game.

Together these results suggest that gratitude does more than just motivate people to pay others back directly; it can also motivate more complex decisions to strengthen a relationship, such as increasing a person’s desire to spend time with someone and encouraging socially protective and inclusive behaviors, even when they’re costly.

Another study looked specifically at whether expressions of gratitude make the recipient of that gratitude want to form a relationship with

the person expressing it (Williams & Bartlett, 2015) [23]. In this experiment, undergraduate students provided comments on an essay that a high school mentee had written as part of a college application. Some of those undergraduate mentors then received a handwritten note from their mentee that simply acknowledged receipt of the feedback. But mentors who received a handwritten note from their mentee that also included an expression of gratitude were significantly more appreciative of their mentee, rated them as significantly higher in interpersonal warmth, and, most importantly, reported greater intentions to affiliate with them in the future. Additionally, participants in the thank you note condition were significantly more likely to leave their contact information for their mentee.

This study suggests that receiving expressions of gratitude can motivate people to affiliate with the grateful person again in the future, further supporting gratitude's role in forming and reinforcing social bonds.

Gratitude's role in maintaining relationships

Over the past decade, several studies have also found evidence that gratitude plays an important role not only in forming relationships but in maintaining them over time.

One of the first studies to look at this function of gratitude was led by Sara Algoe and colleagues. It looked specifically at the role of gratitude in relationships of cohabitating heterosexual couples (Algoe, Gable, & Maisel, 2010) [233]. This study found that receiving a thoughtful benefit from a partner was followed by increased feelings of gratitude and indebtedness. While men in the couple reported more mixed emotions than did women, experiencing more

gratitude from these acts of kindness predicted both partners feeling more connected and satisfied with their relationship the next day.

Unlike indebtedness, the researchers suggest that feelings of gratitude can be "booster shots" for long-term relationships. This is the "remind" component of the find-remind-bind theory. "Gratitude helps to remind an individual of his or her feelings toward the partner and inspire mutual responsiveness, which serves to increase the bond between the couple," they write.

Another study found that expressing gratitude toward a romantic partner or close friend was positively associated with the extent to which the expresser felt responsible for their partner's welfare (a measure called "communal strength"). Also, a longitudinal survey that was part of this study found that people who reported expressing more gratitude toward their partner or friend at the beginning of the study reported higher ratings of communal strength six weeks later, and people who increased their expressions of gratitude toward a friend or partner also increased their perceptions of communal strength (Lambert et al., 2010) [164]. This study suggests that as people express more gratitude toward their partner or friends, that may have the added benefit of making them feel more responsible for the well-being of those other people.

A subsequent study asked some participants to express gratitude more frequently to a friend or romantic partner; other participants were asked to focus on their daily activities, increase their grateful thoughts about their partner, or focus on positive memories that included their partner. The researchers found that, compared to the other participants, those who expressed more gratitude toward a romantic partner or close

friend at one time point reported greater comfort in voicing relationship concerns in the future, and that expressing gratitude more often led to more positive perceptions of a friend, which in turn led the participants to be more comfortable voicing relationship concerns (Lambert & Fincham, 2011) [124]. These findings might have therapeutic implications, as they suggest that expressing more gratitude to a partner or friend may nurture other skills that help improve relationships, such as making people feel more comfortable discussing potential relationship conflicts.

Studies focusing specifically on romantic relationships have found additional evidence that gratitude is important to maintaining satisfying relationships. In one study, a partner's levels of felt and expressed gratitude were both significantly associated with how satisfied they were with their marriage. Interestingly, one partner's ratings of felt gratitude also predicted their spouse's marital satisfaction, but their levels of expressed gratitude did not (C. L. Gordon, Arnette, & Smith, 2011) [80]. A longitudinal study that followed newlywed couples for four years found that experiencing gratitude allowed spouses to detect the things their partner did to maintain the relationship—such as taking on extra chores or expressing their relationship commitment—and also motivated them to take their own steps to maintain their relationship (Kubacka, Finkenauer, Rusbult, & Keijsers, 2011) [75]. And another study found that people felt gratitude for the investments that their romantic partners made toward their relationship and that this gratitude motivated them to further commit to their partners—and this was especially true for individuals who originally

had lower relationship satisfaction (Joel, Gordon, Impett, MacDonald, & Keltner, 2013) [29].

Unfortunately, there might be a dark side to this phenomenon: One study suggests that gratitude may motivate some people to maintain their relationship even when that relationship is an abusive one (Griffin et al., 2016) [1].

Expanding on gratitude's role in maintaining romantic relationships, some studies have looked at the other side of the gratitude experience: the feeling of appreciation induced in a partner who is thanked. For example, one study found that people who reported feeling more appreciated by their partners also reported feeling more appreciation for their partners and a higher likelihood of commitment to their partners nine months later (A. M. Gordon, Impett, Kogan, Oveis, & Keltner, 2012) [116]. Additionally, when outside observers watched the couples engage in conversation in a lab setting, they rated people who self-reported being more appreciative of their partners as being more responsive and committed to their partners than less appreciative partners were.

Research suggests that more thoughtful expressions of gratitude may lead to the greatest relationships gains. One study looked at how expressions of gratitude in a laboratory setting related to relationship quality six months later (Algoe, Fredrickson, & Gable, 2013) [79]. Specifically, researchers measured how the partner receiving the expression of gratitude perceived the expressing partner's "responsiveness"—"the extent to which the expresser was thought to understand, validate, and care for the participant"—as well as the receiving partner's satisfaction with their relationship at a six-month follow up visit. They found that higher perceptions of

partner responsiveness predicted greater feelings of relationship satisfaction six months later. And a separate study found that when one partner's expression of gratitude included more praise for the other partner, the receiving partner perceived the expressing partner as being more responsive to their needs, felt better about their partner in general, and felt more loving in particular (Algoe, Kurtz, & Hilaire, 2016) [4].

Gratitude may also help both individuals and relationships weather challenging situations, such as dealing with the stress of breast cancer (Algoe & Stanton, 2012) [74], depression (husbands' gratitude expressions decreased wives' depression but not vice versa) (Chang, Li, Teng, Berki, & Chen, 2013) [16], financial distress (Barton, Futris, & Nielsen, 2015) [12], and caring for aging parents (Amaro, 2017) [1].

Evidence that gratitude interventions can improve relationships

Research suggests that these relationship benefits aren't available only to the naturally grateful (and their partners); instead, studies have identified specific gratitude practices that can help strengthen relationships.

One study found that participants who were assigned to express gratitude or kindness toward people in their lives reported greater increases in relationship satisfaction six weeks after the intervention than did participants who were assigned to an activity focused on themselves or to a control condition where they listed things that had happened that day (O'Connell, O'Shea, & Gallagher, 2016) [10].

A study of divorced or separated participants found that those who were assigned to keep a gratitude journal for 10 days showed a great-

er tendency toward forgiveness in general, and forgiveness toward their ex-spouses in particular, than other participants (Rye et al., 2012) [20]. In another study of cohabiting heterosexual couples, partners who were asked to have four to six conversations over the course of a month where they expressed gratitude to their partner reported more improvements in their personal well-being, and in the well-being of their relationship, than did participants who were instructed to have a conversation with their partner in which they disclosed something personal about themselves (Algoe & Zhaoyang, 2016) [12]. Importantly, in order to enjoy these benefits, the partner who was being thanked had to feel that their partner was "understanding, validating, and caring" (responsive) in their gratitude expression; compared to people in the control group who had unresponsive partners, recipients of gratitude who perceived their partner's gratitude sentiments as not understanding, validating, and caring actually had greater negative emotions for the following 28 days. This result suggests that interpersonal gratitude interventions such as this one may only work when a partner is thoughtful in their gratitude expression; faked or forced expressions of gratitude may backfire and make partners feel worse.

Potential mechanisms

Besides Algoe's find-remind-bind theory (Algoe, 2012) [147], several studies have explored potential mechanisms for how gratitude helps people form and maintain relationships. Studies have found that experiencing gratitude can lead one person to mimic another's behaviors (Jia, Lee, & Tong, 2015) [10], share another person's goals (Jia, Tong, & Lee, 2014) [15], be more open to receiving

advice (Gino & Schweitzer, 2008) [169], increase the tendency to forgive (Neto, 2007) [89], and display less aggression (DeWall, Lambert, Pond, Kashdan, & Fincham, 2012) [45]. All of these behaviors generally support positive relationships.

Workplace Benefits

While there have been only a handful of studies examining the possible benefits of gratitude in workplaces, these studies suggest that gratitude may help employees perform their jobs better, feel more satisfied at work, and act more helpfully and respectfully toward their coworkers.

Evidence that gratitude is associated with better outcomes at work

- *Grateful employees may be high performers*
A recent line of studies suggests that gratitude may help employees' work performance. A study of call center employees found that "other-oriented employees"—employees who highly value and experience concern for others and their well-being—experience higher levels of anticipated guilt and gratitude, which appears to motivate them to be high performers at work (Grant & Wrzesniewski, 2010) [145].

According to another study, an employee's level of gratitude may be a predictor of the type of role in which they are likely to succeed (Ruch, Gander, Platt, & Hofmann, 2016) [0]. This study found that gratitude was one predictor of two types of professional roles in which a person was likely to thrive—idea creator and relationships manager—whereas other strengths (such as persistence, authenticity, or bravery) were predictors of other roles (such as information gatherer, decision-maker, or influencer, respectively).

- *Gratitude may increase job satisfaction*

One study suggests that gratitude makes people feel more satisfied at work. This study of employees from the teaching and finance sectors found that both individual state gratitude—feelings of gratitude that vary day-to-day—and institutionalized gratitude—the gratitude that is embedded in the culture and policies of an organization—both uniquely and significantly predicted job satisfaction (Waters, 2012) [28]. Dispositional gratitude, however, did not significantly predict job satisfaction.

- *Gratitude may increase prosocial behavior at work*

Another line of research ties gratitude to prosocial behavior in the workplace. In one study, a manager's tendency to experience pride was positively associated both with self-reported feelings of gratitude and with the extent to which the manager engaged in social justice behaviors as reported by staff (e.g. showing concern for the rights of others), and the level of gratitude that managers felt could account for the relationship between pride and social justice behaviors (Michie, 2009)[64]. This suggests that when a leader's feelings of pride are followed by gratitude toward the employees who helped contribute to the manager's success, it may cause the leader to place more focus on the well-being of people inside and outside the organization.

The link between gratitude and prosocial workplace behavior is not limited to managers. A study of white-collar employees found that employees who had a stronger tendency to experience hope and gratitude also reported a greater sense of responsibility toward employee and societal issues (Andersson, Giacalone, &

Jurkiewicz, 2007) [93]. And another study found that daily state gratitude levels predicted organizational citizenship behaviors—such as helping others with work-related problems—toward coworkers and supervisors (Spence, Brown, Keeping, & Lian, 2013) [19].

Finally, a study found that when workers believed their organization supported their needs, they reported higher levels of overall gratitude toward the organization—and this gratitude was, in turn, associated with them more frequently performing behaviors that helped the organization (such as volunteering for additional work tasks) (M. T. Ford, Wang, Jin, & Eisenberger, 2017) [2]. Additionally, the extent to which supervisors helped employees was associated with daily fluctuations in feelings of gratitude, which were then associated with fluctuations in the frequency with which the employees performed behaviors that helped the organization. In short, when organizations and supervisors helped employees, those employees felt gratitude and went on to help their organization more frequently than other employees did.

Evidence that gratitude interventions can improve the workplace

A few studies have had employees perform specific gratitude practices in various workplace contexts and found that such practices led to a number of benefits for employees and the workplace alike. For example, as mentioned previously, one study found that fundraisers who received an expression of gratitude from their director then significantly increased the number of donor solicitation calls they made (Grant & Gino, 2010) [313].

Additionally, when researchers asked teachers to count their blessings for eight weeks, those teachers experienced increased life satisfaction, a more positive mood, and a greater sense of accomplishment, along with decreased negative attitudes towards others and less emotional exhaustion, suggesting that this intervention could help prevent burnout in their profession (Chan, 2010) [98] (Chan, 2011) [54]. Similarly, when health care practitioners wrote down work-related blessings twice a week over four weeks, that led to a decline in their symptoms of depression and perceived stress (Cheng, Tsui, & Lam, 2015) [27]. And when university employees recorded things about their job for which they were grateful, they later reported significant increases in gratitude and in the intensity and frequency of positive feelings about their jobs (Kaplan et al., 2014) [37].

What are some key lessons from this research for workplace leaders who want to bring these emerging benefits of gratitude into their organization? A recent theoretical paper by Ryan Fehr and colleagues provided a “a multilevel model of gratitude in organizations” (Fehr, Fulmer, Awtrey, & Miller, 2017) [4]. In this paper, the authors discuss proposed relationships between three levels of gratitude seen in the workplace: episodic gratitude (feeling grateful in response to a particular experience), persistent gratitude (“a stable tendency to feel grateful within a particular context”), and collective gratitude (“persistent gratitude that is shared by the members of an organization”).

The researchers propose that these three forms of gratitude build upon each other: Fostering gratitude at the organizational level can be facilitated by frequently cultivating episodic gratitude in individual employees. Drawing

on previous research, the paper also discusses three types of gratitude-focused HR practices (or gratitude initiatives) that the authors see as key ways for workplaces to foster episodic gratitude in their employees: 1) appreciation programs (which include formal events that recognize and appreciate employees, such as celebrations

of retirements or product launches); 2) opportunities for employees to have contact with the people who benefit from the work that they do; and 3) developmental feedback from managers that focuses on their employees' personal development and career growth.

Gratitude Interventions

The recent wave of new research on gratitude has spawned various types of gratitude interventions, many of which are discussed in the “Benefits” sections above. Here we provide brief descriptions of a few of the more popular and noteworthy gratitude interventions (and links to the pages on [Greater Good in Action](#), a website created by the Greater Good Science Center, that provide more detail about how to adopt some of these interventions). This section also includes a discussion of factors that may influence who may be likely to adopt, complete, and benefit from such interventions, along with the results of meta-analysis studies that have examined the efficacy of these interventions.

Types of Interventions

Counting blessings (aka, Gratitude journals)

In a 2003 study, Emmons and McCullough introduced an intervention designed to increase gratitude that they called “counting blessings” (Emmons & McCullough, 2003) [2376]. This activity involves writing down five things for which participants were grateful (the “counting blessings”) either daily or weekly. In the years since Emmons and McCullough published this study, many other researchers have conducted experiments using variations of the counting blessings/gratitude journal activity.

Three Good Things

In a 2005 study, Martin Seligman and colleagues tested a variation of the counting blessings intervention, which they called “Three Good Things” (Seligman et al., 2005) [418]. This activity involves not only writing down three things that went well but also identifying the causes of those good things.

Mental subtraction

Another variation of the counting blessings paradigm is called “mental subtraction.” This activity involves imagining what life would be like if a positive event had not occurred (Koo, Algoe, Wilson, & Gilbert, 2008) [101]. In one set of experiments, people who wrote about what it would be like if positive events in their life had not occurred reported improved mood, providing evidence for what the researchers call the “George Bailey effect” after the protagonist in the famous 1946 movie *It’s A Wonderful Life*.

Gratitude letters and gratitude visits

Seligman’s 2005 study also included a “gratitude visit” intervention in which participants wrote and delivered a letter of gratitude in person to someone who they had never properly thanked (Seligman et al., 2005) [418]. A number of other studies have tested variations of the gratitude letter/visit intervention (Watkins et al., 2003) [628] (Lyubomirsky et al., 2011) [427] (Toepfer et al., 2012) [98] (Froh, Kashdan, et al., 2009) [268].

Death reflection

Reflecting on one's death can also increase gratitude (Frias, Watkins, Webber, & Froh, 2011) [45]. In one study, undergraduate students who were asked to either imagine dying in a very specific and visceral manner, or to more generally imagine their death, experienced more gratitude after the intervention than did students asked to reflect on a "typical day." "Because our very existence is a constant benefit that we adapt to easily, this is a benefit that is easily taken for granted," write the researchers. "Reflecting on one's own death might help individuals take stock of this benefit and consequently increase their appreciation for life."

Experiential consumption

Another study points to what might be a surprising method for increasing gratitude: "experiential consumption," meaning spending money on experiences rather than things (Walker, Kumar, & Gilovich, 2016) [1]. Across six experiments, this study found that people felt and expressed more gratitude following a purchase of an experience (e.g., concert tickets or meals out) than a purchase of a material good (e.g., clothing or jewelry). According to the researchers, these experiments suggest that "as a naturalistic behavior that is relatively resistant to adaptation, experiential consumption may be an especially easy way to encourage the experience of gratitude."

Factors That Influence Gratitude Intervention

Adoption and Success

There are several factors that can influence whether particular people are likely to engage in gratitude interventions and whether or not these interventions will be successful.

Factors associated with willingness to adopt and complete gratitude interventions

Certain traits make people more willing to give gratitude activities a try. Studies have found that people who have a strong desire to change their lifestyle (Kaczmarek et al., 2013) [24], people with greater trait curiosity (Kaczmarek, Kashdan, Drazkowski, Bujacz, & Goodman, 2014) [13], and people with fewer depressive symptoms are more likely to enroll in gratitude intervention trials (Kaczmarek, Kashdan, et al., 2014) [13], and women are more likely to sign up than men (Kaczmarek, Kashdan, et al., 2014) [13]. Interestingly, another study found that providing instructional support, in the form of testimonials written about how best to conduct a gratitude intervention, had a paradoxical effect and actually decreased people's intentions to try the intervention (Kaczmarek, Goodman, et al., 2014) [9].

When it comes to completing a gratitude intervention, one study found that college students were more likely to complete a gratitude journal intervention than a gratitude letter intervention, possibly because they felt that writing the letter was less efficacious; students with high dispositional gratitude were also more likely to complete an intervention, and women were more likely to complete the intervention than men (Kaczmarek et al., 2015) [12]. Another study found that people with more agency—those who were more determined to complete their goals—were more likely to complete a counting blessings intervention than people with less agency, suggesting that boosting people's sense of agency during the course of an intervention may make it more likely that they will follow through (Geraghty, Wood, & Hyland, 2010b) [124]. And a study of a counting blessings intervention, used

to decrease participants' feelings of dissatisfaction with their bodies, found that participants who reported a higher expectation that the intervention would work were more likely to complete the intervention, as were those who had reported a higher belief that "personal behavioral factors are responsible for their health" (as opposed to being determined by chance or their doctors) (Geraghty, Wood, & Hyland, 2010a) [145].

Who benefits the most from gratitude interventions?

Other studies have examined various factors that may influence how much different people benefit from a gratitude intervention. For example, studies have found that gratitude interventions have better outcomes for people who are less neurotic (W. Ng, 2016) [6], have lower positive affect (Froh, Kashdan, et al., 2009) [268], are more self-critical (Sergeant & Mongrain, 2011) [86], and are less needy (Sergeant & Mongrain, 2011) [86].

Cross-cultural studies have found evidence that the efficacy of some interventions may be somewhat culturally dependent. For example, one study found that white Americans showed larger increases in life satisfaction than Asian Americans following two happiness interventions, one of which involved writing letters of appreciation to family members or friends (Boehm, Lyubomirsky, & Sheldon, 2011) [178]. According to the researchers, "These results are consistent with the idea that the value individualist cultures place on self-improvement and personal agency bolsters the efforts of Anglo Americans to become more satisfied." Thus, they suggest, people from collectivist cultures, which tend to de-emphasize self-focus, may see reduced benefits from this type of intervention.

Another study found that South Korean college students benefited significantly less than U.S. college students from a gratitude letter intervention (Layous, Lee, Choi, & Lyubomirsky, 2013) [70]. This study also found that there was a stronger relationship between self-reported effort in the interventions and increases in well-being among the U.S. participants than the South Korean participants. The researchers hypothesize that the South Korean participants may have "been more prone to feel mixed emotions (e.g., indebtedness and gratitude) while engaging in the gratitude letter activity than did U.S. participants."

Vexingly, research has shown that sometimes pursuing increased happiness can have a paradoxical effect and actually decrease well-being (Mauss, Tamir, Anderson, & Savino, 2011) [220]. Evidence from a study of people from four geographical regions (United States, Germany, Russia, and East Asia) suggests that culture may influence this relationship as well. The study found that people's motivation to pursue happiness "predicted lower well-being in the United States, did not predict well-being in Germany, and predicted higher well-being in Russia and in East Asia" (B. Q. Ford et al., 2015) [23]. The researchers hypothesize that this pattern may be explained by the degree to which these cultures are more individualistic (like the U.S.) versus collectivist. For participants in the more collectivist cultures (Russia and East Asia), there was an association between the motivation to pursue happiness and definitions of happiness that center on engagement with other people; this relationship was not seen in the more individualistic countries. This means that "happiness holds different meanings depending on individuals' cultural context," something that should be kept

in mind when testing gratitude interventions that have the goal of increasing happiness.

Do Gratitude Interventions Work?

Do gratitude interventions work? As can be seen from the discussion above, studies of gratitude interventions have varied a great deal in their methods, participants, and results. However, a few meta-analytical studies have attempted to look at the overall efficacy of gratitude interventions.

Youth gratitude interventions

A recent meta-analysis of studies examining gratitude in youth and schools concluded, “On the whole, gratitude exercises for promoting youths’ subjective well-being and decreasing subjective distress are generally ineffective, although isolated studies have deemed them effective for select outcomes” (Renshaw & Olinger Steeves, 2016) [7]. After combining the data from the various intervention studies, the researchers only found that positive affect showed a significant (yet small) positive effect across multiple studies. However, this meta-analysis also reports the small positive effects—children’s enhanced ability to think gratefully (benefits appraisal) and increased behavioral gratitude (displayed by writing thank you notes)—seen in Froh et al.’s single 2014 study and suggests that this intervention warrants further study.

Gratitude interventions for adults

A 2010 meta-analysis examined the existing literature at that time—12 studies—regarding gratitude interventions for adults (Wood et al., 2010) [673]. This analysis determined that these studies “clearly suggest that interventions to increase gratitude are effective in improving well-be-

ing” but also pointed out that the use of control groups was inconsistent. They suggest that future studies should use no-treatment or waiting list controls, a control group that controls for a possible placebo effect, and—for tests of clinical interventions—standard validated treatments as alternatives to the gratitude intervention so that the effectiveness of the gratitude interventions can be compared to the effectiveness of these previously validated treatments.

A 2015 meta-analysis study analyzed the results of 26 studies of various gratitude interventions (Davis et al., 2015) [27]. It found that people who participated in gratitude interventions showed greater psychological well-being (but not gratitude) than people in control groups who did not do an intervention; people in gratitude interventions also showed greater improvements in psychological well-being and gratitude—but not reduced levels of anxiety—when compared with people in control groups who did non-gratitude activities. This study also found that gratitude interventions generally performed about as well as other psychologically active interventions, such as acts of kindness. The paper suggests that gratitude interventions may work primarily through the placebo effect, which is not necessarily problematic, although future studies are surely warranted to investigate the mechanisms that underlie the results seen with various gratitude interventions.

A more recent meta-analysis study that analyzed the results of 38 gratitude studies concluded that “gratitude interventions can have positive benefits for people in terms of their well-being, happiness, life satisfaction, grateful mood, grateful disposition, and positive affect, and they can result in decreases in depressive

symptoms” (Dickens, 2017) [0]. However, it also notes that the findings regarding negative affect and stress were mixed, and there were not significant findings around improvements in physical

health, sleep, prosocial behavior, or self-esteem. Additionally, gratitude interventions were rarely more effective than other kinds of positive interventions.



Limitations and Future Directions

We hope that this white paper presents a fairly comprehensive overview of the burgeoning field of gratitude research. It also illustrates the many avenues of research that could be further explored, as well as some of the many open questions that remain to be tackled. Below are a few of the limitations of the current gratitude research, as well as some of the most promising future directions.

The dark side of gratitude

While this paper, in line with the vast majority of published studies, focuses primarily on the positive aspects of gratitude, there exists some evidence that gratitude has a significant dark side that warrants further exploration. For example, one study found that people with disabilities who relied on informal support for their care often felt burdened by gratitude. Specifically, they reported feeling forced to express gratitude in order to secure the support that they needed and expressed shame and frustration over the one-sided nature of their dependent relationships. In contrast, people with disabilities who were able to pay for formal support reported feeling more comfortable and more in control of their lives (Galvin, 2004) [48].

Gratitude, while helping to form and maintain relationships, may sometimes play a nefarious role in them. For example, research suggests that relationship problems can occur when gratitude becomes a type of currency, and one (or both) partner(s) feels “underpaid” (Kubacka et al., 2011) [75], and a recent study of survivors of dating violence suggests that

survivors with more dispositional gratitude may work harder than less grateful people to try to maintain a relationship in which they are being abused (Griffin et al., 2016) [1]. Another flipside of gratitude’s ability to facilitate social bonding is that it may also make it more difficult for people who have received a large gift or favor to establish appropriate relationship boundaries (Lavelock et al., 2016) [2].

In fact, in situations of harm, inequity, and injustice, “a lack of gratitude may be a more moral response,” writes Liz Jackson, an associate professor of education at the University of Hong Kong (Jackson, 2016) [1]. She continues: “Promoting propositional gratitude to disadvantaged people of color in the United States, to manual laborers, people in abusive partnerships or children in bad family situations may benefit the individual or people psychologically and instrumentally. Yet it may lead as well to denial of challenges faced, or irrational minimization of problems, when suggested as a coping mechanism or everyday practice across such contexts.” These darker elements of the gratitude experience warrant further investigation.

Further defining and categorizing gratitude experiences

The scientific literature also needs more work to define and categorize different types of gratitude and gratitude experiences. This is especially true for the developmental literature, as there is still much that is unknown about how children of different ages experience and develop gratitude.

Similarly, there is still considerable room for future studies to examine cultural differences in gratitude experiences, and how well lay people's understanding of gratitude lines up with what researchers are measuring via gratitude scales, both of which could inform applied research on gratitude interventions.

The relationship between gratitude and other constructs

More work is also required to clarify the relationship between gratitude and other constructs, including the relationship between gratitude and indebtedness or obligation in various contexts and how gratitude relates to other virtues such as humility, love, and forgiveness. Additionally, interesting questions remain unexplored around the inverse relationship between narcissism and gratitude, particularly in terms of the potential mechanisms through which narcissism may inhibit gratitude. In other words, as a team of researchers recently put it, "Does narcissism inhibit gratitude because narcissistic individuals believe they deserve and are entitled to benefits from others? Does narcissism inhibit gratitude because people high in narcissism do not appreciate the benefits that others provide for them?" (Solom et al., 2017) [7].

Educational interventions

When it comes to the educational context, researcher Blaire Morgan at the University of Birmingham and colleagues caution that current interventions lack sufficient consideration of the complexities of gratitude and cultural contexts that could influence the ways in which students experience gratitude (Morgan, Gulliford, & Carr, 2015) [10]. They argue that it does students a disservice to convey that gratitude is indiscriminately positive and worthy of cultivating without asking them to examine situations where gratitude may not be an appropriate response. They also caution about the potential downsides of focusing on extrinsic benefits to motivate students to complete gratitude interventions, noting that this might have a side effect of actually decreasing experiences of gratitude for gratitude's sake.

Morgan and colleagues suggest that future gratitude interventions for children should encourage more reflection and analysis, including of benefactors' often mixed motives. They are experimenting with such interventions in the form of workbooks for children ages 8-11.

Other directions in the educational realm may include research on cultivating learning environments that are more conducive to positive psychology interventions; on cultural, gender, and other factors that may determine how effective gratitude interventions are; the use of booster sessions to prolong the benefits of gratitude interventions; and the integration of gratitude interventions into literacy programs (Lomas, Froh, Emmons, Mishra, & Bono, 2014) [10].

Gratitude's influence on physical and mental health

Research regarding gratitude's influence on physical health has been getting off the ground in recent years, and future studies will likely elucidate the extent to which both dispositional gratitude and gratitude interventions can improve people's health and health behaviors. In particular, these studies will hopefully shed light on the mechanisms that underlie the association between gratitude and positive health outcomes (Davis et al., 2015) [27].

When it comes to mental health, additional studies will be needed to determine whether gratitude interventions can successfully replace and/or complement existing therapeutic treatments and determine why some interventions work for some people and not others. To establish the true efficacy of such interventions, ideally these studies will involve randomized control trials with adequate sample sizes that compare gratitude interventions to already validated gold standard treatments.

Gratitude in the workplace

Another area that is rich with possible research questions and potential applications is the role of gratitude in the workplace. To date there have only been a few studies exploring the causes and effects of gratitude in the workplace, yet their results suggest that this may be fertile scientific ground. And of course, many of gratitude's benefits suggested by other studies—its positive role in relationships, its links to motivation, its association with positive health—have obvious implications for the workplace.

Future studies may include randomized controlled experiments of various appreciation programs and gratitude interventions to see which effectively increase employees' gratitude experiences at work. In particular, these studies may be able to test some of the propositions presented in "The Grateful Workplace" paper by Fehr and colleagues, such as: "Appreciation programs increase episodic gratitude," employees will feel grateful more often if they come into contact with people who benefit from their work, and "Collective gratitude increases corporate social responsibility" (Fehr et al., 2017) [4].

References

- Adler, M. G., & Fagley, N. S. (2005). Appreciation: Individual differences in finding value and meaning as a unique predictor of subjective well-being. *Journal of Personality*, 73(1), 79–114. <https://doi.org/10.1111/j.1467-6494.2004.00305.x>
- Algoe, S. B. (2012). Find, Remind, and Bind: The Functions of Gratitude in Everyday Relationships. *Social and Personality Psychology Compass*, 6(6), 455–469. <https://doi.org/10.1111/j.1751-9004.2012.00439.x>
- Algoe, S. B., Fredrickson, B. L., & Gable, S. L. (2013). The social functions of the emotion of gratitude via expression. *Emotion*, 13(4), 605–609. <https://doi.org/10.1037/a0032701>
- Algoe, S. B., Gable, S. L., & Maisel, N. C. (2010). It's the little things: Everyday gratitude as a booster shot for romantic relationships. *Personal Relationships*, 17(2), 217–233. <https://doi.org/10.1111/j.1475-6811.2010.01273.x>
- Algoe, S. B., & Haidt, J. (2009). Witnessing excellence in action: the “other-praising” emotions of elevation, gratitude, and admiration. *The Journal of Positive Psychology*, 4(2), 105–127. <https://doi.org/10.1080/17439760802650519>
- Algoe, S. B., Haidt, J., & Gable, S. L. (2008). Beyond reciprocity: Gratitude and relationships in everyday life. *Emotion*, 8(3), 425–429. <https://doi.org/10.1037/1528-3542.8.3.425>
- Algoe, S. B., Kurtz, L. E., & Hilaire, N. M. (2016). Putting the “You” in “Thank You.” *Social Psychological and Personality Science*, 7(7), 658–666. <https://doi.org/10.1177/1948550616651681>
- Algoe, S. B., & Stanton, A. L. (2012). Gratitude when it is needed most: Social functions of gratitude in women with metastatic breast cancer. *Emotion*, 12(1), 163–168. <https://doi.org/10.1037/a0024024>
- Algoe, S. B., & Way, B. M. (2013). Evidence for a role of the oxytocin system, indexed by genetic variation in *CD38*, in the social bonding effects of expressed gratitude. *Social Cognitive and Affective Neuroscience*, 9(12), 1855–1861. <https://doi.org/10.1093/scan/nst182>
- Algoe, S. B., & Zhaoyang, R. (2016). Positive psychology in context: Effects of expressing gratitude in ongoing relationships depend on perceptions of enactor responsiveness. *The Journal of Positive Psychology*, 11(4), 399–415. <https://doi.org/10.1080/17439760.2015.1117131>
- Amaro, L. M. (2017). Dyadic effects of gratitude on burden, conflict, and contribution in the family caregiver and sibling relationship. *Journal of Applied Communication Research*, 45(1), 61–78. <https://doi.org/10.1080/00909882.2016.1248464>
- Anderson, C. J., Bahnik, t pan, Barnett-Cowan, M., Bosco, F. A., Chandler, J., Chartier, C. R., ... Zuni, K. (2016). Response to Comment on “Estimating the reproducibility of psychological science.” *Science*, 351(6277), 1037–1037. <https://doi.org/10.1126/science.aad9163>
- Andersson, L. M., Giacalone, R. A., & Jurkiewicz, C. L. (2007). On the relationship of hope and gratitude to corporate social responsibility. *Journal of Business Ethics*, 70(4), 401–409. <https://doi.org/10.1007/s10551-006-9118-1>
- Appadurai, A. (1985). Gratitude as a Social Mode in South India. *Ethos*, 13(3), 236–245. <https://doi.org/10.1525/eth.1985.13.3.02a00020>
- Armenta, C. N., Fritz, M. M., & Lyubomirsky, S. (2017). Functions of Positive Emotions: Gratitude as a Motivator of Self-Improvement and Positive Change. *Emotion Review*, 9(3), 183–190. <https://doi.org/10.1177/1754073916669596>
- Bar-Tal, D., Bar-Zohar, Y., Greenberg, M. S., & Hermon, M. (1977). Reciprocity Behavior in the Relationship Between Donor and Recipient and Between Harm- Doer and Victim. *Sociometry*, 40(3), 293–298. <https://doi.org/10.2307/3033537>
- Bartlett, M. Y., Condon, P., Cruz, J., Baumann, J., & Deste-no, D. (2012). Gratitude: Prompting behaviours that build relationships. *Cognition & Emotion*, 26(1), 2–13. <https://doi.org/10.1080/02699931.2011.561297>
- Bartlett, M. Y., & DeSteno, D. (2006). Gratitude and prosocial behavior : Helping when it costs you. *Psychological Science*, 17(4), 319–325. <https://doi.org/10.1111/j.1467-9280.2006.01705.x>
- Barton, A. W., Futris, T. G., & Nielsen, R. B. (2015). Linking financial distress to marital quality: The intermediary roles of demand/withdraw and spousal gratitude expressions. *Personal Relationships*, 22(3), 536–549. <https://doi.org/10.1111/pere.12094>
- Baumgarten-Tramer, F. (1938). “Gratefulness” in Children and Young People. *Pedagogical Seminary and Journal of Genetic Psychology*, 53(1), 53–66. <https://doi.org/10.1080/08856559.1938.10533797>

- Boehm, J. K., Lyubomirsky, S., & Sheldon, K. M. (2011). A longitudinal experimental study comparing the effectiveness of happiness-enhancing strategies in Anglo Americans and Asian Americans. *Cognition and Emotion*, 25(7), 1263–1272. <https://doi.org/10.1080/02699931.2010.541227>
- Bonnie, K. E., & de Waal, F. B. M. (2004). Primate Social Reciprocity and the Origin of Gratitude. In *The Psychology of Gratitude* (Vol. 6, pp. 213–229). Oxford University Press. <https://doi.org/10.1093/acprof:oso/9780195150100.003.0011>
- Bono, G., Froh, J. J., Disabato, D. J., Blalock, D., McKnight, P., & Bausert, S. (2017). Gratitude's role in adolescent antisocial and prosocial behavior: A 4-year longitudinal investigation. *The Journal of Positive Psychology*, 9760(December), 1–13. <https://doi.org/10.1080/17439760.2017.1402078>
- Breen, W. E., Kashdan, T. B., Lenser, M. L., & Fincham, F. D. (2010). Gratitude and forgiveness: Convergence and divergence on self-report and informant ratings. *Personality and Individual Differences*, 49(8), 932–937. <https://doi.org/10.1016/j.paid.2010.07.033>
- Celano, C. M., Beale, E. E., Beach, S. R., Belcher, A. M., Suarez, L., Motiwala, S. R., ... Huffman, J. C. (2016). Associations Between Psychological Constructs and Cardiac Biomarkers After Acute Coronary Syndrome. *Psychosomatic Medicine*, (April), 318–326. <https://doi.org/10.1097/PSY.0000000000000404>
- Celano, C. M., Beale, E. E., Mastromauro, C. A., Stewart, J. G., Millstein, R. A., Auerbach, R. P., ... Huffman, J. C. (2017). Psychological interventions to reduce suicidality in high-risk patients with major depression: a randomized controlled trial. *Psychological Medicine*, 47(5), 810–821. <https://doi.org/10.1017/S0033291716002798>
- Chan, D. W. (2010). Gratitude, gratitude intervention and subjective well-being among Chinese school teachers in Hong Kong. *Educational Psychology*, 30(2), 139–153. <https://doi.org/10.1080/01443410903493934>
- Chan, D. W. (2011). Burnout and life satisfaction: Does gratitude intervention make a difference among Chinese school teachers in Hong Kong? *Educational Psychology*, 31(7), 809–823. <https://doi.org/10.1080/01443410.2011.608525>
- Chang, Y. P., Li, T. S., Teng, H. Y., Berki, A., & Chen, L. H. (2013). Living with Gratitude: Spouse's Gratitude on One's Depression. *Journal of Happiness Studies*, 14(4), 1431–1442. <https://doi.org/10.1007/s10902-012-9389-4>
- Chen, G. (2016). Does gratitude promote recovery from substance misuse? *Addiction Research & Theory*, 25(2), 121–128. <https://doi.org/10.1080/16066359.2016.1212337>
- Chen, L. H., & Chang, Y. (2016). Sport-domain gratitude uniquely accounts for athletes' well-being across two cultures: Incremental validity above the general gratitude. *The Journal of Positive Psychology*, 12(6), 651–659. <https://doi.org/10.1080/17439760.2016.1257052>
- Chen, L. H., & Chang, Y. P. (2014). Cross-Lagged Associations between Gratitude and Adolescent Athlete Burnout. *Current Psychology*, 33(4), 460–478. <https://doi.org/10.1007/s12144-014-9223-8>
- Chen, L. H., Chen, M.-Y., Kee, Y. H., & Tsai, Y.-M. (2009). Validation of the gratitude questionnaire (GQ) in Taiwanese undergraduate students. *Journal of Happiness Studies*, 10(6), 655–664. <https://doi.org/10.1007/s10902-008-9112-7>
- Chen, L. H., & Kee, Y. H. (2008). Gratitude and Adolescent Athletes' Well-Being. *Social Indicators Research*, 89(2), 361–373. <https://doi.org/10.1007/s11205-008-9237-4>
- Cheng, S.-T., Tsui, P. K., & Lam, J. H. M. (2015). Improving mental health in health care practitioners: Randomized controlled trial of a gratitude intervention. *Journal of Consulting and Clinical Psychology*, 83(1), 177–186. <https://doi.org/10.1037/a0037895>
- Chow, R. M., & Lowery, B. S. (2010). Thanks, but no thanks: The role of personal responsibility in the experience of gratitude. *Journal of Experimental Social Psychology*, 46(3), 487–493. <https://doi.org/10.1016/j.jesp.2009.12.018>
- Davidai, S., & Gilovich, T. (2016). The headwinds/tailwinds asymmetry: An availability bias in assessments of barriers and blessings. *Journal of Personality and Social Psychology*, 111(6), 835–851. <https://doi.org/10.1037/pspa0000066>
- Davis, D. E., Choe, E., Meyers, J., Wade, N., Varjas, K., Gifford, A., ... Worthington, E. L. (2015). Thankful for the Little Things: A Meta-Analysis of Gratitude Interventions. *Journal of Counseling Psychology*, 63(1), 20–31. <https://doi.org/10.1037/cou0000107>
- De Waal, F. B. M. (1997). The chimpanzee's service economy: Food for grooming. *Evolution and Human Behavior*, 18(6), 375–386. [https://doi.org/10.1016/S1090-5138\(97\)00085-8](https://doi.org/10.1016/S1090-5138(97)00085-8)
- Decety, J., & Porges, E. C. (2011). Imagining being the agent of actions that carry different moral consequences: An fMRI study. *Neuropsychologia*, 49(11), 2994–3001. <https://doi.org/10.1016/j.neuropsychologia.2011.06.024>
- DeSteno, D., Bartlett, M. Y., Baumann, J., Williams, L. A., & Dickens, L. R. (2010). Gratitude as moral sentiment: Emotion-guided cooperation in economic exchange. *Emotion*, 10(2), 289–293. <https://doi.org/10.1037/a0017883>
- DeSteno, D., Li, Y., Dickens, L. R., & Lerner, J. S. (2014). Gratitude: A Tool for Reducing Economic Impatience. *Psychological Science*, 25(6), 1262–1267. <https://doi.org/10.1177/0956797614529979>

- DeWall, C. N., Lambert, N. M., Pond, R. S., Kashdan, T. B., & Fincham, F. D. (2012). A Grateful Heart is a Nonviolent Heart. *Social Psychological and Personality Science*, 3(2), 232–240. <https://doi.org/10.1177/1948550611416675>
- Dickens, L. R. (2017). Using Gratitude to Promote Positive Change: A Series of Meta-Analyses Investigating the Effectiveness of Gratitude Interventions. *Basic and Applied Social Psychology*, 39(4), 193–208. <https://doi.org/10.1080/01973533.2017.1323638>
- Dickens, L. R., & DeSteno, D. (2016). The Grateful Are Patient: Heightened Daily Gratitude Is Associated With Attenuated Temporal Discounting. *Emotion*, 16(4), 421–425. <https://doi.org/10.1037/emo0000176>
- Diebel, T., Woodcock, C., Cooper, C., & Brignell, C. (2016). Establishing the effectiveness of a gratitude diary intervention on children's sense of school belonging. *Educational and Child Psychology*, 33(2), 117–129.
- Diessner, R., & Lewis, G. (2007). Further Validation of the Gratitude, Resentment, and Appreciation Test (GRAT). *The Journal of Social Psychology*, 147(4), 445–447. <https://doi.org/10.3200/SOCP.147.4.445-448>
- Disabato, D. J., Kashdan, T. B., Short, J. L., & Jarden, A. (2017). What Predicts Positive Life Events that Influence the Course of Depression? A Longitudinal Examination of Gratitude and Meaning in Life. *Cognitive Therapy and Research*, 41(3), 444–458. <https://doi.org/10.1007/s10608-016-9785-x>
- Drażkowski, D., Kaczmarek, L. D., & Kashdan, T. B. (2017). Gratitude pays: A weekly gratitude intervention influences monetary decisions, physiological responses, and emotional experiences during a trust-related social interaction. *Personality and Individual Differences*, 110, 148–153. <https://doi.org/10.1016/j.paid.2017.01.043>
- Dunn, J. R., & Schweitzer, M. E. (2005). Feeling and Believing: The Influence of Emotion on Trust. *Journal of Personality and Social Psychology*, 88(5), 736–748. <https://doi.org/10.1037/0022-3514.88.5.736>
- Elfers, J., & Hlava, P. (2016). The spectrum of gratitude experience. *The Spectrum of Gratitude Experience*, Basingstoke, Hampshire [England]: Palgrave Macmillan. <https://doi.org/10.1007/978-3-319-41030-2>
- Emmons, R. A., & Crumpler, C. A. (2000). Gratitude as a Human Strength: Appraising the Evidence. *Journal of Social and Clinical Psychology*, 19(1), 56–69. <https://doi.org/10.1521/jscp.2000.19.1.56>
- Emmons, R. A., & Kneezel, T. T. (2005). Giving Thanks : Spiritual and Religious Correlates of Gratitude. *Journal of Psychology and Christianity*, 24(2), 140–148.
- Emmons, R. A., & McCullough, M. E. (2003). Counting blessings versus burdens: An experimental investigation of gratitude and subjective well-being in daily life. *Journal of Personality and Social Psychology*, 84(2), 377–389. <https://doi.org/10.1037/0022-3514.84.2.377>
- Emmons, R. A., & Stern, R. (2013). Gratitude as a psychotherapeutic intervention. *Journal of Clinical Psychology*, 69(8), 846–855. <https://doi.org/10.1002/jclp.22020>
- Etz, A., & Vandekerckhove, J. (2016). A Bayesian perspective on the reproducibility project: Psychology. *PLoS ONE*, 11(2), 1–12. <https://doi.org/10.1371/journal.pone.0149794>
- Fagley, N. S. (2012). Appreciation uniquely predicts life satisfaction above demographics, the Big 5 personality factors, and gratitude. *Personality and Individual Differences*, 53(1), 59–63. <https://doi.org/10.1016/j.paid.2012.02.019>
- Farwell, L., & Wohlwend-Lloyd, R. (1998). Narcissistic processes: Optimistic expectations, favorable self-evaluations, and self-enhancing attributions. *Journal of Personality*, 66(February 1998), 65–83. <https://doi.org/10.1111/1467-6494.00003>
- Fehr, R., Fulmer, A., Awtrey, E., & Miller, J. A. (2017). The grateful workplace: A multilevel model of gratitude in organizations. *Academy of Management Review*, 42(2), 361–381. <https://doi.org/10.5465/amr.2014.0374>
- Ford, B. Q., Dmitrieva, J. O., Heller, D., Chentsova-Dutton, Y., Grossmann, I., Tamir, M., ... Mauss, I. B. (2015). Culture shapes whether the pursuit of happiness predicts higher or lower well-being. *Journal of Experimental Psychology: General*, 144(6), 1053–1062. <https://doi.org/10.1037/xge0000108>
- Ford, M. T., Wang, Y., Jin, J., & Eisenberger, R. (2017). Chronic and Episodic Anger and Gratitude Toward the Organization: Relationships With Organizational and Supervisor Supportiveness and Extrarole Behavior. *Journal of Occupational Health Psychology*, 23(2), 175–187. <https://doi.org/10.1037/ocp0000075>
- Forster, D. E., Pedersen, E. J., Smith, A., McCullough, M. E., & Lieberman, D. (2017). Benefit valuation predicts gratitude. *Evolution and Human Behavior*, 38(1), 18–26. <https://doi.org/10.1016/j.evolhumbehav.2016.06.003>
- Fox, G. R., Kaplan, J., Damasio, H., & Damasio, A. (2015). Neural correlates of gratitude. *Frontiers in Psychology*, 6(September), 1491. <https://doi.org/10.3389/fpsyg.2015.01491>
- Fredrickson, B. L. (2004a). Gratitude, Like Other Positive Emotions, Broadens and Builds. In *The Psychology of Gratitude* (pp. 144–166). Oxford University Press. <https://doi.org/10.1093/acprof:oso/9780195150100.003.0008>

- Fredrickson, B. L. (2004b). The broaden-and-build theory of positive emotions. *Philosophical Transactions of the Royal Society B: Biological Sciences*, 359(1449), 1367–1377. <https://doi.org/10.1098/rstb.2004.1512>
- Frias, A., Watkins, P. C., Webber, A. C., & Froh, J. J. (2011). Death and gratitude: Death reflection enhances gratitude. *The Journal of Positive Psychology*, 6(2), 154–162. <https://doi.org/10.1080/17439760.2011.558848>
- Froh, J. J., Bono, G., & Emmons, R. A. (2010). Being grateful is beyond good manners: Gratitude and motivation to contribute to society among early adolescents. *Motivation and Emotion*, 34(2), 144–157. <https://doi.org/10.1007/s11031-010-9163-z>
- Froh, J. J., Bono, G., Fan, J., Emmons, R. A., Henderson, K., Harris, C., ... Wood, A. M. (2014). Nice thinking! An educational intervention that teaches children to think gratefully. *School Psychology Review*, 43(2), 132–152. <http://dx.doi.org/10.1037/e637202012-001>
- Froh, J. J., Emmons, R. A., Card, N. A., Bono, G., & Wilson, J. A. (2011). Gratitude and the Reduced Costs of Materialism in Adolescents. *Journal of Happiness Studies*, 12(2), 289–302. <https://doi.org/10.1007/s10902-010-9195-9>
- Froh, J. J., Fan, J., Emmons, R. A., Bono, G., Huebner, E. S., & Watkins, P. C. (2011). Measuring gratitude in youth: Assessing the psychometric properties of adult gratitude scales in children and adolescents. *Psychological Assessment*, 23(2), 311–324. <https://doi.org/10.1037/a0021590>
- Froh, J. J., Kashdan, T. B., Ozimkowski, K. M., & Miller, N. (2009). Who benefits the most from a gratitude intervention in children and adolescents? Examining positive affect as a moderator. *The Journal of Positive Psychology*, 4(5), 408–422. <https://doi.org/10.1080/17439760902992464>
- Froh, J. J., Sefick, W. J., & Emmons, R. A. (2008). Counting blessings in early adolescents: An experimental study of gratitude and subjective well-being. *Journal of School Psychology*, 46(2), 213–233. <https://doi.org/10.1016/j.jsp.2007.03.005>
- Froh, J. J., Yurkewicz, C., & Kashdan, T. B. (2009). Gratitude and subjective well-being in early adolescence: Examining gender differences. *Journal of Adolescence*, 32(3), 633–650. <https://doi.org/10.1016/j.adolescence.2008.06.006>
- Gabana, N. T., Steinfeldt, J. A., Wong, J., & Chung, Y. B. (2017). Gratitude, burnout, and sport satisfaction among college student-athletes: The mediating role of perceived social support. *Journal of Clinical Sport Psychology*, 11(1), 14–33. <https://doi.org/10.1123/jcsp.2016-0011>
- Galvin, R. (2004). Challenging the Need for Gratitude: Comparisons Between Paid and Unpaid Care for Disabled People. *Journal of Sociology*, 40(2), 137–155. <https://doi.org/10.1177/1440783304043453>
- Garland, E. L., Fredrickson, B. L., Kring, A. M., Johnson, D. P., Meyer, P. S., & Penn, D. L. (2010). Upward spirals of positive emotions counter downward spirals of negativity: Insights from the broaden-and-build theory and affective neuroscience on the treatment of emotion dysfunctions and deficits in psychopathology. *Clinical Psychology Review*, 30(7), 849–864. <https://doi.org/10.1016/j.cpr.2010.03.002>
- Geraghty, A. W. A., Wood, A. M., & Hyland, M. E. (2010a). Attrition from self-directed interventions: Investigating the relationship between psychological predictors, intervention content and dropout from a body dissatisfaction intervention. *Social Science and Medicine*, 71(1), 30–37. <https://doi.org/10.1016/j.socscimed.2010.03.007>
- Geraghty, A. W. A., Wood, A. M., & Hyland, M. E. (2010b). Dissociating the facets of hope: Agency and pathways predict dropout from unguided self-help therapy in opposite directions. *Journal of Research in Personality*, 44(1), 155–158. <https://doi.org/10.1016/j.jrp.2009.12.003>
- Gilbert, D. T., King, G., Pettigrew, S., & Wilson, T. D. (2016). Comment on “Estimating the reproducibility of psychological science.” *Science*, 351(6277), 1037–1037. <https://doi.org/10.1126/science.aad7243>
- Gino, F., & Schweitzer, M. E. (2008). Blinded by anger or feeling the love: how emotions influence advice taking. *The Journal of Applied Psychology*, 93(5), 1165–1173. <https://doi.org/10.1037/0021-9010.93.5.1165>
- Gleason, J. B., & Weintraub, S. (1976). The acquisition of routines in child language. *Language in Society*, 5(2), 129–136. <https://doi.org/10.1017/S0047404500006977>
- Goei, R., & Boster, F. J. (2005). The Roles of Obligation and Gratitude in Explaining the Effect of Favors on Compliance. *Communication Monographs*, 72(3), 284–300. <https://doi.org/10.1080/03637750500206524>
- Gordon, A. M., Impett, E. A., Kogan, A., Oveis, C., & Keltner, D. (2012). To have and to hold: Gratitude promotes relationship maintenance in intimate bonds. *Journal of Personality and Social Psychology*, 103(2), 257–274. <https://doi.org/10.1037/a0028723>
- Gordon, C. L., Arnette, R. A. M., & Smith, R. E. (2011). Have you thanked your spouse today?: Felt and expressed gratitude among married couples. *Personality and Individual Differences*, 50(3), 339–343. <https://doi.org/10.1016/j.paid.2010.10.012>
- Gouldner, A. W. (1960). The Norm of Reciprocity: A Preliminary Statement. *American Sociological Review*, 25(2), 161. <https://doi.org/10.2307/2092623>
- Graham, S. (1988). Children’s developing understanding of the motivational role of affect: An attributional analysis. *Cognitive Development*, 3(1), 71–88. [https://doi.org/10.1016/0885-2014\(88\)90031-7](https://doi.org/10.1016/0885-2014(88)90031-7)

- Grant, A. M., & Gino, F. (2010). A little thanks goes a long way: Explaining why gratitude expressions motivate prosocial behavior. *Journal of Personality and Social Psychology*, 98(6), 946–955. <https://doi.org/10.1037/a0017935>
- Grant, A. M., & Wrzesniewski, A. (2010). I won't let you down... or will I? Core self-evaluations, other-orientation, anticipated guilt and gratitude, and job performance. *Journal of Applied Psychology*, 95(1), 108–121. <https://doi.org/10.1037/a0017974>
- Griffin, B. J., Garthe, R. C., Worthington, E. L. J., Sullivan, T. N., Larsen, R., Lavelock, C. R., & Davis, D. E. (2016). How positive processes function in negative relationships: Dispositional gratitude moderates the association between affective need and frequency of dating violence victimization. *The Journal of Positive Psychology*, 11(4), 388–398. <https://doi.org/10.1080/17439760.2015.1117124>
- Haidt, J. (2000). The Positive emotion of elevation. *Prevention & Treatment*, 3(1), 1–5. <https://doi.org/10.1037/1522-3736.3.1.33c>
- Halberstadt, A. G., Langley, H. A., Hussong, A. M., Rothenberg, W. A., Coffman, J. L., Mokrova, I., & Costanzo, P. R. (2016). Parents' understanding of gratitude in children: A thematic analysis. *Early Childhood Research Quarterly*, 36, 439–451. <https://doi.org/10.1016/j.ecresq.2016.01.014>
- Harbaugh, C. N., & Vasey, M. W. (2014). When do people benefit from gratitude practice? *The Journal of Positive Psychology*, 9(6), 535–546. <https://doi.org/10.1080/17439760.2014.927905>
- Heider, F. (1958). *The Psychology of Interpersonal Relations*. New York: Wiley.
- Hill, P. L., & Allemand, M. (2011). Gratitude, forgivingness, and well-being in adulthood: Tests of moderation and incremental prediction. *The Journal of Positive Psychology*, 6(5), 397–407. <https://doi.org/10.1080/17439760.2011.602099>
- Hill, P. L., Allemand, M., & Roberts, B. W. (2013). Examining the pathways between gratitude and self-rated physical health across adulthood. *Personality and Individual Differences*, 54(1), 92–96. <https://doi.org/10.1016/j.paid.2012.08.011>
- Hlava, P., & Elfers, J. (2013). The Lived Experience of Gratitude. *Journal of Humanistic Psychology*, 54(4), 434–455. <https://doi.org/10.1177/0022167813508605>
- Hlava, P., Elfers, J., & Offringa, R. (2014). A transcendent view of gratitude: The transpersonal gratitude scale. *International Journal of Transpersonal Studies*, 33(1), 1–14.
- Homan, K. J., Sedlak, B. L., & Boyd, E. A. (2014). Gratitude buffers the adverse effect of viewing the thin ideal on body dissatisfaction. *Body Image*, 11(3), 245–250. <https://doi.org/10.1016/j.bodyim.2014.03.005>
- Hoy, B. D., Suldo, S. M., & Mendez, L. R. (2013). Links Between Parents' and Children's Levels of Gratitude, Life Satisfaction, and Hope. *Journal of Happiness Studies*, 14(4), 1343–1361. <https://doi.org/10.1007/s10902-012-9386-7>
- Huffman, J. C., Beale, E. E., Celano, C. M., Beach, S. R., Belcher, A. M., Moore, S. V., ... Januzzi, J. L. (2016). Effects of Optimism and Gratitude on Physical Activity, Biomarkers, and Readmissions after an Acute Coronary Syndrome: The Gratitude Research in Acute Coronary Events Study. *Circulation: Cardiovascular Quality and Outcomes*, 9(1), 55–63. <https://doi.org/10.1161/CIRCOUTCOMES.115.002184>
- Huffman, J. C., DuBois, C. M., Healy, B. C., Boehm, J. K., Kashdan, T. B., Celano, C. M., ... Lyubomirsky, S. (2014). Feasibility and utility of positive psychology exercises for suicidal inpatients. *General Hospital Psychiatry*, 36(1), 88–94. <https://doi.org/10.1016/j.genhosppsych.2013.10.006>
- Hussong, A. M., Langley, H. A., Coffman, J. L., Halberstadt, A. G., & Costanzo, P. R. (2017). Parent Socialization of Children's Gratitude. In J. R. H. Tudge & L. B. L. Freitas (Eds.), *Developing Gratitude in Children and Adolescents*. Cambridge University Press.
- Ide, R. (1998). "Sorry for your kindness": Japanese interactional ritual in public discourse. *Journal of Pragmatics*, 29(5), 509–529. [https://doi.org/10.1016/S0378-2166\(98\)80006-4](https://doi.org/10.1016/S0378-2166(98)80006-4)
- Ioannidis, J. P. A. (2005). Why most published research findings are false. *PLoS Medicine*, 2(8), 0696–0701. <https://doi.org/10.1371/journal.pmed.0020124>
- Israel-Cohen, Y., Uzefovsky, F., Kashy-Rosenbaum, G., & Kaplan, O. (2015). Gratitude and PTSD symptoms among Israeli youth exposed to missile attacks: examining the mediation of positive and negative affect and life satisfaction. *The Journal of Positive Psychology*, 10(2), 99–106. <https://doi.org/10.1080/17439760.2014.927910>
- Jackowska, M., Brown, J., Ronaldson, A., & Steptoe, A. (2016). The impact of a brief gratitude intervention on subjective well-being, biology and sleep. *Journal of Health Psychology*, 21(10), 2207–17. <https://doi.org/10.1177/1359105315572455>
- Jackson, L. (2016). Why should I be grateful? The morality of gratitude in contexts marked by injustice. *Journal of Moral Education*, 45(3), 276–290. <https://doi.org/10.1080/03057240.2016.1186612>
- Jia, L., Lee, L. N., & Tong, E. M. W. (2015). Gratitude facilitates behavioral mimicry. *Emotion*, 15(2), 134–138. <https://doi.org/10.1037/emo0000022>

- Jia, L., Tong, E. M. W., & Lee, L. N. (2014). Psychological “gel” to bind individuals’ goal pursuit: Gratitude facilitates goal contagion. *Emotion*, 14(4), 748–760. <https://doi.org/10.1037/a0036407>
- Joel, S., Gordon, A. M., Impett, E. A., MacDonald, G., & Keltner, D. (2013). The Things You Do for Me. *Personality and Social Psychology Bulletin*, 39(10), 1333–1345. <https://doi.org/10.1177/0146167213497801>
- Kaczmarek, L. D., Goodman, F. R., Drazkowski, D., Kashdan, T. B., Połatyńska, K., & Komorek, J. (2014). Instructional support decreases desirability and initiation of a gratitude intervention. *Personality and Individual Differences*, 64, 89–93. <https://doi.org/10.1016/j.paid.2014.02.022>
- Kaczmarek, L. D., Kashdan, T. B., Drazkowski, D., Bujacz, A., & Goodman, F. R. (2014). Why do greater curiosity and fewer depressive symptoms predict gratitude intervention use? Utility beliefs, social norm, and self-control beliefs. *Personality and Individual Differences*, 66, 165–170. <https://doi.org/10.1016/j.paid.2014.03.032>
- Kaczmarek, L. D., Kashdan, T. B., Drazkowski, D., Enko, J., Kosakowski, M., Szäefer, A., & Bujacz, A. (2015). Why do people prefer gratitude journaling over gratitude letters? The influence of individual differences in motivation and personality on web-based interventions. *Personality and Individual Differences*, 75, 1–6. <https://doi.org/10.1016/j.paid.2014.11.004>
- Kaczmarek, L. D., Kashdan, T. B., Kleiman, E. M., Baczkowski, B., Enko, J., Siebers, A., ... Baran, B. (2013). Who self-initiates gratitude interventions in daily life? An examination of intentions, curiosity, depressive symptoms, and life satisfaction. *Personality and Individual Differences*, 55(7), 805–810. <https://doi.org/10.1016/j.paid.2013.06.013>
- Kaplan, S., Bradley-Geist, J. C., Ahmad, A., Anderson, A., Hargrove, A. K., & Lindsey, A. (2014). A Test of Two Positive Psychology Interventions to Increase Employee Well-Being. *Journal of Business and Psychology*, 29(3), 367–380. <https://doi.org/10.1007/s10869-013-9319-4>
- Karns, C. M., Moore, W. E. I., & Mayr, U. (2017). The Cultivation of Pure Altruism via Gratitude: A functional MRI Study of Change with Gratitude Practice. *Frontiers in Human Neuroscience*, 11(December), 599. <https://doi.org/10.3389/FNHUM.2017.00599>
- Kashdan, T. B., Mishra, A., Breen, W. E., & Froh, J. J. (2009). Gender differences in gratitude: Examining appraisals, narratives, the willingness to express emotions, and changes in psychological needs. *Journal of Personality*, 77(3), 691–730. <https://doi.org/10.1111/j.1467-6494.2009.00562.x>
- Kashdan, T. B., Uswatte, G., & Julian, T. (2006). Gratitude and hedonic and eudaimonic well-being in Vietnam war veterans. *Behaviour Research and Therapy*, 44(2), 177–199. <https://doi.org/10.1016/j.brat.2005.01.005>
- Kerr, S. L., O’Donovan, A., & Pepping, C. A. (2014). Can Gratitude and Kindness Interventions Enhance Well-Being in a Clinical Sample? *Journal of Happiness Studies*, 16(1), 17–36. <https://doi.org/10.1007/s10902-013-9492-1>
- Khanna, P., & Singh, K. (2016). Effect of Gratitude Educational Intervention on Well-Being Indicators Among North Indian Adolescents. *Contemporary School Psychology*, 20(4), 305–314. <https://doi.org/10.1007/s40688-016-0087-9>
- Killen, A., & Macaskill, A. (2015). Using a Gratitude Intervention to Enhance Well-Being in Older Adults. *Journal of Happiness Studies*, 16(4), 947–964. <https://doi.org/10.1007/s10902-014-9542-3>
- Kini, P., Wong, J., McInnis, S., Gabana, N. T., & Brown, J. W. (2016). The effects of gratitude expression on neural activity. *NeuroImage*, 128, 1–10. <https://doi.org/10.1016/j.neuroimage.2015.12.040>
- Kleiman, E. M., Adams, L. M., Kashdan, T. B., & Riskind, J. H. (2013). Gratitude and Grit Indirectly Reduce Risk of Suicidal Ideations by Enhancing Meaning in Life : Evidence for a Mediated Moderation Model *Journal of Research in Personality*, 47(October 2013), 539–546. <https://doi.org/10.1016/j.jrp.2013.04.007>
- Klein, R. A., Ratliff, K. A., Vianello, M., Adams, R. B., Bahník, Š., Bernstein, M. J., ... Nosek, B. A. (2014). Investigating variation in replicability: A “many labs” replication project. *Social Psychology*, 45(3), 142–152. <https://doi.org/10.1027/1864-9335/a000178>
- Kong, F., Ding, K., & Zhao, J. (2015). The Relationships Among Gratitude, Self-esteem, Social Support and Life Satisfaction Among Undergraduate Students. *Journal of Happiness Studies*, 16(2), 477–489. <https://doi.org/10.1007/s10902-014-9519-2>
- König, S., & Glück, J. (2014). “Gratitude is with me all the time”: How gratitude relates to wisdom. *Journals of Gerontology - Series B Psychological Sciences and Social Sciences*, 69(5), 655–666. <https://doi.org/10.1093/geronb/gbt123>
- Koo, M., Algoe, S. B., Wilson, T. D., & Gilbert, D. T. (2008). It’s a wonderful life: Mentally subtracting positive events improves people’s affective states, contrary to their affective forecasts. *Journal of Personality and Social Psychology*, 95(5), 1217–1224. <https://doi.org/10.1037/a0013316>
- Kraus, R., Desmond, S. A., & Palmer, Z. D. (2015). Being Thankful: Examining the Relationship Between Young Adult Religiosity and Gratitude. *Journal of Religion and Health*, 54(4), 1331–1344. <https://doi.org/10.1007/s10943-014-9923-2>

- Krause, N. (2006). Gratitude Toward God, Stress, and Health in Late Life. *Research on Aging*, 28(2), 163–183. <https://doi.org/10.1177/0164027505284048>
- Krause, N. (2009). Religious Involvement, Gratitude, and Change in Depressive Symptoms Over Time. *International Journal for the Psychology of Religion*, 19(3), 155–172. <https://doi.org/10.1080/10508610902880204>
- Krause, N., Emmons, R. A., Ironson, G., & Hill, P. C. (2017). General feelings of gratitude, gratitude to god, and hemoglobin A1c: Exploring variations by gender. *The Journal of Positive Psychology*, 12(6), 639–650. <https://doi.org/10.1080/17439760.2017.1326520>
- Krause, N., & Hayward, R. D. (2014). Hostility, Religious Involvement, Gratitude, and Self-Rated Health in Late Life. *Research on Aging*, 36(6), 731–752. <https://doi.org/10.1177/0164027513519113>
- Krentzman, A. R. (2017). Gratitude, abstinence, and alcohol use disorders: Report of a preliminary finding. *Journal of Substance Abuse Treatment*, 78, 30–36. <https://doi.org/10.1016/j.jsat.2017.04.013>
- Krumrei-Mancuso, E. J. (2017). Intellectual humility and prosocial values: Direct and mediated effects. *The Journal of Positive Psychology*, 12(1), 13–28. <https://doi.org/10.1080/17439760.2016.1167938>
- Kruse, E., Chancellor, J., Ruberton, P. M., & Lyubomirsky, S. (2014). An Upward Spiral Between Gratitude and Humility. *Social Psychological and Personality Science*, 5(7), 805–814. <https://doi.org/10.1177/1948550614534700>
- Kubacka, K. E., Finkenauer, C., Rusbult, C. E., & Keijsers, L. (2011). Maintaining Close Relationships. *Personality and Social Psychology Bulletin*, 37(10), 1362–1375. <https://doi.org/10.1177/0146167211412196>
- Lambert, N. M., Clark, M. S., Durtschi, J., Fincham, F. D., & Graham, S. M. (2010). Benefits of Expressing Gratitude. *Psychological Science*, 21(4), 574–580. <https://doi.org/10.1177/0956797610364003>
- Lambert, N. M., & Fincham, F. D. (2011). Expressing gratitude to a partner leads to more relationship maintenance behavior. *Emotion*, 11(1), 52–60. <https://doi.org/10.1037/a0021557>
- Lambert, N. M., Fincham, F. D., Braithwaite, S. R., Graham, S. M., & Beach, S. R. H. (2009). Can prayer increase gratitude? *Psychology of Religion and Spirituality*, 1(3), 139–149. <https://doi.org/10.1037/a0016731>
- Lambert, N. M., Fincham, F. D., & Stillman, T. F. (2012). Gratitude and depressive symptoms: The role of positive reframing and positive emotion. *Cognition & Emotion*, 26(4), 615–633. <https://doi.org/10.1080/02699931.2011.595393>
- Lambert, N. M., Fincham, F. D., Stillman, T. F., & Dean, L. R. (2009). More gratitude, less materialism: The mediating role of life satisfaction. *The Journal of Positive Psychology*, 4(1), 32–42. <https://doi.org/10.1080/17439760802216311>
- Lambert, N. M., Graham, S. M., & Fincham, F. D. (2009). A prototype analysis of gratitude: varieties of gratitude experiences. *Personality and Social Psychology Bulletin*, 35(9), 1193–1207. <https://doi.org/10.1177/0146167209338071>
- Lane, J., & Anderson, N. H. (1976). Integration of intention and outcome in moral judgment. *Memory & Cognition*, 4(1), 1–5. <https://doi.org/10.3758/BF03213247>
- Lanham, Michelle, E., Rye, Mark, S., Rimsky, Liza, S., & Weill, S. R. (2012). How Gratitude Relates to Burnout and Job Satisfaction in Mental Health Professionals. *Journal of Mental Health Counseling*, 34(4), 341–354. <https://doi.org/10.17744/mehc.34.4.w35q80w11kgpqn26>
- Lavelock, C. R., Griffin, B. J., Worthington, E. L., Benotsch, E. G., Lin, Y., Greer, C. L., ... Hook, J. N. (2016). A qualitative review and integrative model of gratitude and physical health. *Journal of Psychology and Theology*, 44(1), 55–86. <https://doi.org/10.1177/009164711604400105>
- Layous, K., Lee, H., Choi, I., & Lyubomirsky, S. (2013). Culture Matters When Designing a Successful Happiness-Increasing Activity: A Comparison of the United States and South Korea. *Journal of Cross-Cultural Psychology*, 44(8), 1294–1303. <https://doi.org/10.1177/0022022113487591>
- Layous, K., & Lyubomirsky, S. (2014). Benefits, Mechanisms, and New Directions for Teaching Gratitude to Children. *School Psychology Review*, 43(2), 153–159.
- Layous, K., Nelson, S. K., Kurtz, J. L., & Lyubomirsky, S. (2017). What triggers prosocial effort? A positive feedback loop between positive activities, kindness, and well-being. *The Journal of Positive Psychology*, 12(4), 385–398. <https://doi.org/10.1080/17439760.2016.1198924>
- Layous, K., Sweeny, K., Armenta, C., Na, S., Choi, I., & Lyubomirsky, S. (2017). The proximal experience of gratitude. *PLoS ONE*, 12(7), 1–26. <https://doi.org/10.1371/journal.pone.0179123>
- Lazarus, R. S., & Lazarus, B. N. (1994). *Passion and Reason: Making Sense of Our Emotions*. New York: Oxford University Press.
- Lee, L., Tong, E. M. W., & Sim, D. (2015). The dual upward spirals of gratitude and basic psychological needs. *Motivation Science*, 1(2), 87–97. <https://doi.org/10.1037/mot0000018>
- Leung, C. C., & Tong, E. M. W. (2017). Gratitude and Drug Misuse: Role of Coping as Mediator. *Substance Use and Misuse*, 52(14), 1832–1839. <https://doi.org/10.1080/10826084.2017.1312449>

- Li, D., Zhang, W., Li, X., Li, N., & Ye, B. (2012). Gratitude and suicidal ideation and suicide attempts among Chinese Adolescents: Direct, mediated, and moderated effects. *Journal of Adolescence*, 35(1), 55–66. <https://doi.org/10.1016/j.adolescence.2011.06.005>
- Lies, J., Mellor, D., & Hong, R. Y. (2014). Gratitude and personal functioning among earthquake survivors in Indonesia. *The Journal of Positive Psychology*, 9(4), 295–305. <https://doi.org/10.1080/17439760.2014.902492>
- Lin, C.-C. (2014). A higher-Order Gratitude Uniquely Predicts Subjective Well-Being: Incremental Validity Above the Personality and a Single Gratitude. *Social Indicators Research*, 119(2), 909–924. <https://doi.org/10.1007/s11205-013-0518-1>
- Lin, C.-C. (2015). Self-esteem mediates the relationship between dispositional gratitude and well-being. *Personality and Individual Differences*, 85(October), 145–148. <https://doi.org/10.1016/j.paid.2015.04.045>
- Liu, J., Gong, P., Gao, X., & Zhou, X. (2017). The association between well-being and the COMT gene: Dispositional gratitude and forgiveness as mediators. *Journal of Affective Disorders*, 214(March), 115–121. <https://doi.org/10.1016/j.jad.2017.03.005>
- Lomas, T., Froh, J. J., Emmons, R. A., Mishra, A., & Bono, G. (2014). Gratitude Interventions A Review and Future Agenda. In A. C. Parks & S. M. Schueller (Eds.), *The Wiley Blackwell Handbook of Positive Psychological Interventions* (First Edit, pp. 1–19). John Wiley & Sons, Ltd. <https://doi.org/10.1002/9781118315927.fmatter>
- Lyubomirsky, S., Dickerhoof, R., Boehm, J. K., & Sheldon, K. M. (2011). Becoming happier takes both a will and a proper way: An experimental longitudinal intervention to boost well-being. *Emotion*, 11(2), 391–402. <https://doi.org/10.1037/a0022575>
- Lyubomirsky, S., Sheldon, K. M., & Schkade, D. (2005). Pursuing happiness: The architecture of sustainable change. *Review of General Psychology*, 9(2), 111–131. <https://doi.org/10.1037/1089-2680.9.2.111>
- Ma, L. K., Tunney, R. J., & Ferguson, E. (2017). Does gratitude enhance prosociality?: A meta-analytic review. *Psychological Bulletin*, 143(6), 601–635. <https://doi.org/10.1037/bul0000103>
- Ma, M., Kibler, J. L., & Sly, K. (2013). Gratitude is associated with greater levels of protective factors and lower levels of risks in African American adolescents. *Journal of Adolescence*, 36(5), 983–991. <https://doi.org/10.1016/j.adolescence.2013.07.012>
- MacKenzie, M. J., Vohs, K. D., & Baumeister, R. F. (2014). You Didn't Have to Do That. *Personality and Social Psychology Bulletin*, 40(11), 1423–1434. <https://doi.org/10.1177/0146167214549322>
- Malin, H., Liauw, I., & Damon, W. (2017). Purpose and Character Development in Early Adolescence. *Journal of Youth and Adolescence*, 46(6), 1200–1215. <https://doi.org/10.1007/s10964-017-0642-3>
- Manela, T. (2015). Gratitude. In E. N. Zalta (Ed.), *The Stanford Encyclopedia of Philosophy* (Spring 2015). Retrieved from <https://plato.stanford.edu/archives/spr2015/entries/gratitude/>
- Marszalek, J. M., Barber, C., Kohlhart, J., & Cooper, B. H. (2011). Sample Size in Psychological Research over the Past 30 Years. *Perceptual and Motor Skills*, 112(2), 331–348. <https://doi.org/10.2466/03.11.PMS.112.2.331-348>
- Mathews, M. A., & Green, J. D. (2010). Looking at me, appreciating you: Self-focused attention distinguishes between gratitude and indebtedness. *Cognition & Emotion*, 24(4), 710–718. <https://doi.org/10.1080/02699930802650796>
- Mauss, I. B., Tamir, M., Anderson, C. L., & Savino, N. S. (2011). Can seeking happiness make people unhappy? Paradoxical effects of valuing happiness. *Emotion*, 11(4), 807–815. <https://doi.org/10.1037/a0022010>
- McCraty, R., Atkinson, M., & Tiller, W. (1995). The Effects of Emotions on Short-Term Power Spectrum Analysis of Heart Rate Variability. *The American Journal of Cardiology*.
- McCullough, M. E., Emmons, R. A., & Tsang, J.-A. (2002). The grateful disposition: A conceptual and empirical topography. *Journal of Personality and Social Psychology*, 82(1), 112–127. <https://doi.org/10.1037/0022-3514.82.1.112>
- McCullough, M. E., Kilpatrick, S. D., Emmons, R. A., & Larson, D. B. (2001). Is gratitude a moral affect? *Psychological Bulletin*, 127(2), 249–266. <https://doi.org/10.1037/0033-2909.127.2.249>
- McCullough, M. E., Kimeldorf, M. B., & Cohen, A. D. (2008). An adaptation for altruism? *Current Directions in Psychological Science*, 17(4), 281–285. <https://doi.org/10.1111/j.1467-8721.2008.00590.x>
- McCullough, M. E., Tsang, J.-A., & Emmons, R. A. (2004). Gratitude in Intermediate Affective Terrain: Links of Grateful Moods to Individual Differences and Daily Emotional Experience. *Journal of Personality and Social Psychology*, 86(2), 295–309. <https://doi.org/10.1037/0022-3514.86.2.295>
- McWilliams, N., & Lependorf, S. (1990). Narcissistic pathology of everyday life: The denial of remorse and gratitude. *Contemporary Psychoanalysis*, 26(3), 430–451. <https://doi.org/10.1080/00107530.1990.10746671>
- Michie, S. (2009). Pride and Gratitude. *Journal of Leadership & Organizational Studies*, 15(4), 393–403. <https://doi.org/10.1177/1548051809333338>

- Mills, P. J., Redwine, L. S., Wilson, K., Pung, M. A., Chinh, K., Greenberg, B. H., ... Chopra, D. (2015). The role of gratitude in spiritual well-being in asymptomatic heart failure patients. *Spirituality in Clinical Practice*, 2(1), 5–17. <https://doi.org/10.1037/scp0000050>
- Millstein, R. A., Celano, C. M., Beale, E. E., Beach, S. R., Suarez, L., Belcher, A. M., ... Huffman, J. C. (2016). The effects of optimism and gratitude on adherence, functioning and mental health following an acute coronary syndrome. *General Hospital Psychiatry*, 43, 17–22. <https://doi.org/10.1016/j.genhosppsych.2016.08.006>
- Mofidi, T., El-Alayli, A., & Brown, A. A. (2014). Trait Gratitude and Grateful Coping as They Relate to College Student Persistence, Success, and Integration in School. *Journal of College Student Retention: Research, Theory & Practice*, 16(3), 325–349. <https://doi.org/10.2190/CS.16.3.b>
- Morgan, B., Gulliford, L., & Carr, D. (2015). Educating gratitude: Some conceptual and moral misgivings. *Journal of Moral Education*, 44(1), 97–111. <https://doi.org/10.1080/03057240.2014.1002461>
- Morgan, B., Gulliford, L., & Kristjánsson, K. (2014). Gratitude in the UK: A new prototype analysis and a cross-cultural comparison. *The Journal of Positive Psychology*, 9(4), 281–294. <https://doi.org/10.1080/17439760.2014.898321>
- Morgan, B., Gulliford, L., & Kristjánsson, K. (2017). A new approach to measuring moral virtues: The Multi-Component Gratitude Measure. *Personality and Individual Differences*, 107, 179–189. <https://doi.org/10.1016/j.paid.2016.11.044>
- Nelson, C. (2009). Appreciating gratitude: Can gratitude be used as a psychological intervention to improve individual well-being? *Counselling Psychology Review*, 24(3–4), 38–50.
- Nelson, J. A., de Lucca Freitas, L. B., O'Brien, M., Calkins, S. D., Leerkes, E. M., & Marcovitch, S. (2013). Preschool-aged children's understanding of gratitude: Relations with emotion and mental state knowledge. *British Journal of Developmental Psychology*, 31(1), 42–56. <https://doi.org/10.1111/j.2044-835X.2012.02077.x>
- Neto, F. (2007). Forgiveness, personality and gratitude. *Personality and Individual Differences*, 43(8), 2313–2323. <https://doi.org/10.1016/j.paid.2007.07.010>
- Nezlek, J. B., Newman, D. B., & Thrash, T. M. (2017). A daily diary study of relationships between feelings of gratitude and well-being. *The Journal of Positive Psychology*, 12(4), 323–332. <https://doi.org/10.1080/17439760.2016.1198923>
- Ng, M.-Y., & Wong, W.-S. (2013). The differential effects of gratitude and sleep on psychological distress in patients with chronic pain. *Journal of Health Psychology*, 18(2), 263–271. <http://dx.doi.org/10.1177/1359105312439733>
- Ng, W. (2016). Use of positive interventions: Does neuroticism moderate the sustainability of their effects on happiness? *The Journal of Positive Psychology*, 11(1), 51–61. <https://doi.org/10.1080/17439760.2015.1025419>
- Nowak, M. A., & Roch, S. (2007). Upstream reciprocity and the evolution of gratitude. *Proceedings of the Royal Society B: Biological Sciences*, 274(1610), 605–610. <https://doi.org/10.1098/rspb.2006.0125>
- O'Connell, B. H., O'Shea, D., & Gallagher, S. (2016). Enhancing social relationships through positive psychology activities: a randomised controlled trial. *The Journal of Positive Psychology*, 11(2), 149–162. <https://doi.org/10.1080/17439760.2015.1037860>
- Open Science Collaboration. (2015). Estimating the reproducibility of psychological science. *Science*, 349(6251), aac4716–aac4716. <https://doi.org/10.1126/science.aac4716>
- Ortony, A., Clore, G. L., & Collins, A. (1988). *The Cognitive Structure of Emotions*. Cambridge: Cambridge University Press.
- Otto, A. K., Szczeny, E. C., Soriano, E. C., Laurenceau, J.-P., & Siegel, S. D. (2016). Effects of a randomized gratitude intervention on death-related fear of recurrence in breast cancer survivors. *Health Psychology*, 35(12), 1320–1328. <https://doi.org/10.1037/hea0000400>
- Panagopoulos, C. (2011). Thank You for Voting: Gratitude Expression and Voter Mobilization. *The Journal of Politics*, 73(3), 707–717. <https://doi.org/10.1017/S0022381611000405>
- Patil, P., Peng, R. D., & Leek, J. T. (2016). What Should Researchers Expect When They Replicate Studies? A Statistical View of Replicability in Psychological Science. *Perspectives on Psychological Science*, 11(4), 539–544. <https://doi.org/10.1177/1745691616646366>
- Peterson, C., Ruch, W., Beermann, U., Park, N., & Seligman, M. E. P. (2007). Strengths of character, orientations to happiness, and life satisfaction. *The Journal of Positive Psychology*, 2(3), 149–156. <https://doi.org/10.1080/17439760701228938>
- Petrocchi, N., & Couyoumdjian, A. (2016). The impact of gratitude on depression and anxiety: the mediating role of criticizing, attacking, and reassuring the self. *Self and Identity*, 15(2), 191–205. <https://doi.org/10.1080/15298868.2015.1095794>
- Polak, E. L., & McCullough, M. E. (2006). Is gratitude an alternative to materialism? *Journal of Happiness Studies*, 7(3), 343–360. <https://doi.org/10.1007/s10902-005-3649-5>
- Raggio, R. D., & Folse, J. A. G. (2011). Expressions of Gratitude in Disaster Management: An Economic, Social Marketing, and Public Policy Perspective on Post-Katrina Campaigns. *Journal of Public Policy & Marketing*, 30(2), 168–174. <https://doi.org/10.1509/jppm.30.2.168>

- Rash, J. A., Matsuba, M. K., & Prkachin, K. M. (2011). Gratitude and well-being: Who benefits the most from a gratitude intervention? *Applied Psychology: Health and Well-Being*, 3(3), 350–369. <https://doi.org/10.1111/j.1758-0854.2011.01058.x>
- Reckart, H., Huebner, E. S., Hills, K. J., & Valois, R. F. (2017). A preliminary study of the origins of early adolescents' gratitude differences. *Personality and Individual Differences*, 116, 44–50. <https://doi.org/10.1016/j.paid.2017.04.020>
- Redwine, L. S., Henry, B. L., Pung, M. A., Wilson, K., Chinh, K., Knight, B., ... Mills, P. J. (2016). Pilot Randomized Study of a Gratitude Journaling Intervention on Heart Rate Variability and Inflammatory Biomarkers in Patients With Stage B Heart Failure. *Psychosomatic Medicine*, 78(6), 667–676. <https://doi.org/10.1097/PSY.0000000000000316>
- Renshaw, T. L., & Olinger Steeves, R. M. (2016). What good is gratitude in youth and schools? A systematic review and meta-analysis of correlates and intervention outcomes. *Psychology in the Schools*, 53(3), 286–305. <https://doi.org/10.1002/pits.21903>
- Roberts, J. A., Tsang, J.-A., & Manolis, C. (2015). Looking for happiness in all the wrong places: The moderating role of gratitude and affect in the materialism–life satisfaction relationship. *The Journal of Positive Psychology*, 10(6), 489–498. <https://doi.org/10.1080/17439760.2015.1004553>
- Rosenberg, E. L. (1998). Levels of analysis and the organization of affect. *Review of General Psychology*, 2(3), 247–270. <https://doi.org/10.1037/1089-2680.2.3.247>
- Rosmarin, D. H., Pirutinsky, S., Cohen, A. B., Galler, Y., & Krumrei, E. J. (2011). Grateful to God or just plain grateful? A comparison of religious and general gratitude. *The Journal of Positive Psychology*, 6(5), 389–396. <https://doi.org/10.1080/17439760.2011.596557>
- Rothenberg, W. A., Hussong, A. M., Langley, H. A., Egerton, G. A., Halberstadt, A. G., Coffman, J. L., ... Costanzo, P. R. (2017). Grateful parents raising grateful children: Niche selection and the socialization of child gratitude. *Applied Developmental Science*, 21(2), 106–120. <https://doi.org/10.1080/10888691.2016.1175945>
- Rothenberg, W. A., Pirutinsky, S., Greer, D., & Korbman, M. (2015). Maintaining a Grateful Disposition in the Face of Distress: The Role of Religious Coping. *Psychology of Religion and Spirituality*, 8(2), 134–140. <https://doi.org/10.1037/rel0000021>
- Rotkirch, A., Lyons, M., David-Barrett, T., & Jokela, M. (2014). Gratitude for Help among Adult Friends and Siblings. *Evolutionary Psychology*, 12(4), 147470491401200. <https://doi.org/10.1177/147470491401200401>
- Ruberton, P. M., Kruse, E., & Lyubomirsky, S. (2016). Boosting State Humility Via Gratitude, Self-Affirmation, and Awe: Theoretical and Empirical Perspectives. In E. Worthington, D. Davis, & J. Hook (Eds.), *Handbook of humility*. New York: Routledge.
- Ruch, W., Gander, F., Platt, T., & Hofmann, J. (2016). Team roles: Their relationships to character strengths and job satisfaction. *Journal of Positive Psychology*, 13(2), 190–199. <https://doi.org/10.1080/17439760.2016.1257051>
- Ruini, C., & Vescovelli, F. (2013). The Role of Gratitude in Breast Cancer: Its Relationships with Post-traumatic Growth, Psychological Well-Being and Distress. *Journal of Happiness Studies*, 14(1), 263–274. <https://doi.org/10.1007/s10902-012-9330-x>
- Rye, M. S., Fleri, A. M., Moore, C. D., Worthington, E. L., Wade, N. G., Sandage, S. J., & Cook, K. M. (2012). Evaluation of an Intervention Designed to Help Divorced Parents Forgive Their Ex-Spouse. *Journal of Divorce and Remarriage*, 53(3), 231–245. <https://doi.org/10.1080/10502556.2012.663275>
- Sansone, R. A., & Sansone, L. A. (2010). Gratitude and well being: the benefits of appreciation. *Psychiatry*, 7(11), 18–22.
- Saucier, G., & Goldberg, L. R. (1998). What is beyond the big five? *Journal of Personality*, 66(4), 495–524. <https://doi.org/10.1111/1467-6494.00022>
- Schwartz, B. (1967). The Social psychology of the gift. *American Journal of Sociology*, 73(1), 1–11. <https://doi.org/10.1086/224432>
- Seligman, M. E. P., Steen, T. A., Park, N., & Peterson, C. (2005). Positive Psychology Progress: Empirical Validation of Interventions. *American Psychologist*, 60(5), 410–421. <https://doi.org/10.1037/0003-066X.60.5.410>
- Senf, K., & Liau, A. K. (2013). The Effects of Positive Interventions on Happiness and Depressive Symptoms, with an Examination of Personality as a Moderator. *Journal of Happiness Studies*, 14(2), 591–612. <https://doi.org/10.1007/s10902-012-9344-4>
- Sergeant, S., & Mongrain, M. (2011). Are positive psychology exercises helpful for people with depressive personality styles? *Journal of Positive Psychology*, 6(4), 260–272. <https://doi.org/10.1080/17439760.2011.577089>
- Sheldon, K. M., & Lyubomirsky, S. (2006). How to increase and sustain positive emotion: The effects of expressing gratitude and visualizing best possible selves. *Journal of Positive Psychology*, 1(2), 73–82. <https://doi.org/10.1080/17439760500510676>
- Simmel, G. (1950). *The sociology of Georg Simmel*. Glencoe, IL: Free Press.

- Sirois, F. M., & Wood, A. M. (2016). Gratitude uniquely predicts lower depression in chronic illness populations: A longitudinal study of inflammatory bowel disease and arthritis. *Health Psychology, 36*(2), 122–132. <https://doi.org/10.1037/hea0000436>
- Smith, A., Pedersen, E. J., Forster, D. E., McCullough, M. E., & Lieberman, D. (2017). Cooperation: The roles of interpersonal value and gratitude. *Evolution and Human Behavior. https://doi.org/10.1016/j.evolhumbehav.2017.08.003*
- Solom, R., Watkins, P. C., McCurrach, D., & Scheibe, D. (2017). Thieves of thankfulness: Traits that inhibit gratitude. *The Journal of Positive Psychology, 12*(2), 120–129. <https://doi.org/10.1080/17439760.2016.1163408>
- Sommers, S., & Kosmitzki, C. (1988). Emotion and social context: An American-German comparison. *British Journal of Social Psychology, 27*(1), 35–49. <https://doi.org/10.1111/j.2044-8309.1988.tb00803.x>
- Spence, J. R., Brown, D. J., Keeping, L. M., & Lian, H. (2013). Helpful Today, But Not Tomorrow? Feeling Grateful as a Predictor of Daily Organizational Citizenship Behaviors. *Personnel Psychology, 705*–738. <https://doi.org/10.1111/peps.12051>
- Steger, M. F., Hicks, B. M., Kashdan, T. B., Krueger, R. F., & Bouchard, T. J. (2007). Genetic and environmental influences on the positive traits of the values in action classification, and biometric covariance with normal personality. *Journal of Research in Personality, 41*(3), 524–539. <https://doi.org/10.1016/j.jrp.2006.06.002>
- Subandi, M. A., Achmad, T., Kurniati, H., & Febri, R. (2014). Spirituality, gratitude, hope and post-traumatic growth among the survivors of the 2010 eruption of Mount Merapi in Java, Indonesia. *Australasian Journal of Disaster and Trauma Studies, 18*(1), 19–26.
- Suchak, M., Eppley, T. M., Campbell, M. W., & de Waal, F. B. M. (2014). Ape duos and trios: spontaneous cooperation with free partner choice in chimpanzees. *PeerJ, 2*, e417. <https://doi.org/10.7717/peerj.417>
- Sun, P., Jiang, H., Chu, M., & Qian, F. (2014). Gratitude and School Well-Being Among Chinese University Students: Interpersonal Relationships and Social Support As Mediators. *Social Behavior and Personality: An International Journal, 42*(10), 1689–1698. <https://doi.org/10.2224/sbp.2014.42.10.1689>
- Sun, P., & Kong, F. (2013). Affective Mediators of the Influence of Gratitude on Life Satisfaction in Late Adolescence. *Social Indicators Research, 114*(3), 1361–1369. <https://doi.org/10.1007/s11205-013-0333-8>
- Tesser, A., Gatewood, R., & Driver, M. (1968). Some determinants of gratitude. *Journal of Personality and Social Psychology, 9*(3), 233–236. <https://doi.org/10.1037/h0025905>
- Tian, L., Pi, L., Huebner, E. S., & Du, M. (2016). Gratitude and adolescents' subjective well-being in school: The multiple mediating roles of basic psychological needs satisfaction at school. *Frontiers in Psychology, 7*(SEP), 1–8. <https://doi.org/10.3389/fpsyg.2016.01409>
- Toepfer, S. M., Cichy, K., & Peters, P. (2012). Letters of Gratitude: Further Evidence for Author Benefits. *Journal of Happiness Studies, 13*(1), 187–201. <https://doi.org/10.1007/s10902-011-9257-7>
- Trivers, R. L. (1971). The Evolution of Reciprocal Altruism. *The Quarterly Review of Biology, 46*(1), 35–57. <https://doi.org/10.1086/406755>
- Tsang, J.-A. (2006a). BRIEF REPORT Gratitude and prosocial behaviour: An experimental test of gratitude. *Cognition & Emotion, 20*(1), 138–148. <https://doi.org/10.1080/02699930500172341>
- Tsang, J.-A. (2006b). The effects of helper intention on gratitude and indebtedness. *Motivation and Emotion, 30*(3), 198–204. <https://doi.org/10.1007/s11031-006-9031-z>
- Tsang, J.-A. (2007). Gratitude for small and large favors: A behavioral test. *The Journal of Positive Psychology, 2*(3), 157–167. <https://doi.org/10.1080/17439760701229019>
- Tsang, J.-A., Carpenter, T. P., Roberts, J. A., Frisch, M. B., & Carlisle, R. D. (2014). Why are materialists less happy? The role of gratitude and need satisfaction in the relationship between materialism and life satisfaction. *Personality and Individual Differences, 64*(April), 62–66. <https://doi.org/10.1016/j.paid.2014.02.009>
- Tsang, J.-A., & Martin, S. R. (2017). Four experiments on the relational dynamics and prosocial consequences of gratitude. *The Journal of Positive Psychology, 9760*(October), 1–18. <https://doi.org/10.1080/17439760.2017.1388435>
- Tsang, J.-A., Schulwitz, A., & Carlisle, R. D. (2012). An experimental test of the relationship between religion and gratitude. *Psychology of Religion and Spirituality, 4*(1), 40–55. <https://doi.org/10.1037/a0025632>
- Tudge, J. R. H., Freitas, L. B. L., & O'Brien, L. T. (2016). The Virtue of Gratitude: A Developmental and Cultural Approach. *Human Development, 58*(4–5), 281–300. <https://doi.org/10.1159/000444308>
- Van Dusen, J. P., Tamiyu, M. F., Kashdan, T. B., & Elhai, J. D. (2015). Gratitude, depression and PTSD: Assessment of structural relationships. *Psychiatry Research, 230*(3), 867–870. <https://doi.org/10.1016/j.psychres.2015.11.036>
- Vernon, L. L. (2012). Relationships among Proactive Coping, Posttrauma Gratitude, and Psychopathology in a Traumatized College Sample. *Journal of Aggression, Maltreatment & Trauma, 21*(1), 114–130. <https://doi.org/10.1080/10926771.2012.633298>

- Vernon, L. L., Dillon, J. M., & Steiner, A. R. W. (2009). Proactive coping, gratitude, and posttraumatic stress disorder in college women. *Anxiety, Stress & Coping*, 22(1), 117–127. <https://doi.org/10.1080/10615800802203751>
- Vieselmeyer, J., Holguin, J., & Mezulis, A. (2017). The role of resilience and gratitude in posttraumatic stress and growth following a campus shooting. *Psychological Trauma: Theory, Research, Practice, and Policy*, 9(1), 62–69. <https://doi.org/10.1037/tra0000149>
- Walker, J., Kumar, A., & Gilovich, T. (2016). Cultivating gratitude and giving through experiential consumption. *Emotion*, 16(8), 1126–1136. <https://doi.org/10.1037/emo0000242>
- Wang, D., Wang, Y. C., & Tudge, J. R. H. (2015). Expressions of Gratitude in Children and Adolescents: Insights From China and the United States. *Journal of Cross-Cultural Psychology*, 46(8), 1039–1058. <https://doi.org/10.1177/0022022115594140>
- Waters, L. (2012). Predicting Job Satisfaction: Contributions of Individual Gratitude and Institutionalized Gratitude. *Psychology*, 3(12), 1174–1176. <https://doi.org/10.4236/psych.2012.312A173>
- Watkins, P. C., Cruz, L., Holben, H., & Kolts, R. L. (2008). Taking care of business? Grateful processing of unpleasant memories. *The Journal of Positive Psychology*, 3(2), 87–99. <https://doi.org/10.1080/17439760701760567>
- Watkins, P. C., Scheer, J., Ovnicek, M., & Kolts, R. L. (2006). The debt of gratitude: Dissociating gratitude and indebtedness. *Cognition & Emotion*, 20(2), 217–241. <https://doi.org/10.1080/02699930500172291>
- Watkins, P. C., Uher, J., & Pichinevskiy, S. (2015). Grateful recounting enhances subjective well-being: The importance of grateful processing. *The Journal of Positive Psychology*, 10(2), 91–98. <https://doi.org/10.1080/17439760.2014.927909>
- Watkins, P. C., Woodward, K., Stone, T., & Kolts, R. L. (2003). Gratitude and Happiness: Development of a Measure of Gratitude, and Relationships With Subjective Well-Being. *Social Behavior and Personality: An International Journal*, 31(5), 431–451. <https://doi.org/10.2224/sbp.2003.31.5.431>
- Weiner, B., & Graham, S. (1989). Understanding the motivational role of affect: Lifespan research from an attributional perspective. *Cognition and Emotion*, 3(4), 401–419. <https://doi.org/10.1080/02699938908412714>
- Weinstein, N., DeHaan, C. R., & Ryan, R. M. (2010). Attributing autonomous versus introjected motivation to helpers and the recipient experience: Effects on gratitude, attitudes, and well-being. *Motivation and Emotion*, 34(4), 418–431. <https://doi.org/10.1007/s11031-010-9183-8>
- White, E. J., Kraines, M. A., Tucker, R. P., Wingate, L. R. R., Wells, T. T., & Grant, D. M. M. (2017). Rumination's effect on suicide ideation through grit and gratitude: A path analysis study. *Psychiatry Research*, 251(January), 97–102. <https://doi.org/10.1016/j.psychres.2017.01.086>
- Williams, L. A., & Bartlett, M. Y. (2015). Warm Thanks : Gratitude Expression Facilitates Social Affiliation in New Relationships via Perceived Warmth. *Emotion*, 15(1), 1–5. <https://doi.org/10.1037/emo0000017>
- Wong, J., Owen, J., Gabana, N. T., Brown, J. W., Mcinnis, S., Toth, P., & Gilman, L. (2016). Does gratitude writing improve the mental health of psychotherapy clients? Evidence from a randomized controlled trial. *Psychotherapy Research*, 28(2), 192–202. <https://doi.org/10.1080/10503307.2016.1169332>
- Wood, A. M., Brown, G. D. A., & Maltby, J. (2011). Thanks, but I'm used to better: A relative rank model of gratitude. *Emotion*, 11(1), 175–180. <https://doi.org/10.1037/a0021553>
- Wood, A. M., Froh, J. J., & Geraghty, A. W. A. (2010). Gratitude and well-being: A review and theoretical integration. *Clinical Psychology Review*, 30(7), 890–905. <https://doi.org/10.1016/j.cpr.2010.03.005>
- Wood, A. M., Joseph, S., & Linley, P. A. (2007). Coping Style as a Psychological Resource of Grateful People. *Journal of Social and Clinical Psychology*, 26(9), 1076–1093. <https://doi.org/10.1521/jscp.2007.26.9.1076>
- Wood, A. M., Joseph, S., Lloyd, J., & Atkins, S. (2009). Gratitude influences sleep through the mechanism of pre-sleep cognitions. *Journal of Psychosomatic Research*, 66(1), 43–48. <https://doi.org/10.1016/j.jpsychores.2008.09.002>
- Wood, A. M., Joseph, S., & Maltby, J. (2008). Gratitude uniquely predicts satisfaction with life: Incremental validity above the domains and facets of the five factor model. *Personality and Individual Differences*, 45(1), 49–54. <https://doi.org/10.1016/j.paid.2008.02.019>
- Wood, A. M., Joseph, S., & Maltby, J. (2009). Gratitude predicts psychological well-being above the Big Five facets. *Personality and Individual Differences*, 46(4), 443–447. <https://doi.org/10.1016/j.paid.2008.11.012>
- Wood, A. M., Maltby, J., Gillett, R., Linley, P. A., & Joseph, S. (2008). The role of gratitude in the development of social support, stress, and depression: Two longitudinal studies. *Journal of Research in Personality*, 42(4), 854–871. <https://doi.org/10.1016/j.jrp.2007.11.003>
- Wood, A. M., Maltby, J., Stewart, N., & Joseph, S. (2008). Conceptualizing gratitude and appreciation as a unitary personality trait. *Personality and Individual Differences*, 44(3), 621–632. <https://doi.org/10.1016/j.paid.2007.09.028>

Wood, A. M., Maltby, J., Stewart, N., Linley, P. A., & Joseph, S. (2008). A social-cognitive model of trait and state levels of gratitude. *Emotion*, 8(2), 281–290. <https://doi.org/10.1037/1528-3542.8.2.281>

Yost-Dubrow, R., & Dunham, Y. (2017). Evidence for a relationship between trait gratitude and prosocial behaviour. *Cognition and Emotion*, 32(2), 397–403. <https://doi.org/10.1080/02699931.2017.1289153>

Yu, H., Cai, Q., Shen, B., Gao, X., & Zhou, X. (2017). Neural substrates and social consequences of interpersonal gratitude: Intention matters. *Emotion*, 17(4), 589–601. <https://doi.org/10.1037/emo0000258>

Zahn, R., Garrido, G., Moll, J., & Grafman, J. (2014). Individual differences in posterior cortical volume correlate with proneness to pride and gratitude. *Social Cognitive and Affective Neuroscience*, 9(11), 1676–1683. <https://doi.org/10.1093/scan/nst158>

Zahn, R., Moll, J., Paiva, M., Garrido, G., Krueger, F., Huey, E. D., & Grafman, J. (2009). The neural basis of human social values: Evidence from functional MRI. *Cerebral Cortex*, 19(2), 276–283. <https://doi.org/10.1093/cercor/bhn080>

Zhou, X., & Wu, X. (2016). Understanding the roles of gratitude and social support in posttraumatic growth among adolescents after Ya'an earthquake: A longitudinal study. *Personality and Individual Differences*, 101(October), 4–8. <https://doi.org/10.1016/j.paid.2016.05.033>



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